Financial security and information From Financial markets

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INTRODUCTION

In a modern economic system, when financialization, the dominance of the financial sector over real, and fictitious capital over production are the basic trends, increasing attention to ensuring the state's financial security is critically important. A prerequisite for building an effective financial security management system in Ukraine is to ensure the financial sector stability

The presence of information asymmetry, high volatility and low efficiency of the financial market necessitate the development of scientific and methodological tools for the assessment and analysis of information from financial markets.

The crucial importance of early prediction of crisis phenomena in the financial sector in order to ensure its stability, the development of methodological tools for regulating market failures led to the choice of the problem under investigation. In addition, among 62 reforms defined by the Strategy for Sustainable Development of Ukraine 2020, one of the most important is the reform of the financial sector and the reform of the capital market. They form the basis for strengthening Ukraine's financial security and integrate it with the global initiatives of the World Bank and the International Monetary Fund to strengthen the financial sectors all over the world.

The absence of an integrated strategy for managing financial security in Ukraine has a strict impact to the mechanisms of broadcasting financial markets crashes and threats to financial stability and security at the national and global levels. At the same time, use of information from financial markets as results of their modeling and forecasting is insufficiently developed in both practical and purely academic aspects. But this

information is a cornerstone for providing financial sector stability and a reliable basis for state's financial security.

The urgency of the study is connected with the creation of an informational and analytical space for the adoption of scientifically based solutions for the management of state's financial security. This space is based on a synergistic combination of economic and mathematical models for the analysis and forecasting of financial markets and instruments for regulating financial sector stability.

The use of data from financial markets (dynamics of prices for financial assets, volatility of financial markets, results of forecasting prices in financial markets) makes them unique as an information basis for ensuring financial stability and security of the state.

The purpose of the study is to develop methodological approaches and scientific and methodical tools for modeling and forecasting behavior of financial markets that will enable the formation of an informational field for scientifically grounded financial security management of the state through transmission channels to increase the stability of its financial sector. The stated purpose causes the following tasks to be solved:

– to study the essence and peculiarities of the process of financial security management of the state and to investigate the current state of financial security of Ukraine;

– to determine the peculiarities of functioning of the financial markets of Ukraine and the world in modern conditions;

– to study and compare the basic concepts that explain the formation and dissemination of information, its asymmetry in the financial markets in terms of market segments, market instruments (underlying financial instruments and their derivatives); their price parameters (volatility, informational asymmetry, moral risks);

– to identify current determinants of financial sector stability;

– to substantiate the role of the state in the implementation of financial supervision as a basis for ensuring the stability of the financial sector.

Issues covered in the monograph are addressed to a wide range of specialists: representatives of financial supervisory bodies, regulation and management of financial security of the state and the stability of its financial sector, participants in financial markets, teachers of higher education institution, students and postgraduate students.

The monograph was performed within the framework of the research theme "Modeling and forecasting the behavior of financial markets as information base for ensuring the financial stability and security of the state" (state registration number No. 0117U003936), which is financed by the State budget of Ukraine and was prepared by a team of authors:

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1. MANAGING THE STATE FINANCIAL SECURITY AND THE FINANCIAL SECTOR STABILITY: THE ROLE OF MODERN INFORMATION CONCEPTS OF FINANCIAL MARKETS' BEHAVIOR

1.1. The essence and features of the state financial security management process

Constant increasing of financial system's role and importance is becoming a salient characteristic of the modern development of the domestic economy. The financial system has a dynamic and multiple-aspect structure of detached but at the same time interconnected spheres and elements of finance. This system provides an uninterrupted process of national product formation and promotes economic growth in the country. The functioning of the financial services market and activity of the financial intermediaries on it play a leading role in this process. They are a powerful element to connect the financial system subjects and real sector of the economy. Under the conditions of the domestic economy restructuring the financial institutions provide monetary settlements, but also accumulate free savings and transform them into investment resources for extended reproduction of the economy, focus their activity on profit-making and satisfaction of subjects" needs for financial services and thus ensure sustainable economic growth. Given the undeniable importance of finance in the processes of the state's economy functioning, the issue of financial security ensuring and effective financial security management becomes especially relevant.

First of all, when investigating financial security, it is important to study out the gist of this term and the factors which influence financial security compliance, define the components of security and the aspects of their interrelation and coordination.

The scientific works analysis confirms that financial security is a constituent of economic security. At the same time, economic security is a guarantee of national security as a capability of nation in general and state authorities in particular to prevent and counteract any kinds of internal and external threats in order to save territorial integrity and independent development of the state, but also as a possibility to protect interests of the nation, society and state in order to augment spiritual and material values.

Despite the obviousness of the term economic security, there is no common point of view regarding the interpretation of this term in a scientific society. It is a result of different approaches to the definition of economic security's object. Thus, economic security as a certain state of vital protection of interests from internal and external threats is determined by A. Horodetskyi [86], K. Ippolitov [87] and V. Savin [88]. The concept of economic security of Ukraine contains a broader interpretation of economic security and defines it as "the state of the economy, society and institutes of state power when the realization and guaranteed protection of national economic interests, progressive socio-economic development of Ukraine, sufficient defense potential are provided even under the conditions of unfavorable internal and external processes.

In the scientific works of O. Lepikhov [90], E. Bukhvald [91], M. Yermoshenko [92] economic security is considered as a tool (mechanism) to prevent and eliminate threats to system's stability ensuring, to protect the state from socio-political explosions on the basis of the national economic interests implementation, sustainable and efficient development of the domestic economy.

The understanding of the economic security from a perspective of the economy's ability to provide realization of needs, the formation of conditions and factors for a continuous

upgrade, self-improvement, and development is inherent to L. I. Abalkin [93], V. Tambovtsev [94].

So, the presence of internal and external threats and the dynamism of the country's economic system which allows responding on them effectively and creating new development points are the key elements which define economic security of the country. It is only possible to ensure this if economic independence and economic self-development are possible. It is possible to ensure this only upon the availability of economic independence and economic self-development ability.

Taking into account the existence of different approaches to the interpretation of the economic security's essence, it is evident that there are different approaches to the components of this category. Thus, almost all the components of national security are often referred to economic security, for example: resource security, energy security, financial security, security of the financial and credit sphere, military and economic security, technological security, food security, agrarian security, demographic security, ecological security, industrial and technological security, social security, privatization security, foreign economic security, drinking water security, price security, financial and monetary security, political security, criminal security, medical security, labor resource security, etc.

In the context of a broad economic security understanding, we agree with the opinion of M. M. Yermoshenko and K. S. Horiacheva [92] that we should refer to economic security only those its elements which contain only economic relations or are based on them. That's why it is expedient to include into the category "economic security of the state" only financial, macroeconomic, intra-economic or industrial, foreign economic and socio-economic constituents. The issues of financial security are systemic because they link individual

countries, regions, business entities, politics, economy, finances, etc. [95, 96].

The scientific elaboration degree of each of the listed areas of a financial security application is different. That's why the analysis of approaches to the definition and interpretation of its essence by different scientists is expedient.

Thus, I. F. Shlemko determines financial security as the state of financial, monetary, currency, banking, budget and tax systems which are characterized by a balance, resistance to internal and external negative influences, the ability to ensure the effective functioning of the national economic system and its growth [97]. S. Kulpinskyi has a similar point of view and defines financial security as a purposeful set of activities of fiscal and monetary policy in order to achieve the financial system stability and create a favorable investment climate [98].

Thereby the main goals of financial security functioning are the following ones:

– achievement of a certain balanced and resistant to internal and external negative effects state by the subject;

– ensuring the efficient functioning of the economic system.

Financial security issues are also reflected in regulatory documents. So, in the Methodology for calculating the level of economic security of Ukraine of 02.03.2007 the financial security is defined as a state of budget, monetary, banking and currency systems and financial markets, which is characterized by a balance, resilience to internal and external negative threats, the ability to ensure the effective functioning of the national economic system and economic growth [99]. Instead, in the Methodological recommendations on calculation of the level of economic security of Ukraine of 29.10.2013, financial security is a state of country's financial system when the necessary financial conditions for a stable socio-economic development of the country are created, its resilience to

financial shocks and imbalances is provided, the conditions to preserve the integrity and unity of the financial system of the country are created [99].

Colligation of scientific approaches to the understanding of the state's financial security allowed distinguishing the main characteristics which are considered by scientists to reflect the meaning of the term. Among these main characteristics are the following ones:

– balance, resistance to threats, capability, and effectiveness of the national economic and financial system functioning (V. I. Muntiian [101], M. M. Yermoshenko [102], A. I. Sukhorukov [103], O. D. Ladiuk [104], S. M. Smyrnov [105]);

– security, financial resources availability (V. M. Heiets [89], E. V. Dmytrenko [106], O. I. Baranovskyi [107], Z. S. Varnalii [108]);

– extended reproduction and promoting economic growth (O. D. Vasylyk);

– integrity and unity of the financial system (B. V. Hubin [91]);

– the ability to ensure the effective functioning of the national economic system (B.V. Hubskyi [109]);

According to the Concept of financial security of Ukraine worked out by O. I. Baranovskyi, Yu. O.Blashchuk, M. I. Puziak, L. V. Novoshynska, O. O. Reznikova, O. V. Romanchenko, F. F. Stasiuk., V. V. Feshchenko, the following spheres of influence of the state's financial security are the main ones [95]:

– budget sphere and state regulation of financial markets;
– monetary and credit sphere;
– insurance;
– non-bank financial services;
– stock market.

It is worth mentioning, that financial security by its nature and content is a complex multi-level dynamic process consisted of a number of subsystems and each of them has its own structure and development logic.

Taking into account the crucial importance of financial security in the context of providing both economic and national security, which is directly related to the protection of national and financial interests of the country, issues of effective management of the financial security system become especially relevant.

According to such domestic scientists as S. M. Kolodiziev and A. V. Seredina financial security management system is formed according to the purpose, strategies, and tasks and it must include the controller (the subject of control) and the controlled (object control) subsystem with the fulfillment of their respective functions. Thus, the system of the state's financial security management should contain the following elements [92]:

– the main purpose and objectives of the state's financial security ensuring;

– subjects and objects of the state's financial security;

– principles and functions of the state's financial security management system;

– methods of financial security ensuring;

– national interests in the financial and credit sphere;

– real and potential threats to the state's financial security;

– priorities in financial security ensuring;

– system of maintaining security in the financial and credit sector (main functions, the organizational structure of the system, the list of indicators, monitoring subsystem, subsystem of analytical and forecast support, powers of the main subjects of the financial security system);

– availability of the state strategy of financial security and its structure.

The purpose of the state's financial security is to maintain the steady state of the financial and credit sphere taking into account the prospects of economic growth.

The subjects of the state's financial security management system are [86,92,110,111]: the President of Ukraine, Verkhovna Rada of Ukraine, Cabinet of Ministers of Ukraine, National Security and Defense Council of Ukraine, Ministries and other central executive authorities, National Bank of Ukraine, National Commission for State Regulation of Financial Services Markets, National Securities and Stock Market Commission, general jurisdiction courts, public prosecutor's office of Ukraine, local state administrations and local governments, Security Service of Ukraine, State Fiscal Service of Ukraine.

In the opinion of O. I. Revak and V. Yu. Prokopenko [112] the financial interests of the state, threats to the state's financial security [113], financial resources of the state; the financial system of the state as a combination of spheres and branches of finance, financial market, and securities market are the objects of financial security.

Effectiveness of measures to ensure the state's financial security requires the principles of financial security management defining. There are both general and specific principles among them [92, 114].

The essence of the main functions of the state's financial security management system follows from the goal, principles, basic methods of financial security ensuring and its priorities. According to M. M. Yermoshenko and K. S. Horiacheva [92] the list of the main functions should include the following ones:

– the creation of the state's financial security management system and its constant maintenance in proper condition;

– the provision of activity of the state's financial security management system;

– the identification of a set of criteria for the financial and credit sector which meet the requirements of its security , and of threshold values for financial security indicators;

– the realization of the management system perspective activity (prognostication, detection, and evaluation of possible threats, destabilizing factors, the reasons for their occurrence as well as the consequences of their manifestation);

– the participation in international financial security systems.

Ensuring fulfillment of functions of the state's financial security management system requires the creation of appropriate infrastructure with defined subject competences of state bodies as well as non-governmental, public and international organizations. It is also important to include the availability of appropriate legal and regulatory framework – "financial laws" – into the infrastructure provision of the state's financial security management system [115]. Financial laws include the following ones: complex (intersectoral) laws (for example, the Laws of Ukraine On Local Self-Government in Ukraine, On Banks and Banking Activity, On Financial Restructuring, etc.) and purely financial laws [115] (for instance, the Budget Code of Ukraine, the Tax Code of Ukraine, the Laws of Ukraine On Financial Services and State Regulation of Financial Services Markets and other).

In the scientists" opinion [116, 117, 118, 114,] the mechanism of implementation of the state's financial security management system should be realized on the basis of scientifically grounded concept, strategy and tactics, adequate financial policy, objects defining, the availability of necessary security institutions, interests defining and concretizing, threats systematization, applying means, ways and methods of security provision and should be based on objective and comprehensive monitoring of economy and financial sphere, on calculation of threshold and maximum permissible values of financial and

socio-economic indicators (their exceeding can cause financial instability and financial crisis).

So, financial security is an integrant component of economic security and a guarantee of national security which is expressed in a certain state of financial flows within the financial, monetary, currency, banking, fiscal, accounting, investment and stock systems of the country. They are characterized by balance, resistance to internal and external negative influences, ability to avert the external financial expansion, provide financial stability, effective functioning of the national economic system and economic growth in general.

Effectiveness of measures to ensure the state's financial security requires the designation of the state's financial security management system. This system has the following obligatory elements: the purpose and objectives of the state's financial security ensuring; the subjects and objects of the state's financial security; the principles and functions of the state's financial security management system; methods of financial security providing.

1.2. Scientific and methodical approach to assessing the level of financial security in Ukraine

An assessment of the state's financial security level is an important element of financial security management and provision.

For today the following official methodological recommendations have been developed in Ukraine: economic security system of the National Institute for International Security Problems under the NSDC of Ukraine and calculation of Ukraine's economic security level of Ministry of Economy of Ukraine. They are one way or another related to the comprehensive assessment of financial security.

In order to determine financial security the specialists of the National Institute for International Security Problems under the NSDC of Ukraine offer to use the following indicators: the level of economy's monetization; the level of external debt to GDP ratio; the level of domestic debt to GDP ratio; the level of gross international reserves of the National Bank of Ukraine (in the months of import); the level of GDP redistribution through the consolidated budget (consolidated budget revenues to GDP ratio); the level of budget deficit to GDP ratio; the level of transfers from the state budget to GDP ratio; the level of consolidated budget expenditures to average annual population ratio; the level of lost budget revenues caused by shadowing (as a percentage to GDP); annual inflation growth; average annual value of bank loans; the volume of lending to the real sector of the economy to GDP; the share of loans to the processing industry in lending to the economy [119].

The methodical recommendations of the Ministry of Economy of Ukraine contain the information about the following elements of financial security: banking security, the security of the non-banking financial sector, debt security, budget security, currency security and monetary security [99]. In general, we agree with such a structure of financial security and suggest considering indicators, used to evaluate the components of financial security, in more detail.

The representatives of the Ministry of Economy of Ukraine estimate banking security using the following indicators: the share of overdue loans arrears in the total amount of loans given by banks to the residents of Ukraine; the ratio of loans and deposits in foreign currency; the share of foreign capital in authorized capital of banks; the ratio of long-term (over 1 year) credits and deposits; return on assets; the ratio of liquid assets to short-term liabilities; the share of assets of the five largest banks in the total assets of the banking system [99]. The scientific works of O. I. Baranovskyi [107, p. 21-24],

M. I. Krupko [120, p. 170-171], Z. S. Pestovska [121] are focused on studying measurement problems and the main indicators of banking security.

The Ministry of Economy of Ukraine offers to evaluate the security of the non-banking financial sector with the use of the following indicators: insurance penetration rate (insurance premiums to GDP ratio), the level of listed companies capitalization to GDP, PFTS index volatility level, the share of insurance premium receipts of the three largest insurance companies in the total amount of premiums [99]. We think that this list of indicators of the non-banking financial sector security should include not only the functioning indicators of insurance and securities markets but also the indicators of non-state pension funds, pawnbrokers and other non-bank financial intermediaries. It is also worth saying that there are almost no researches in the aspect of the financial security of the non-banking financial sector in Ukraine. The insurance is more developed activity than other types of non-bank financial intermediation in Ukraine, that's why the researches are mostly focused on the security of insurance activity or insurance market. The scientific works of O. S. Zhuravka [37], A. M. Yermoshenko [38], O. Y. Zhabynets [39], O. M. Zaiets [40], L. O. Pozdniakova [41], V. M. Furman [42] and N. V. Zachosova [42] are focused on these issues.

It is worth mentioning, that more and more domestic scientists recommend relying on the approaches of the World Bank and IMF while exploring and evaluating the debt security [128; 129; 130].

According to the Mineconomy of Ukraine specialists' vision the budget security can be estimated using the following indicators: the ratio of the state budget deficit / surplus to GDP, the ratio of deficit / surplus of budgetary and extrabudgetary funds of the general government sector to GDP, the level of GDP redistribution through the consolidated budget, the ratio

of the volume of aggregate debt service payments and payments on public debt repayment to state budget revenues. In our opinion, within this direction, it is important to take into account some indicators of the budget revenue part formation, in particular, the share of tax and non-tax revenues in the total amount of budget revenues.

According to the approach of the Mineconomy of Ukraine the currency security can be demonstrated by the following indicators: change index of exchange rate of the hryvnia against the U.S. dollar, between the forward and the official course, the difference between the forward and the official exchange rates, gross international reserves expressed in months of import, the share of foreign currency credits in the total amount of given credits, balance of foreign currency buying and selling by the population, the level of the money supply dollarization [99].

According to the above-mentioned methodological instructions, the monetary security can be estimated on the basis of the following indicators: the specific weight of cash outside the banks in the money supply; the distinction between the interest rates on loans given by deposit corporations and the interest rates on deposits attracted by depository institutions, etc. In the national science, the researches of both currency security and monetary security are based on the list of indicators defined by the Ministry of Economy of Ukraine or on a narrower set of indicators [131, 132, 133, 134, 135].

Taking into account the executed critical analysis of existing scientific and methodological approaches to the evaluation of the state's financial security and the peculiarities of information support of domestic financial statistics we suggest using the following indicators for the components of the state's financial security:

– banking security – the share of problematic debt in the amount of loans given to residents; the ratio of bank loans and

deposits in foreign currency; the share of foreign capital in the authorized capital of banks; the share of assets of the five largest banks; the ratio of liabilities and liquid assets; a standard of the maximum size of credit risk per one counterparty;

– the non-bank financial sector security – the share of gross insurance premiums of the first three insurers; the inverse indicator to the share of listed stock market companies capitalization in GDP; PFTS index volatility; the share of premiums which belong to non-resident reinsurers;

– debt security – the ratio of public debt and state-guaranteed debt to GDP; the ratio of the gross external debt volume to GDP; the average weighted government bonds returns on the primary market; index EMBI+Ukraine; the ratio of the official international reserves volume to the gross external debt volume;

– budget security – the ratio of the state budget deficit / surplus to GDP; the ratio of deficit / surplus of budgetary and extrabudgetary funds of the general government sector to GDP; the level of GDP redistribution through the consolidated budget; the ratio of the volume of aggregate debt service payments and payments on public debt repayment to the state budget revenues;

– currency security – the change index of the official exchange rate of the national monetary unit against the U.S. dollar; gross international reserves; the foreign currency credits in the total amount of credits; the level of the money supply dollarization;

– monetary security – the specific weight of cash in the money supply; the consumer price index; the specific weight of short term loans up to 1 year in the total amount of loans; the specific weight of loans, given to the general government sector and other sectors of the economy, in the total amount of loans; the volume of financial resources export outside the

country; the distinction between the interest rate on new loans, given to residents by the deposit corporations (except NBU) in national currency, and the consumer price index.

Taking into account the complex nature of the state's financial security, we think that it is expedient to create an integrated assessment for each component of financial security. This process contains several stages:

– selection of indicators and their normalization;

– finding the coordinates of the vector-standard;

– defining the distances between the vector-standard and vector of each period values on the basis of the Euclidean distance calculation;

– calculating the integral indicator for each financial security component – banking security, the security of the non-banking financial sector, debt security, budget security, currency security, and monetary security;

– generalizing assessment of the state's financial security and analytical interpretation of the results.

In order to bring indicators to a single range of values, we have chosen a method z – the normalization of values which allows the transition of x_{it} to normalized z_{it}:

$$z_{it} = \frac{x_{it} - \bar{x}}{\sigma_x}, \qquad (1.1)$$

where

$\bar{x}$ – the arithmetic mean of the corresponding feature for the entire researched period;

σ_x – mean square deviation of the feature for the entire researched period.

There was a loss of information on the qualitative characteristics of the studied features in the process of normalization. That"s why taking into account the influence of

the normalized values of indicators on one area or another, it is necessary to construct a point-standard $S' = (s_1, s_2, s_3, ..., s_n)$ from the normalized values of indicators. Considering the fact, that growing or increasing of the indicators reduces the level of one or another financial security area, we define the coordinates of this point using the formula (1.2):

$$s_i = \min_{t=1 \div t} \{z_{it}\} \quad (1.2)$$

At the next step, we determine the distances l_t between this point $S' = (s_1, s_2, s_3, ..., s_n)$ and every point $S = (s_{1t}, s_{2t}, s_{3t}, ..., s_{nt})$ for each period t. We use the most common statistical method – the calculation of the Euclidean distance:

$$l_t = \sqrt{(s_{1t} - s_1)^2 + (s_{2t} - s_2)^2 + (s_{2t} - s_3)^2 + ... + (s_{it} - s_n)^2} \quad (1.3)$$

On the basis of the obtained Euclidean distance values we define an integral indicator for each component of financial security FS_i – in particular, banking security FS_{BN}, security of the non-banking financial sector FS_{NBN}, debt security FS_D, budget security FS_{BD}, currency security FS_C, and monetary security FS_{MCR}:

$$FS_i = 1 - \frac{l_t}{\bar{l} + m \times \sigma_l} \quad (1.4)$$

where

$\bar{l}$ – the arithmetic mean of the Euclidean distance for the entire researched period;

σ_x – mean square deviation of the Euclidean distance for the entire researched period;

m – some positive number, which is chosen to be equal to 2 or 3 so that the value IFS for each component of the state's financial security was in the interval $(0;1)$.

In order to get a generalizing evaluation of the state's financial security level we apply the formula based on the calculation of the geometric mean by the following formula (1.5):

$$IFS = \sqrt[6]{FS_{BN} \times FS_{NBN} \times FS_D \times FS_{BD} \times FS_C \times FS_{MCR}} \qquad (1.5)$$

The calculation of FS_{BN}, FS_{NBN}, FS_D, FS_{BD}, FS_C, FS_{MCR} and IFS is built so that their values are within the interval $[0;1]$. Given this we can rank the level of financial security for each component and in general for the following degrees – high, satisfactory, medium, unsatisfactory and low (Tab. 1.1).

Table 1.1. Analytical interpretation of the values of the integral state's financial security indicators

Interval of FS_{BN}, FS_{NBN}, FS_D, FS_{BD}, FS_C, FS_{MCR} and IFS values	Security level
$[0{,}85;1{,}00]$	high
$[0{,}60;0{,}80)$	satisfactory
$[0{,}40;0{,}60)$	medium
$[0{,}15;0{,}40)$	unsatisfactory
$[0;0{,}15)$	low

On the basis of collected analytical material, we have determined the integral indicators for each component of financial security FS_i – in particular, banking security FS_{BN}, security of the non-banking financial sector FS_{NBN}, debt security FS_D, budget security FS_{BD}, currency security FS_C, and monetary security FS_{MCR} (Tab. 1.2).

Table 1.2. Integral indicators of the level of financial security of Ukraine and its elements in 2005-2016

Element	Year											
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Banking security	0.57	0.52	0.25	0.26	0.49	0.43	0.45	0.53	0.40	0.38	0.32	0.11
Security of the non-banking financial sector	0.87	0.90	0.72	0.55	0.79	0.68	0.61	0.82	0.80	0.21	0.54	0.26
Debt security	0.52	0.61	0.63	0.63	0.58	0.58	0.65	0.58	0.56	0.44	0.27	0.06
Budget security	0.36	0.33	0.43	0.45	0.47	0.45	0.41	0.21	0.20	0.15	0.44	0.20
Currency security	0.71	0.54	0.44	0.24	0.31	0.38	0.43	0.48	0.70	0.43	0.22	0.42
Monetary security	0.32	0.37	0.31	0.23	0.17	0.13	0.28	0.25	0.23	0.34	0.09	0.36
Financial security	0.52	0.52	0.43	0.36	0.42	0.40	0.45	0.43	0.42	0.30	0.27	0.19

The banking security level was unsatisfactory in 2007-2008 and 2014-2015, and in 2016 it was extremely low. In the non-banking financial sector the high level of security was provided in 2005-2006 and 2012-2013, satisfactory level – in 2007 and 2009-2011, medium level – in 2008 and 2015, unsatisfactory level – in 2014 and 2016. The level of debt security can be determined as a medium in 2005, 2009-2010, 2012-2014 and

as satisfactory in 2006-2008 and 2011. In 2015 and 2016 the level of a debt security of Ukraine substantially decreased – to unsatisfactory and low levels, respectively.

The budget security of Ukraine was not very high during the investigated period. There wasn't even a satisfactory level in any of the years. In 2005-2006, 2012-2013, 2014 and 2016 the budget security level was unsatisfactory.

The level of currency security was satisfactory only in 2005 and 2013, while in 2008-2010 and 2015 it was unsatisfactory. For the rest of the years – 2006-2007, 2011-2012 and 2014 – currency security demonstrated a medium level.

The situation with monetary security can be considered critical. Its integral indicator has never exceeded the mark of 0.4 over the investigated period that is, the monetary security has not reached even the medium level. In 2010 and 2015 the level of monetary security has been identified as low.

As we can see, in Ukraine the level of financial security was medium in 2005-2007 and 2009-2013, while in 2008 and 2014-2016 it was unsatisfactory. So, there was a significant deterioration in the financial security of Ukraine in general and for each of its elements in 2005-2017.

1.3. The management of the state's financial sector stability, financial security using the information from the financial markets

The information subsystem is an important element of the country's financial security management system. The provision of opportune and adequate information is a necessary guarantee for making decisions in the process of the country's financial security management [136].

As a rule, in this case, the statistical data on the state of a particular economic activity sector (inflation data, labor market statistics, data on the state of industrial production and GDP,

etc.) is used. In addition, it is expedient to use different rating indicators for expert generalization of information on certain aspects. The availability of significant data volumes complicates their search and processing. Besides, the information mentioned above is characterized by a basic disadvantage, which is critical from the standpoint of modernity – time. The statistics are published quarterly or at best once a month. Usually, the ratings published by international organizations are updated once a year. This makes operational management of the country's financial security and quick response to certain information signals from the economic system impossible. It is worth saying, that a number of economic indicators have inertia. They generate signals that are more relevant to the past state of the system than the current one.

Most of the disadvantages listed above can be successfully overcome if we implement the information on the dynamics of financial assets prices into the decision making process. This information is unique in terms of an entire number of features: not only the key economic relations players but also the best analysts and experts take part in the process of its formation; the financial assets prices virtually aggregate all the information available on the market (economic information as well as political information and information from the other spheres of social activity); the financial assets prices form on a real-time basis, that is there are no time lags between the signal generated from the side of the economy and its reflection [137].

The financial assets prices can be generated both in the process of stock exchange activity and on the over-the-counter (OTC) markets.

The sites of stock exchanges and appropriate financial intermediaries (brokers, dealers, etc.), specialized terminals and trading systems, news agencies (Bloomberg, Reuters, etc.),

different newsletters and publications in mass media may serve as sources of such information.

The information on the prices in the financial markets is quite multidimensional. In addition to purely prices and their dynamics (moreover, in different dimensions: from the position of time intervals – daily, intraday data; from the position of their price parameters – opening, closing, maximum and minimum prices during the analyzed period) it also contains data on the volumes of trades, the liquidity of a certain asset. Besides, data may be presented in aggregated form, for example, in the form of stock indices. The aggregated information is very important because individual financial assets give an insight mostly into their own specifics and can be exposed to their own unique factors. Thereby they generate false signals about the state of the economic system in general. Using aggregated data (for example, in the form of stock indices, dollar index, commodity price index, etc.) give us the opportunity to generalize and average the information on individual assets. In such a way we can level individual factors of influence and underline general macroeconomic factors and trends.

Another important characteristic of the dynamics of financial assets prices is volatility, that is, the amplitude of price fluctuations over a certain period. It can be used both for analyzing the state of a particular financial market and the economic system of the country in general. As a rule, volatility growth evidences the increase in the uncertainty of financial markets participants in the future and can act as an indicator of the crisis onset [138]. That is, the market volatility is an important indicator of the economic system state and it must be taken into account in the process of the country's financial security management.

The financial assets prices give an opportunity to predict the onset of crisis phenomena in the economy. For example, the emergence of price bubbles is one of the clear signals.

The financial markets also allow evaluating the emotional component of the economic system participants. It is very important, because, for example, the prediction of panic wave emergence helps to predict certain crisis phenomena in the economy and prepare for them. The VIX index (so-called Fear Index) or Fear and Greed Index published by CNN Money are the examples of such data.

The data on financial assets price dynamics can become a basis for evaluating and reducing the level of information asymmetry in the economy. For instance, the research of the market microstructure (price spreads) allows indirect determination of the information asymmetry level concerning one or another financial asset. In particular, spread growth indicates an increase in information asymmetry. In this case, the explanation is quite simple: market makers try to shirk off the uncertainty risks upon the traders (investors). They ensure against potential losses caused by trade with informed traders, who will try to use their information advantage [54].

Thus, financial assets prices are a unique source of information from the position of quality, the speed of obtaining and the variety of manifestations. Incorporation of this source into the state's financial security management system will allow raising the quality of informational and analytical support of the decision-making process. Besides, exploring the predictive potential of financial assets prices in the context of the state's financial security management process is also a promising research area.

2. THE INFORMATION ASYMMETRY ON FINANCIAL MARKETS AND ITS IMPACT ON FINANCIAL STABILITY MANAGEMENT AND SECURITY OF THE STATE

2.1. A comparative analysis of the main concepts of financial market behavior, dissemination of information and its asymmetry in the financial sector

At the moment, there is no single approach to explaining the behavior of financial markets. Existing concepts contradict each other and are based on different assumptions. For a long period of time, the dominant theory was the hypothesis of an efficient market. Fama (1965) emphasizes that an efficient market is a market in which, due to the availability of information, the market value of an asset corresponds to its internal value [55]. But a significant number of contradictions to this in real life led to the emergence of alternative concepts, in particular, so-called behavioral theory of financial markets. Behavioral finances deny the rationality in the behavior of investors (which is the basic precondition of the hypothesis of an efficient market) and give a number of empirical evidence of this.

For example, De Bond and Thaler (1985) shown that investors overestimate current information and underestimate historical data [56]. As a result, financial markets show an overreaction or do not enough react to the investor's actions. Black (1985) introduced the concept of noise traders - irrational investors who make decisions based on the "noise", which is present in the financial markets [57]. Due to this, prices for financial assets deviate from their real value.

Idziri et al. (1966) argue that they found another reason for irrationality is a behavioral response to a known stimulus (so-called functional fixation) [58]. Mandelbrot (1972) shown that

pricing in financial markets is not a random process, but has signs of follow-up to certain long-term trends. The systematization of these theories and concepts of other researchers is the purpose of the study [59].

For a long period of time, the hypothesis of an efficient market was a dominant ideology that explained the behavior of financial markets. But a significant number of inconsistencies between theory and practice led to the emergence of alternative concepts and theories: the Adaptive Market Hypothesis, the Overreaction Hypothesis, the Underreaction Hypothesis, the Noise Market Hypothesis, the Functional Fixation Hypothesis, the Fractal Market Hypothesis, etc.

1. The Adaptive Market Hypothesis. Andrew Lo (2004), trying to reconcile the hypothesis of an effective market with behavioral finance, introduced an entirely new concept, which he called the Adaptive Market Hypothesis. The basic idea behind this hypothesis is to apply the principles of evolution (competition, natural selection, adaptation, propagation, etc.) to financial markets [60].

This idea is conforming to the real trading conditions in the financial markets. They do not have a trading strategy, which would be able to generate profits on an ongoing basis, as financial markets are constantly changing. For example, internet trading has radically changed the characteristics of bidding. That is why investors should be constantly looking for changes. They should evolve.

An evolutionary approach to explaining economic behavior is not new. For example, Wilson (1975) systematically applied the principles of competition, reproduction and natural selection to social interactions [61]. Niderhoffer (1997) used the theory of evolution to explain the behavior of financial markets [62]. Luo (1998) investigated the effects of natural selection on futures markets [63], Nile et al. (2009) considered the evolution of the international currency market [65].

The main assumptions of the Adaptive Market Hypothesis are as follows:

- Individuals act according to their own interests;
- Individuals make mistakes;
- Individuals study and adapt;
- Competition is the driver of adaptation and innovation;
- Natural selection forms the market environment;
- Evolution determines market dynamics.

The Adaptive Market Hypothesis still needs more thorough research in order to claim for the role of an alternative to the hypothesis of an efficient market. It needs additional information and relevant data to measure the evolutionary dynamics of financial markets and the behavior of investors, depending on the time period and the specific circumstances. Nevertheless, this hypothesis helps to build a bridge between the hypothesis of an effective market and behavioral finance, explaining various anomalies of the hypothesis of an effective market, without rejecting the hypothesis itself.

2. The Fractal Market Hypothesis. One of the assumptions of an Efficient market hypothesis is the coincidence of price fluctuations and the lack of memory in price movements. But there is sufficient evidence that financial timelines are sustainable and have short and long-term memory. Mandelbrot (1972) was the first who noted such features inherent in financial markets [59]. Later, Greene and Filitz (1977) found long-term relationships in stock prices on the New York Stock Exchange [66]. Booth, Kaen and Kovesos (1982) also noted that certain series of quotes of financial assets have long-term memory [67]. Helms et al. (1984) found that relevant behavior is demonstrated by futures prices [68]. As a result, Peters (1991, 1994) proposed an alternative nonlinear concept of financial markets, which he called the Fractal Market Hypothesis. The basic assumption of this hypothesis is the concept of fractals (presence of templates in price movements)

and the existence of different investment horizons (some investors make decisions based on short-term strategies, others - on long-term ones) [69, 70].

According to the Fractal Market Hypothesis, one of the key characteristics of the financial time series is their persistence that is a state that continues to exist even after the disappearance of the reasons that triggered it. This means that prices cannot be accidental and trends are typical characteristics of financial time series.

3. The Overreaction Hypothesis. Market overreactions were first identified by De Bondt and Thaler (1985) [56]. Researchers argued that investors overestimate current information and underestimate past information. As a result, there is an anomaly: portfolios with the worst (best) dynamics over the last three years tend to show better (worse) results in the next three years. This anomaly has become the reason for the hypothesis of overreaction.

Overreactions were also found on stock markets in other countries, including Spain, Canada, Australia, Japan, Brazil, China, Greece, Turkey, and Ukraine (see Mynhardt and Plastun, 2013) [71]. There is evidence of overreaction on other markets, such as the gold market, the options market.

The most actual research of this hypothesis was carried out in the work of Caporal et al. (2017), which analyzed various financial markets (FOREX, stock market, raw materials market) [73].

4. The Underreaction Hypothesis. In practice, investors may not respond adequately to current events, which are happening at the moment, carry out operations only over time. This is the case with positive autocorrelation in the short term and received the name hypothesis of underreaction.

The first empirical evidence of underreactions was provided by Cutler et al. (1991). They found that stocks with high unexpected revenues give an opportunity to get higher

profitability in the period after the announcement of such revenues. This means that the market did not react to the news, which did not lead to a price movement [74].

Schlaeffer (2000) notices that the key aspect that causes underreaction is that investors generally (but not always) believe that revenues are more stationary (stable over time) than they actually are [75].

The most well-known study on the hypothesis of underreaction was conducted by Dzhagadish and Titman (1993) who found evidence of a more than six-month time horizon, in which the yield of shares had positive auto-correlation [75].

One of the possible reasons for underreaction is conservatism. This means that investors have a certain vision of the company (or financial assets). When new information appears, they prefer to respond according to their own considerations. Another purely psychological reason for underreaction is the effect of representativeness, which means investors see certain trends in random processes. For example, investors can believe that company revenue is more stable than they actually are (see Schleifer, 2000) [75].

Another reason for underreaction is the existence of different types of investors. Some of them make decisions based on fundamental analysis, others from technical analysis. Some can use short-term strategies, others are long-term. As a result, various investment decisions are made for the same information.

Consequently, the existence of underreaction indicates gaps in market efficiency, which allow for additional profits (contradicting the provisions of the hypothesis of an efficient market).

5. The Noise Market Hypothesis. The concept of noise trading was proposed by Black (1985). There are investors who sell financial assets based on the available information (rational

investors) and also sellers using noise (so-called noise traders) in the financial markets, [57]. Schleifer and Summers (1990) developed this concept. According to their opinion, the noise traders are not completely rational and their decisions are based on their own preferences and mood [77].

Noise traders are important to the market because they provide the necessary market liquidity. As a rule, the effect of noise trading is short-term. Nevertheless, it can cause excessive price volatility. Sometimes, when the number of noise traders is significant and their actions are unidirectional, price bubbles may appear on the market. Their effect, in this case, will be long-term.

Siegel (2006) has expanded the classification of market participants, based on the peculiarities of their investment decisions. In particular, he distributes them to speculators, moment traders, hedgers, insiders, institutional investors, banks with their clients. Each of these participants has its own target marks, which are based on approaches to diversification, asset management strategy, tax optimization, speculation, liquidity, etc. [78].

Thus, the influence of a significant number of market participants on the price of assets is diverse, so in certain periods prices may deviate from their fundamental values. This hypothesis is called the noise hypothesis of the market.

The noise hypothesis of the market is able to explain such anomalies of the hypothesis of an effective market as an anomaly of size, volume, overreaction, and underreaction.

The result of the development of the market's noise hypothesis is the concept of a fundamental index investment strategy instead of the standard strategy of capitalized investment portfolios recommended by the hypothesis of an efficient market.

6. The Functional Fixation Hypothesis. Another psychological aspect that can affect the behavior of investors is

the habit. Their result is the inability of investors to change the decision-making process even when the conditions of the situation have changed. In academic literature, such cases (typical reaction to a known situation) are called "functional fixation". For the first time, this phenomenon was fixed by Igiri et al. (1966) [58].

Functional fixation can occur at all stages of the decision-making process, from collecting and processing information and completing the final decision. More details about this can be found in the work of Ghana et al. (2009) [19].

Igiri (1967) summed up the main causes of functional fixation:

- lack of knowledge about changes in accounting methods;
- lack of timely feedback that would allow individuals to make conclusions about the changes that have taken place;
- lack of expectations regarding remuneration, reaction to events in accordance with the expectations of management;
- responding to information in accordance with the established habits;
- the level of uncertainty around the object [79].

A special case of functional fixation in financial markets is the inability of investors to change their decision-making process in response to changes in calculations that are based on actual data.

The phenomenon of functional fixation and its consequences has been extensively investigated by academics. Research has shown that investors are prone to functional fixation when comparing financial statements of companies that use different accounting standards. This situation is described in Mey's work (1932) [80].

Further development of the hypothesis of functional fixation was carried out in Hand (1990), who proposed and tested the extended hypothesis of functional fixation [81].

Probable solutions to overcome the functional fixation are continuous training, the use of an appropriate form of information presentation, the dissemination of financial information, using digital reporting technologies.

Consequently, the existence of functional fixation can lead to incorrect pricing in financial markets. Therefore, investors who understand the real situation in the company without affecting their functional fixation can get better results in the process of buying and selling financial assets than those that are under the influence of functional fixation. Functional fixation may also be one of the causes of various anomalies in financial markets, for example, over or under reactions.

Thus, we can conclude that the hypothesis of an efficient market was the dominant theory that explained the behavior of financial markets for many years. It influenced the development of the economic theory (for example, the modern portfolio theory), as well as the development of the financial markets themselves (for example, due to it, stock exchanges appeared and received further development). But the number of inconsistencies in the real situation and overly severe constraints put the theory in question and encouraged the development of alternative concepts, the most influential of which at present is behavioral finance.

2.2. Systematization of methods of neutralization of information asymmetry in financial markets

Classical economic theory attaches great importance to the business reputation of a person engaged in economic activity, putting a direct return on the profit from the transparency of market information. That is considered that people act accordingly to their interests without deception and without violating the terms of the contract because it can immediately become known to other players in the market. And this will

mean costs that will far outweigh the benefits of any deception, and most importantly, the loss of reputation. Thus, the existence of information asymmetry violates the balance of power, because opportunistic behavior is transformed from the theoretically possible to a real element of economic life.

Information asymmetry poses a real threat to the market mechanism, both at the level of relations between individual economic actors and at the level of individual markets and the economic system as a whole. By the nature and manifestations of the forms of the negative effects of the existence of information asymmetry, the market chooses an unfavorable selection (full or partial crowding out of "good" goods by "bad", as a result of information asymmetry in the market) and moral hazard (the risk is related to the unconsciousness of the parties of agreement).

Thus, based on the urgency of the problem of the existence of information asymmetry and its consequences, we consider that it is necessary to systematize the results of scientific research in the context of identifying approaches and methods for reducing and even overcoming this phenomenon. Implementing a transparent state policy that facilitates business, combating corruption and responsibility for violating or ineffective implementation of certain aspects of government policy will also contribute to reducing information asymmetry.

The importance of this task is confirmed by the presence of a large number of scientific works, offering a number of concepts and approaches to combating information asymmetry and manifestations of its effects.

Thus, according to J. Akerlof, there are only two ways of solving the problem of information asymmetry - a business guarantee and an appropriate reputation [82].

The theoretical basis of the methods of combating information asymmetry was the "theory of market signals" by M. Spence. According to this theory, in order to counter

adverse selection, sellers should provide additional information about the quality of their products (certificates of quality, qualifications, trademarks, warranties, trademarks, reputation of the company, diplomas of various competitions, recommendations, as well as payment of dividends as a measure of the company's well-being) [83]. This theory of signals was developed in the works of J. Stiglitz and M. Rothschild through the mechanism of "reverse market adaptation", which explains how insufficiently informed market participants receive information from more informed participants. The best example is the fact that an insurance company (that is, an insufficiently informed participant) should stimulate its customers (this is a well-informed participant) in order to "force" them to sell information about their insurance risk [82, 84].

According to S. Vickri, informational asymmetry can be reduced through so-called "Vickri auctions" (or "second-price auctions"), where the participants try not to win the price, but to find out the true value of the goods [82, 85].

The analysis of the works of other scholars-economists showed that, despite the variety of methods and tools used to reduce information asymmetry, the problem of overcoming its negative consequences stays relevant. In order to identify additional methods of combating informational asymmetry, an author's classification of methods of struggle was developed (Fig. 2.1), which contribute to reducing information asymmetry in the economy. The proposed list obviously does not claim to be final versatility but provides a general idea of the main opportunities that are available to the state, enterprises, and individuals.

As a consequence of the global financial crisis, there is a significant decrease in the level of public confidence in the banking system, which can largely be explained by the sharp increase in information asymmetry. One of the steps to restore

confidence in the domestic banking system has been signals from the state regarding its reliability.

Akerlof J. notes that in the developed countries, the information asymmetry is somewhat lower than in developing countries since in developed countries the state / public control over the quality of products is effectively established [87].

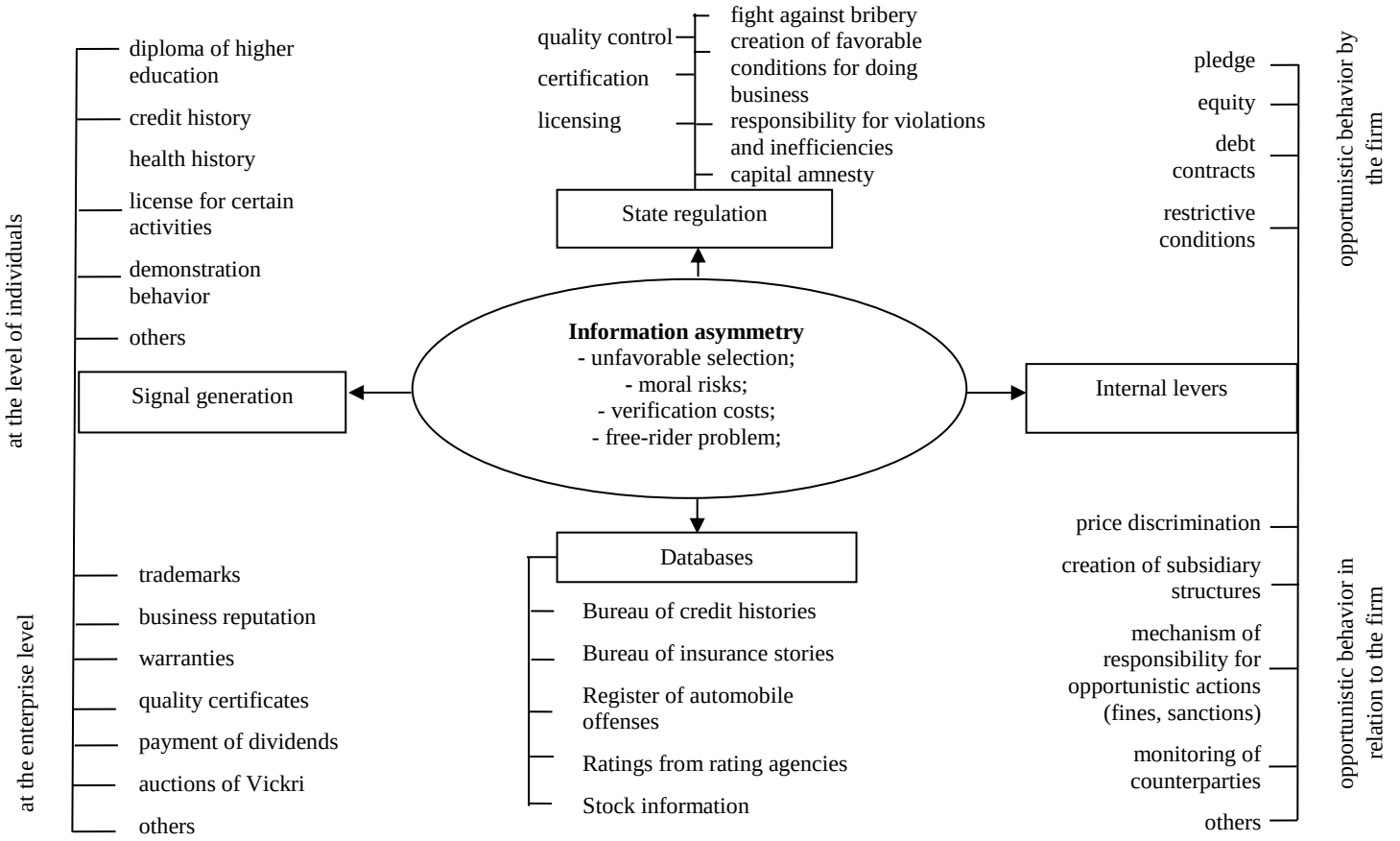

Figure 2.1 – Methods of combating information asymmetry [171]

Thus, holographic marks, which are an element of state regulation of information asymmetry, are difficult to counterfeit and their presence on the product indicates the conformity of internal content with the declared indicators. Other examples of state regulation of information asymmetry may be licensing and certification.

Diversification of prices for the same service for different consumers reduces the level of moral risks and counteracts unfavorable competitive selection [88].

At the level of "state-entities" in developing countries, a method is used to reduce information asymmetry through an amnesty of capital. This approach was proposed by E. Soto for countries such as Ukraine, where the shadow economy became a classical consequence of information asymmetry [89, 90]. At even higher-state levels there are elements that counteract the information asymmetry of the modern world financial system. These elements are rating agencies and, accordingly, their assessments that are carried out at the national level and the level of individual enterprises and determine the status of a certain economic entity as much as possible.

At the level of "management-shareholders," the protection of investors' interests can take place through monitoring (audit or verification of management activities) by shareholders of the firm's activities [91].

Also, on the background of the existence of some difficulties in applying traditional methods (verification costs, the problem of a free traveler, etc.), there are several alternative approaches to reducing information asymmetry. The most common is the use of mediators in different types of markets. Depending on their role, mediators can be classified into two groups: financial and economic mediators (which help to reduce the level of information asymmetry in the economy) and information mediators (their main activity is the professional provision of information and information services

to the market, which leads to a decrease in the level of information asymmetry). An example of the first group can be venture funds, the second – audit firms, rating agencies, financial analysts, consulting companies, etc. Some scholars additionally distinguish reputable mediators (for example, investment banks), which, in their reputation, guarantee the integrity and transparency of the transaction, thus reducing the level of information asymmetry for this transaction [92].

T. Veblen draws attention to the problem of decision-making by consumers when they are not able to fully analyze all possible proposed variants, which is a signal of information asymmetry. Therefore, it can be reduced by the so-called "sifting" method: a certain type of less informed parties is offered a set of alternatives that helps make a choice. However, at this moment there is a disclosure of private information on this side [93].

Thus, informational asymmetry, regardless of the nature of its manifestations, has a serious negative impact on the efficiency of the decision-makers adopted by the market participants, as well as on the functioning of individual markets and the economy as a whole, which greatly actualizes the need to seek methods and approaches to neutralize this impact.

2.3. The current trends in the neutralization of information asymmetry in the financial markets (on the example of the market of responsible investment)

Implementation of the concept of sustainable development at the global and national financial levels, enshrined in the United Nations Sustainable Development Goals by 2030, requires adequate financial support and plays an important role in enhancing the financial sector's stability and financial security. The mainstream in providing financial resources for the needs of sustainable development and other initiatives is

responsible investment, or investment based on ESG - criteria (environmental, social and governance) that relate to the areas of sustainable development.

According to the Global Sustainable Investment Alliance, over the past 2 years (2014 to 2016), the volume of operations in responsible investment markets is growing at a steady pace. Thus, the volume of responsible investment in the United States grew by 33.0 % and reached 8.7 trillion of USD, while in the EU, its growth rate amounted to 11.0 % and in absolute terms, this figure reached 12 billion of USD [94]. At the same time, the issue of ensuring transparency and negative selection of securities in responsible investment markets, especially in the context of the application of greenwashing, by companies trying to improve their reputation as followers of the concept of sustainable development, requires the study of tools to neutralize information asymmetry in these markets

Despite the growing dynamics of volumes of operations in the world's markets for responsible investment, the promotion of environmental (green) accounting and reporting and disclosure by companies by ESG - the criteria of reliability, transparency of their information provision becomes particularly acute for investors.

The theoretical basis for the study of information asymmetry in the economy was formed by K. Arrow [95], D. Akerlof [87], J. Stiglitz [96], and O. Williamson [97]. Among Ukrainian scientists, the problem of neutralization of information asymmetry in financial markets was highlighted by G. Kravchuk, V. Shevchuk, O. Plastun [98], V. Ogienko, and O. Lunjakov [53]. However, in the works of these scientists, information asymmetry in responsible investment markets has not received enough coverage.

Instead, some aspects of the functioning of responsible investment markets in the context of their information transparency were considered by foreign scholars such as

S.Vindolff (studying the problematic aspects of the formation of sustainable development ratings) [99], J. Chuyi et al. (research on the relationship between corporate social responsibility of companies and information asymmetry in the market) [100], B. Cheng et al. (researching the role of corporate social responsibility of the company in facilitating access to financial resources through minimization of information asymmetry) [101].

The purpose of the study is to analyze the current world-wide approaches to the neutralization of information asymmetry in transactions between participants in responsible investment markets in order to ensure their transparency.

Information asymmetry is a market situation where some economic agents have a large amount of information to make informed decisions than others. Among the main manifestations of information asymmetry, we can name the unfavorable selection in the market and the opportunistic behavior of managers as a partial case of the problem "principal-agent" [86].

Unfavorable selection as a manifestation of information asymmetry, which leads to the displacement of securities of the low quality of high-quality securities in the markets for responsible investment is realized in this way. An investor-oriented towards forming a portfolio of companies selected according to the ESG criteria will invest in revalued instruments and exclude underestimated, thereby sacrificing profitability in exchange for compliance with the principles of sustainable development. At the same time, other investors, investing in undervalued measures of sustainable development, the paper will receive higher returns. The dynamics of responsible investment indices in comparison with traditional financial indices illustrates this fact.

Another manifestation of information asymmetry in responsible investment markets is the opportunist behavior of

the company's executives who use the technology of greenwashing in order to increase the attractiveness of their reporting in the eyes of investors in view of the unfair use of practices and initiatives of sustainable development, manipulation of reporting with concealment of facts, which negatively affects the reputation of the company as a friend of environment and society. Artificial "decorating" of reporting on sustainable development and deliberate concealment of indicators that negatively characterize the company, increase the level of information asymmetry.

In theory and practice, the functioning of financial markets has resulted in a significant number of methods of neutralizing information asymmetry – rating, credit history, the holding of auctions, the provision of audit opinion, etc., the essence of which is to guarantee the transparency of certain information for the adoption of economic decisions by information mediators, which have a certain reputation [86].

Among the above methods, the rating itself occupies a prominent place not only in financial markets as an integral part of the world financial architecture (at the level of states, markets, individual financial intermediaries, market products), but also in the markets for responsible investment. The rating allows interested parties, primarily investors, to investigate the status of investment objects on the basis of a formalized system of criteria and is considered one of the most effective ways to reduce information asymmetry.

The Global Initiative for Sustainability Ratings, an international supranational organization that deals with aggregation and benchmarking in responsible investment markets and helps minimize information asymmetry on them. Its mission is to disseminate transparency and best practices in research, indexes, and ratings based on ESG-criteria to improve company performance, and investor decision-making [102].

Among the key instruments for combating information asymmetry, the data of which are summarized by the Global Sustainable Development Sustainability Index, indexes, rankings and ranking of sustainable development can be called. The common feature of these tools is the close link with the assessment of the degree of compliance by companies with ESG-criteria (one or all of them). The specifics of each instrument and their examples are given in Table 2.1.

Table 2.1. Key instruments for neutralizing information asymmetry in world-wide responsible investment markets [author's development]

Tool	Definition	Example
Rating	Assigning an alphanumeric "score" to companies based on their effectiveness according to a given systematic set of ESG-criteria	-oekom Carbon Risk Rating; -RepRisk Rating; -The Sustainability Yearbook; -Vigeo Eiris Sustainability Rating.
Ranking	Ordering a plurality of companies according to a certain set of ESG-criteria	-PROhumana Corporate Sustainability Ranking; -Vigeo Eiris Emerging 70 Ranking; -Channel NewsAsia Sustainability Ranking; -Corporate Human Rights Benchmark; -CR's 100 Best Corporate Citizens.
Index	A consolidated group of securities parameters of certain companies that meet ESG-criteria on specific markets or within certain sectors	-Bloomberg ESG Disclosure Scores; -DJSI Emerging Markets and other indexes of DJSI group; -Ethibel Sustainability Index (ESI) Excellence Global; -Euronext Vigeo Euro 120; -Global Compact 100 Index (GC 100); -MSCI Global Environment Index; -S&P 500 ESG Index.

In our opinion, considering the peculiarities of using these instruments of neutralizing information asymmetry between investors and companies in the markets for responsible investment should be conducted in the following areas:

– according to the structure of issuers of responsible investment ratings;

– for the target audience – the stakeholders;

– in terms of ranking – the key criteria.

Among the 651 tools of rating companies taking into consideration their progress towards sustainable development, that available on the market of responsible investing, the largest shares are held by indices of responsible investment (Fig. 2.2).

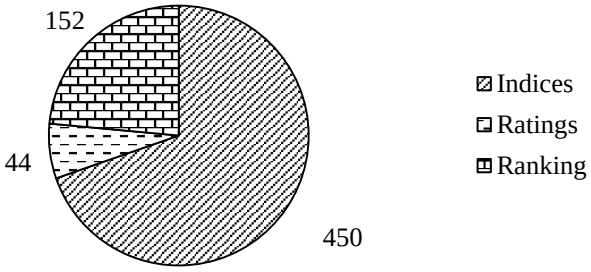

Figure 2.2. Rating products in the sphere of Sustainable Development in 2017, compiled by the authors according to GISR [94]

Usually, they are represented in each of the most well-known groups of information and analytical companies, along with traditional financial indices. Analyzing the structure of issuers of rating instruments in the markets for responsible investment, it should be noted that the data providers -

information and analytical companies and researchers constitute the most numerous group (94 organizations) among other information intermediaries (Fig. 2.3).

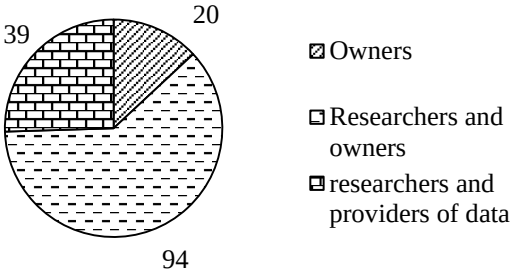

Figure 2.3. Structure of issuers of sustainable development ratings in 2017, compiled by the authors according to GISR [94]

The target audience for the publication and using of rating tools in the responsible investment markets also has a prevailing segment – 75.1% of all users of ratings, rankings and indices are occupied by investors (Fig. 2.4).

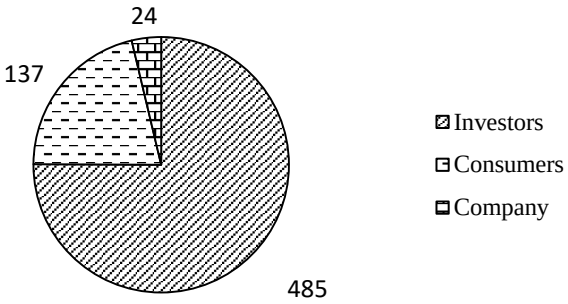

Figure 2.4. The target audience of sustainable development ratings in 2017, compiled by the authors according to GISR [94]

This share of the audience, which belongs to investors, is conditioned by the importance of these information products in the processes of adoption and justification of their information solutions, screening of companies, and the formation of investment portfolios and implementation of investment strategies.

The last direction of the analysis of rating tools in the world markets for responsible investment is the ranking of the rating criteria – key criteria for the rating (Fig. 2.5).

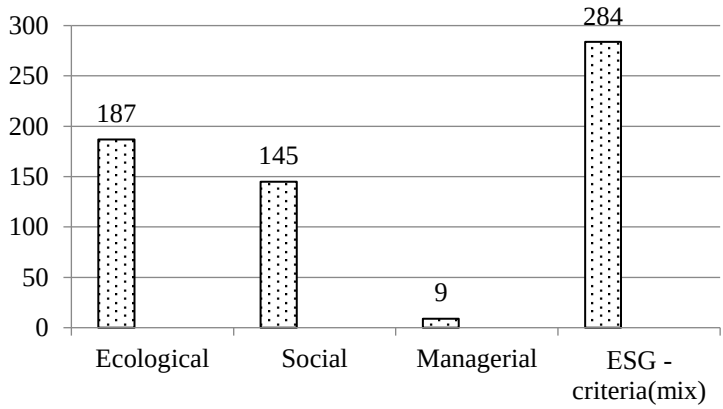

Figure 2.5. Criteria for the compilation of sustainable development ratings in 2017, compiled by the authors according to GISR [94]

As can be seen from Fig. 2.5, the critical mass of indices, ratings and rankings is based on a set of ESG-criteria, rather than on single criteria, which confirms the integral accounting of all dimensions of sustainable development in the course of investment processes and the need to take into consideration a wide range of environmental, social and economic (managerial) indicators, published in the reporting companies.

Among the aforementioned methods of neutralizing of information asymmetry in the markets for responsible investment, the index products of the largest information and analytical groups of the world occupy the large share among the ratings (450 products). The above stipulates the need for their detailed consideration.

The defining feature of the indices of responsible investment, which are benchmarks for investors' decision-making in the segment of sustainable investments, is the ability to reduce moral hazard and unfavorable selection as

manifestations of information asymmetry among financial market participants.

Unlike traditional indexes, responsible investment indices as tools for minimizing information asymmetries are oriented towards compliance by companies that constitute the goals of sustainable development that transform into criteria that are revealed in their corporate reporting.

These criteria for screening and the formation of responsible investment portfolios or the inclusion of companies in the sustainable development indices help to reduce gaps in reliable information and information asymmetry between investors and companies. In this case, usually, is included the best companies according to the best-in-class approach, which is a basket of traditional financial indices showing financial performance, but given the disclosure by such companies of compliance with these criteria and corporate social responsibility for the exclusion of trade in weapons, alcohol, tobacco and other negative business activities (so-called "death dealers").

For example, one of the Dow Jones Sustainability World Index (DJSI World) indexes represents the financial efficiency of 10 % of companies with the best corporate social responsibility achievements from the 2,500 largest S&P Global Broad Market Index companies and represents 60 industries classified by RobecoSAM in 47 countries of the world.

It is worth mentioning that the widely used term ESG - criteria (environmental, social, governance) is first used in the Principles of Responsible Investment, in particular, the first principle refers to the inclusion of ESG criteria in the process of analysis, investment and decision-making. A brief description of the criteria to be implemented in specific reporting indicators of constituents of indices of DJSI World Index relates primarily to each dimension of sustainable development (environmental, social, managerial (economic) (Tab. 2.2).

Table 2.2. ESG company criteria for inclusion in DJSI World

Criteria	Specifics
Economic criteria	Presence of a Code of Conduct / Compliance with Legislative Requirements / Countering Corruption / Corporate Governance / Risk Management / Economic Criteria Depending on the Sector.
Ecological criteria	Environmental reporting / Environmental criteria depending on the sector.
Social criteria	Charity / Practice of labor relations / Development of human potential / Social reporting / Attracting and retaining skilled personnel / Social criteria depending on the sector.

Based on the named ESG-criteria for each company, a final score is calculated that reflects the level of its corporate social responsibility, which in turn determines the company's weight in the DJSI World index.

Thus, responsible investment indices today are an important tool for minimizing information asymmetry between companies and investors amongst other sustainable development ratings. Their key feature is the neutralization of adverse selection and moral hazard between using ESG-criteria.

The next important method of neutralizing information asymmetry in responsible investment markets is the ratings (152 products) and ranking (44 products) of sustainable development.

The rating method has well established itself in the financial markets at different levels of their financial architecture and in relation to their different participants. The main advantage of ratings and rankings in responsible investment markets is to provide investors with a formalized system of criteria for an objective picture not only of financial standing but also of corporate social responsibility of investment objects (based on

the implementation of values, dimensions, and criteria of sustainable development in the strategy its activities). Among the examples of the most well-known sustainable development ratings in responsible investment markets are Oekom Carbon Risk Rating, RepRisk Rating, The Sustainability Yearbook, Vigeo Eiris Sustainability Rating, etc.

At the same time, the ratings of sustainable development in responsible investment markets have a less long history and less extensive methodological base than traditional financial ratings. Hence there is the necessity to develop clear principles for their design and application.

Among the basic principles developed so far, with the aim of establishing benchmarks in responsible investment markets, the Global Initiative for Sustainability Ratings (Global Initiative for Sustainability Ratings) principles can be called. Its mission is to promote transparency and best practices in research, indexes, and ratings based on ESG-criteria to improve companies' operations and investor decision-making [102].

The organization has developed 10 principles for making ratings on sustainable development in responsible investment markets, namely:

– transparency, inclusiveness, confirmation, and impartiality – as principles defining the main parameters of the process of assigning ratings;

– comparability, balance, value chain, long-term horizons, the context of sustainable development, comprehensiveness and significance – as principles defining the substantive aspects of rating [103].

It is worth noting that these principles are in line with the world-wide benchmarks in the formulation of companies that invest in the principles of reporting on the sustainable development of the Global Reporting Initiative (Global Reporting Initiative). Their list includes the following principles: involvement of stakeholders, the context of

sustainable development, materiality, completeness, balance, accuracy, comparability, timeliness, clarity, reliability.

Comparison of these principles allows us to conclude that the work of international organizations in the field of neutralization of information asymmetry by rating means, as well as the necessity to harmonize their efforts to create a unified methodological basis for providing ratings for sustainable development.

Thus, information asymmetry in the context of the unfavorable selection and opportunistic behavior of managers takes place in the markets for responsible investment, regardless of the peculiarities of disclosure and the processes of making investment decisions on them. Based on the generalization of existing methods of neutralizing information asymmetry, it has been proved that rating is one of the most important methods among others based on world experience. It is established that the key rating tools published by the Global Sustainability Ratings Initiative are indexes, the ranking of companies based on ESG criteria. The analysis of the application of rating tools in the world experience has shown that the largest group of rating products used by participants in responsible investment markets to minimize information asymmetry is the indices of sustainable development, based on a set of ESG criteria. For the most part, their issuers are researchers and market information providers, and the target audience is investors.

The urgent issues of forming the basis for a rating in the markets for responsible investment lies in the area of further improvement of the system of principles for the creation and assignment of sustainable development ratings as an important stage in developing a competitive and transparent market environment.

Despite the importance of sustainable development ratings for the efficient and transparent functioning of responsible

investment markets, such services are not yet demanded in Ukraine due to the underdeveloped market and the initial stage in implementing the ideology of sustainable development in the economic system. This requires the development of methodological and scientific-practical recommendations in this direction that would allow forming the basis for the development and transparency of the responsible investment market in Ukraine.

3. MODERN DETERMINANTS OF THE FINANCIAL SECTOR STABILITY AND THE ROLE OF THE STATE IN THE PROCESS OF ITS ASSURANCE

3.1. Generalization of the theoretical and methodological basis of research and normalization of financial sector stability

Economic growth and development, as well as social well-being, are one of the most important strategic goals of the state. It could be achieved due to the functioning of the financial sector that is sustainable to external and internal shocks.

According to the Comprehensive Program of Ukrainian Financial Sector Development Until 2020: "the financial sector is one of the most important sectors of the national economy, where the formation and distribution of financial resources and services related to the activities of financial institutions take place" [53].

According to the Compilation Guide of International Monetary Fund on Financial Soundness Indicators, the financial sector (sector of financial corporations) – it is all resident corporations, as well as quasi-corporations, whose main function is to provide financial services, including insurance and pensions, to other institutional units [8].

The financial sector includes deposit-taking corporations; central bank; other deposit-taking corporations (banks); money market funds; other financial corporations; investment funds (except for money market funds); other financial intermediaries (except insurers and pension funds); financial auxiliary institutions; captive financial institutions and money lenders; insurance companies; pension funds [14].

The financial sector is a set of organizations that provide financial intermediation and mediate the functioning of the real sector and capital sector. The effective activity of the financial

sector is the basis for sustainable economic growth since this particular segment of the economy serves as a 'bridge' between the financial market and the real sector of the economy for financial security. The structure of the financial sector of Ukraine is shown in Figure 3.1.

As you can see from Figure 3.1, the financial sector includes banks and non-bank financial institutions. Banking institutions include specialized and universal banks. Non-bank financial institutions include insurance companies, non-state pension funds, credit unions, pawnshops, leasing companies, and joint investment institutions. The financial sector provides the needs of the institutional sectors of the economy in the formation of finance through interacting with the real sector entities.

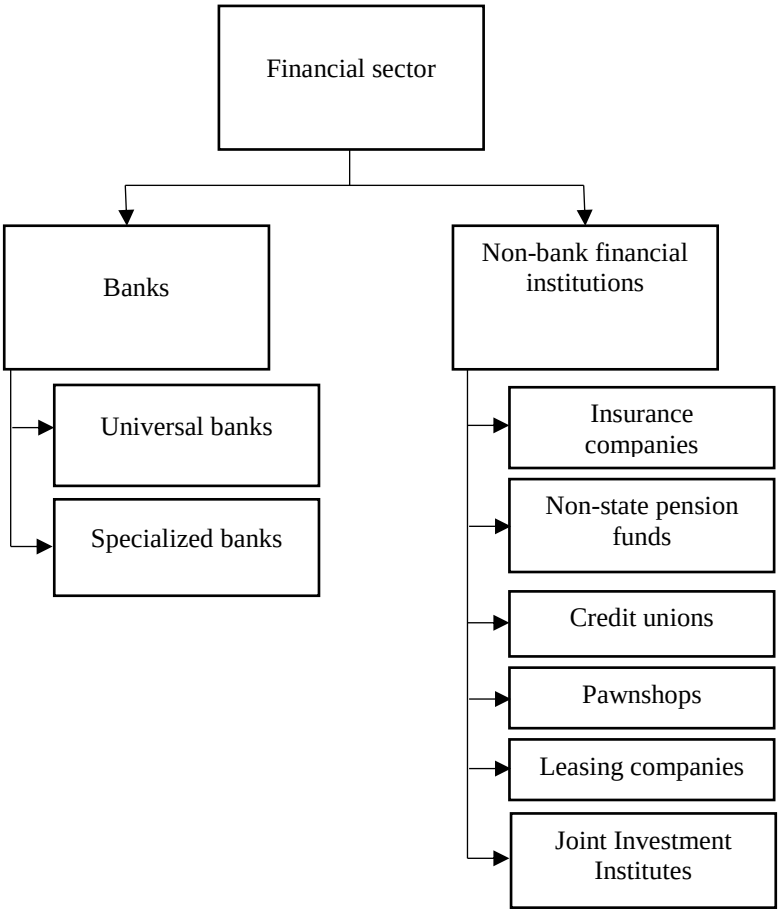

Figure 3.1. The Ukraine financial sector structure, compiled by authors

The functioning of the financial sector depends on the state's activities because the specified sector of the economy is an important instrument for implementing the state policy aimed at increasing financial stability and economic growth. These strategic goals can be achieved by efficient allocation and

redistribution of gross domestic product among the population, economic entities, regions, as well as by stimulating the development of small and medium-sized businesses, improving the investment climate and stabilizing the overall economic situation of the country.

The assurance of Ukraine financial sector stability is the main direction of the state's financial policy to achieve the above-mentioned goals. Table 3.1 reflects the theoretical approaches of foreign and domestic scientists to the definition of "financial stability".

Table 3.1. Theoretical approaches to the definition of "financial stability", compiled by authors

Author	The essence of the "financial stability" concept
Garry J. Schinasi [15]	Effective allocation of economic resources, financial risks, their assessment, and management.
Andrew Crockett [1]	Lack of volatility, in which economic activity is under the influence of fluctuations in prices of financial assets or the inability of financial institutions to fulfill their obligations.
Willem Frederik "Wim" Duisenberg [4]	The adjusted functioning of key elements, which make up the financial system.
U. Das, M. Quintyn, K. Chenard [2]	The main component of financial system soundness.
Michael Foot [12]	Monetary (price) stability; approximation of the level of employment in the economy to the natural level; confidence in the economic operations of key financial institutions and markets; the absence of a negative impact of the movement of prices on real and financial assets in the economy.

continued table 3.1

National Bank of Ukraine [61]	The state of a dynamic financial system, in which the impact of any shocks on the financial system does not prevent it from ensuring effective redistribution of financial resources in the economy, the functioning of the payment system, as well as shock absorption.
Central Bank of the Republic of South Africa [10]	The absence of macroeconomic losses from the shocks that affect the system of financial exchange, between households, corporations and financial institutions.
The Deutsche Bundesbank [1]	A stable state in which the financial system effectively performs its key functions, such as resource allocation and risk reduction, as well as making payments.
The central bank of Norway [9]	The absence of crises in the financial system, that means, the financial sector is sustainable to shocks of financial institutions or financial markets.
Central Bank of the Netherlands [16]	The ability of the financial system to effectively allocate resources and absorb shocks, avoiding devastating effects on the real economy or on other financial systems.
Green book (Consultations on improving the efficiency of regulation and supervision of the financial sector in Ukraine) [39]	The state of the financial system development, in which the impact of any action on the financial system does not significantly affect the ability of the financial system to perform its own functions (creating conditions for the sustainable development of the Ukrainian economy).

We can make the following conclusions based on an analysis of definitions given in Table 3.1. Garry J. Schinasi defines the essence of "financial stability" from the position of the process that means the direct distribution of economic resources and financial risks. In our opinion, this approach does not reflect the integral nature of this concept. Andrew

Crockett in his definition of the essence of "financial stability" refers to the antagonistic concept of "financial instability," that expresses the essence of the first through of the lack of demonstration of the second. In our opinion, such approach may take place, but we believe that, in the absence of financial instability, it is impossible to identify the ability of the financial system to sustainable opposition to negative economic trends. Similar approaches to the definition of this concept are used by the Central Bank of the South African Republic and the Central bank of Norway, which will define "financial stability" due to the absence of crises and shocks.

In the definition of Wim Duisenberg, there is a focus on the elements of the financial system and the importance of their integral functioning. A comprehensive approach to determining the essence of this concept is used by Michael Foot, which reflects it through a list of factors such as monetary stability, approximation of the level of employment to the natural level; confidence in the economic operations of key financial institutions and markets; the absence of a negative impact of the movement of prices on real and financial assets.

According to the National Bank of Ukraine, the Deutsche Bundesbank and the authors of the Green Paper, "financial stability" is reflected through the concept of "financial condition", in which the effective functioning of the financial system is possible. From the standpoint of the financial system ability to function effectively and counteract a shock, this concept is considered by the Central Bank of the Netherlands.

We consider it is necessary to investigate the difference between the concept of "financial stability" and "financial stability" for better disclosure of the essence of the latter. Financial stability is a stable state of the country financial system, which ensures smooth implementation of the calculations in the economy, a high level of trust in financial institutions, the absence of excessive volatility of financial

markets, the efficient allocation of financial resources and the ability to manage financial risks, and a safety margin in financial system, which allows to counteract negative economic shocks in the future and prevent their negative impact on the economy [21]. That is, the concept of financial stability is broad and covers monetary stability, employment, and trust in financial institutions. In turn, the concept of 'financial stability' is considered in the economic literature as a component of financial stability, for example, according to U. Das, M. Quintyn, K. Chenard, financial stability is a major component of financial stability (Tab. 3.1).

The National Bank of Ukraine defines this concept as the state of a dynamic financial system in which the impact of any shocks on the financial system does not prevent it from ensuring effective redistribution of financial resources in the economy, the functioning of the payment system, as well as shock absorption (Tab.3.1). Based on analysis of the above interpretations of the concept, we can conclude that both categories - 'financial stability' and 'financial sustainability" - in these cases are considered from the standpoint of the state, but financial stability covers directly the functions of the financial system and it is a narrower concept than the concept of 'financial stability'. It is also worth noting that financial stability is possible due to the dynamism of the system, while financial stability is directly a stable state.

In accordance with the traditional definition of the concept of "financial stability", its main criteria are [8]:

– the availability of efficient financial markets and financial institutions;
– the stability of key financial assets and markets;
– the existence of an effective regulatory infrastructure;
– the stable functioning of the monetary system;
– the natural level of employment;

– the absence of relative fluctuations in real estate and financial resources;

– the ability of financial institutions to comply with contractual obligations;

– the sustainable price level, or lack of inflation/deflation;

– the absence of macroeconomic losses from the shocks that affect the financial exchange system.

Consequently, summarizing the analysis of the theoretical essence of the concept of "financial stability", we define that it is the ability of the financial system in the conditions of economic imbalance effectively perform the main functions, such as effective allocation and redistribution of gross domestic product among population, territories and economic entities, risk alignment, and shock absorption, as well as ensuring the functioning of the payment system.

We believe that it is necessary to regularly assess the level of financial stability in order to enable the state to timely respond to the negative changes in the financial system. In order to assess the state of the financial system from the standpoint of stability, it is necessary to take into account the features of financial stability. There are the following features:

– the ability of the financial system to counteract economic shocks and minimize risks in the short and long term periods;

– the availability of influential financial instruments of state regulation;

– the availability of a well-functioning interaction of the financial system elements;

– the existence of an effective communication mechanism between individual elements of the financial system;

– the availability of high-quality legal and informational support.

An analytical approach to assessing the level of financial stability involves the calculation of relevant indicators – Financial Soundness Indicators. Financial Soundness Indicators

are statistical indicators, which are used to monitor the financial state and stability of the financial sector of the country, as well as to support macro-prudential analysis.

Financial Soundness Indicators are indicators of the current financial status and stability of financial institutions of the country and their counterparties from the sector of non-financial corporations and the household sector. The data includes information on the main Financial Soundness Indicators of deposit-taking corporations (banks) regarding capital adequacy, asset quality, profit and profitability, liquidity, market risk sensitivity and recommended Financial Soundness Indicators, as well as background data for their compilation. Financial Soundness Indicators give an idea of the markets in which financial institutions operate [23].

The International Monetary Fund envisages the compilation and dissemination of 40 financial soundness indicators by countries: 25 indicators for deposit-taking corporations (incl.12 core indicators) and 15 indicators for the customers of deposit takers [9]. These indicators are given in Tables 3.2 and 3.3.

Table 3.2. Financial Soundness Indicators for deposit takers

No.	Core Set	No.	Encouraged Set
1	Regulatory capital to risk-weighted assets	1	Capital to assets
2	Regulatory tier I capital to risk-weighted assets	2	Large exposures to capital
3	Nonperforming loans net of provisions to capital	3	Geographical distribution of loans to total loans
4	Return on equity	4	Gross asset position in financial derivatives to capital
5	Net open position in foreign exchange to capital	5	Gross liability position in financial derivatives to capital
6	Liquid assets to total assets (liquid asset ratio)	6	Trading income to total income

continued table 3.2

7	Liquid assets to short-term liabilities	7	Personnel expenses to noninterest expenses
8	Return on assets	8	Spread between reference lending and deposit rates (basis points)
9	Nonperforming loans net of provisions to capital	9	Spread between highest and lowest interbank rates (basis points)
10	Sectoral distribution of loans to total loans	10	Customer deposits to total (noninterbank) loans
11	Interest margin to gross income	11	Foreign-currency-denominated loans to total loans
12	Noninterest expenses to gross income	12	Spread between the highest and lowest interbank rate
-	-	13	Net open position in equities to capital

Table 3.3. Financial Soundness Indicators for other sectors, compiled by authors

No.	Sector and Financial Soundness Indicators
	Other Financial Corporations
1	Assets to total financial system assets
2	Assets to gross domestic product
	Nonfinancial Corporations Sector
3	Total debt to equity
4	Return on equity
5	Earnings to interest and principal expenses
6	Net foreign exchange exposure to equity
7	Number of applications for protection from creditors
	Households
8	Household debt to gross domestic product
9	Household debt service and principal payments to income
	Market Liquidity
10	The average bid-ask spread in the securities market

continued table 3.3

11	The average daily turnover ratio in the securities market
Real estate markets	
12	Residential real estate prices
13	Commercial real estate prices
14	Residential real estate loans to total loans
15	Commercial real estate loans to total loans

The National Bank of Ukraine uses the following key Financial Soundness Indicators for deposit-taking corporations [78]:

I1 Regulatory capital to risk-weighted assets;

I2 Regulatory Tier 1 capital to risk-weighted assets;

I3 Nonperforming loans net of provisions to capital;

I4 Nonperforming loans to total gross loans;

I5 Sectoral distribution of loans to total loans;

I6 Return on assets;

I7 Return on equity;

I8 Interest margin to gross income;

I9 Noninterest expenses to gross income;

I10 Liquid assets to total assets;

I11 Liquid assets to short-term liabilities;

I12 Net open position in foreign exchange to capital.

In addition, the National Bank of Ukraine uses such encouraged Financial Soundness Indicators for deposit-taking corporations [78]:

I13 Capital to assets;

I14 Large exposures to capital;

I15 Geographical distribution of loans to total loans;

I16 Gross asset position in financial derivatives to capital;

I17 Gross liability position in financial derivatives to capital;

I18 Trading income to total income;

I19 Personnel expenses to noninterest expenses;

I20 Spread between reference lending and deposit rates (basis points);

I21 Spread between highest and lowest interbank rates (basis points);

I22 Customer deposits to total (noninterbank) loans;

I23 Foreign-currency-denominated loans to total loans;

I24 Foreign-currency-denominated liabilities to total liabilities;

I25 Net open position in equities to capital.

For the nonbanking sector, following Financial Soundness Indicators are used [21]:

– Assets to total financial system assets;
– Assets to gross domestic product;
– Total debt to equity;
– Return on equity;
– Earnings to interest and principal expenses;
– Net foreign exchange exposure to equity;
– Number of applications for protection from creditors;
– Household debt to gross domestic product;
– Household debt service and principal payments to income;
– Average bid-ask spread in the securities market;
– Average daily turnover ratio in the securities market;
– Residential real estate prices;
– Commercial real estate prices;
– Residential real estate loans to total loans;
– Commercial real estate loans to total loans.

The information provision for evaluating financial stability is presented by the following normative and legislative documents:

– Compilation Guide of International Monetary Fund on Financial Soundness Indicators;

– The Financial Sector Assessment Program of the International Monetary Fund and the World Bank;

– Comprehensive Program of Ukrainian Financial Sector Development Until 2020;

– Law of Ukraine "On the National Bank of Ukraine";

– Order of the Ministry of Economic Development and Trade of Ukraine "On Approval of Methodological Recommendations for Calculation of the Level of Economic Security of Ukraine" 10. 29, 2013, No. 12777;

– Green book (Consultations on improving the efficiency of regulation and supervision of the financial sector in Ukraine);

– Monetary and Financial Statistics Manual and Compilation Guide (IMF).

The International Monetary Fund's Guide on Financial Soundness Indicators proposes tools for assessing the strengths and weaknesses of the financial system, as well as clarifications about Financial Soundness Indicators compilation for countries [8]. The Financial Sector Assessment Program of the International Monetary Fund and the World Bank helps to inform domestic politicians of the need for consistent action in areas, which required attention and offers countries the complex framework for reform in the financial sector [6]. The considerable attention of this Program is paid to the issue of financial stability.

The main aim of Comprehensive Program of Ukrainian Financial Sector Development Until 2020 is the creation of the financial system, which is capable of ensuring sustainable economic development due to efficient redistribution of financial resources in the economy based on the development of a full market competitive environment in accordance with the EU standards. It also highlights the current state and problems of the financial sector and includes the following objectives: financial stability and sustainable development,

financial sector infrastructure, protection of consumers and creditors, the institutional capacity of regulators [53].

The Law of Ukraine "On the National Bank of Ukraine' defines a list of functions of the National Bank, including the financial system's analysis in terms of financial stability. Article 7 also defines the features of ensuring the stability of the banking system. Article 55 defines the main objective of banking regulation and supervision - security and financial stability of the banking system, protection of the interests of depositors and creditors [33].

The Order of the Ministry of Economic Development and Trade of Ukraine "On Approval of Methodological Recommendations for Calculation of the Level of Economic Security of Ukraine" 10. 29, 2013, No. 12777 contains the specified components of economic security, which have a direct relation to financial stability, in particular financial security, banking security , budget security, and calculation indicators of their level [58].

The Green book (Consultations on improving the efficiency of regulation and supervision of the financial sector in Ukraine) determines the aim of policy as increasing of regulation and supervision effectiveness in the Ukraine financial sector, which will enhance the competitiveness of financial institutions and ensure the stability of the financial sector. There is also given the definition of "financial sector stability" [39].

Monetary and Financial Statistics Manual and Compilation Guide establish the basic concept for the analytical presentation of monetary statistics, which is important for the formation and control of monetary policy. In addition, the statistics provided in the Guide can be used to assess the financial system stability [14].

3.2. The role of macroprudential analysis tools in ensuring financial stability

In order to ensure financial stability and financial stability, it is necessary to develop and implement an effective macroprudential policy, apart from its evaluation. Macroprudential policy is a set of preventive measures that aimed at identifying and assessing systemic risks for financial stability and taking measures to minimize these risks [81]. The main components of the macroprudential policy are macro-prudential supervision, analysis, and regulation.

Macroprudential supervision is the supervision of the stability of the financial sector as a whole. It includes the analysis of risks, that arising from collective actions of financial institutions, the tendency of the financial system to potential shocks and the analysis of macroeconomic consequences in the case of problems in the financial sector.

The macroprudential analysis is a method of continuous monitoring, a comprehensive analysis of the financial system state, its internal relations, interaction with the real sector, the budget sphere, as well as with the tendencies of world financial and commodity markets development in order to ensure the stable functioning [24].

Macroprudential regulation is the measures to reduce the systemic risk of the financial sector and the risk of a financial crisis. Macroprudential regulation is also aimed at early detection of imbalances accumulated in the economy, the emergence of deficiencies in the markets of various assets and minimization of systemic risks [20].

The main instruments of macroprudential regulation are [57]:

- Financial Soundness Indicators;
- Capital adequacy;
- Countercyclical capital buffer (from 0% to 2.5%);

– Capital buffer for systemically important banks (from 1% to 2 %);
– Leverage ratio (ratio of tier I capital to all assets);
– Limits on maturity mismatch and reserve requirements;
– Reserve requirements;
– Loan-to-income ratio, LTI;
– Loan-to-value ratio, LTV;
– Debt-to-income ratio, DTI;
– Caps on foreign currency lending;
– Ceilings on credit or credit growth;
– Capital requirements based on stress tests;
– Restrictions on profit distribution;
– Higher disclosure requirements;
– Licensing and corporate governance standards.

There are the following bodies, which provide macroprudential regulation:

– Ministry of Finance of Ukraine (is responsible for creating the conditions for stable economic development, and also conducts, together with other executive authorities, an analysis of the financial and economic state of the state and prospects of its further development) [65];

– The National Securities and Stock Market Commission of Ukraine (its purpose is to create conditions for the proper and efficient functioning of the securities market, provide cash capital to the needs of the country's economy, create conditions for the formation of powerful domestic investors and ensure the protection of investors' rights) [60];

– The National Commission for State Regulation of Financial Services Markets (is responsible for creating conditions for the effective functioning of the non-bank financial services markets, strengthening of systemic stability in these markets, integration into the world financial space without threats to national interests and economic security of Ukraine) [29];

– The National Bank of Ukraine (its mission is to ensure price and financial stability in order to promote Ukraine's sustainable economic development) [30];

– Deposit Guarantee Fund (cooperates with the National Bank of Ukraine in order to ensure the stability of the banking system of Ukraine and protect the interests of depositors and other bank lenders) [34];

– Financial Stability Council of NBU and Financial Stability Department of NBU (its purpose is to ensure the timely detection and minimization of risks that threaten the stability of the banking and financial system of the state) [31].

Today, in conditions of constant change, there is a need for a timely and objective assessment of the strengths and weaknesses of the financial system. The aim of Financial Soundness Indicators analysis is to ensure this need. The Financial Soundness Indicators reflect the current financial state and stability of the whole financial institution sector in Ukraine, as well as the corporate and household sectors. In table 3.4 presented the values of core and encouraged Financial Soundness Indicators for Ukrainian deposit-taking institutions, compiled by the author based on the National Bank of Ukraine open data.

Table 3.4. Values of core Financial Soundness Indicators for Ukrainian deposit takers till 2013 to 2017

No.	Core Financial Soundness Indicators	Year				
		2013	2014	2015	2016	2017
1	Regulatory capital to risk-weighted assets	18.26	15.60	12.31	12.69	16.10
2	Regulatory Tier 1 capital to risk-weighted assets	13.89	11.21	8.30	8.96	12.12

continued table 3.4

3	Nonperforming loans net of provisions to capital	30.65	61.07	129.02	89.37	70.18
4	Nonperforming loans to total gross loans	12.89	18.98	28.03	30.47	54.54
5 5.1	Sectoral distribution of loans to total loans: Residents (Percent)	98.72	96.05	94.54	95.92	94.21
5.2	Sectoral distribution of total loans: Deposit-takers (Percent)	1.99	1.14	0.72	0.49	0.54
5.3	Sectoral distribution of total loans: Central bank (Percent)	0.00	0.00	0.00	0.00	0.00
5.4	Sectoral distribution of total loans: Other financial corporations (Percent)	2.05	2.38	1.49	1.11	1.01
5.5	Sectoral distribution of total loans: General government (Percent)	0.63	0.46	0.32	0.14	0.14
5.6	Sectoral distribution of total loans: Nonfinancial corporations (Percent)	73.48	72.42	75.29	78.55	76.47
5.7	Sectoral distribution of total loans: Other domestic sectors (Percent)	20.57	19.65	16.72	15.63	16.06
5.8	Nonresidents (Percent)	1.28	3.95	5.46	4.08	5.79
6	Return on assets	0.26	-4.24	-5.54	-12.47	-1.76

continued table 3.4

7	Return on equity	1.72	-31.95	-65.51	-122.17	-15.34
8	Interest margin to gross income	58.56	48.46	39.00	45.94	50.20
9	Noninterest expenses to gross income	65.95	59.85	54.40	60.91	76.14
10	Liquid assets to total assets	20.63	26.4	33	48.53	53.94
11	Liquid assets to short-term liabilities	89.11	86.14	92.87	92.09	98.37
12	Net open position in foreign exchange to capital	6.94	31.69	136.03	118.88	89.61

* Compiled by Author based on NBU data [78]

Based on the analysis of data from Table 3.3, it can be concluded that the first core Financial Soundness Indicators for Ukrainian Deposit takers is within the normal range during the investigated period, because the NBU determined that the ratio of Regulatory capital to risk-weighted assets for operating banks should be at least 10 % [25]. Therefore, we can conclude that, in general, Ukrainian deposit takers are able to pay in time and totally cover their obligations arising from trade, credit or other monetary operations. The last three years there is a positive trend towards an increase of the indicator.

Since the regulatory capital of the bank consists of the main (Tier 1) capital and additional (Tier 2) capital, the ratio of the Regulatory Tier 1 capital to risk-weighted assets determines the level of risk assumed by the owners of the bank. This indicator is at a high level, and over the last three years, there is a tendency to increase its value. That is, in general, the share of risk borne by lenders and depositors of banks decreases.

The highest value of the Nonperforming loans net of provisions to capital indicator was 129.02 in 2015. It means the excess of nonperforming loans amounts over the amount of capital. In the last three years, this value has been decreased

and was 70.18 % in 2017. As we can see, the amount of the nonperforming loans is significant relative to the amount of capital, that is, there may be doubts about the ability of banks to cover losses associated with inactive loans at the expense of capital.

More than half of total gross loans in the portfolio of Ukrainian deposit takers are nonperforming. It means that it has low quality. In general, the 54.54 % of loans in total gross loans amount was nonperforming in 2017. The increasing of the ratio of Nonperforming loans to total gross loans over the last five years is 41.65 pp. that is a negative trend.

Based on Sectoral distribution of loans to total loans analysis we can notice, that the prevailing share in total loans belongs to residents loans. This indicator is fluctuating from 94.21 % in 2017 to 98.72 % in 2013. Among residents, the main share in total loans has nonfinancial corporations – 76.47 % in 2017. On the second place in the sectoral distribution of total loans are the loans of other domestic sectors – 16.06 % in 2017. In 2017 loans of Nonresidents had only 5.79 % share in total loans. Other financial corporations loans – 1.01 % and other sectors – less than 1 %.

The efficiency of the assets used by Ukrainian deposit takers is low because the value of the Return on assets indicator over the past four years is negative. In 2017 the value of indicator was – 1.76 %. In general, there is a tendency of indicators decreasing, as in the period from 2013 to 2017 the value has decreased by 2.02 pp.

Taking into account the value of the Return on equity indicator, we can conclude, that Ukrainian banks use the capital ineffective. Only in 2013, there is a positive value of this indicator, in the next four years – the value is negative. In 2017, the indicator was 15.34 % that means a loss-making activity of Ukrainian Deposit takers.

Interest margin to gross income indicator was 50.20 % in 2017. It means that slightly more than half of the gross income of Ukrainian deposit takers was formed at the expense of the interest margin. Throughout the investigated period, the value of the Interest margin to gross income indicator has been fluctuating. For example, from 2013-2015 its value decreased from 58.56 % to 39.00 %. In general, it was by 19.56 pp. In the period from 2015 to 2017, the value of the indicator increased from 39.00 % to 50.20 %, in general by 11.2 pp.

Administrative expenses of Ukrainian deposit takers were 76.14 % of gross income in 2017, as evidenced by the value of the indicator of the ratio of noninterest expenses to gross income. Over the past five years, the indicator has been at a high level, at least 54.40 % in 2015. It means that Ukrainian deposit takers were 54.4 kopecks noninterest expenses, and in 2017, it was 76.14 kopecks.

Based on Table 3.3, we can conclude that liquid assets indicator has a high level. In 2017 Liquid assets to total assets value was 53.94 %. It means that more than half of the total assets of Ukrainian deposit takers are liquid. In the dynamics, the value of the indicator increases. In general, over the last five years, the increase was 33.31 pp.

The value of the Liquid assets to short-term liabilities indicator is at a rather high level. In 2017 it was 98.37 %. The lowest value of this indicator was 86.14% in 2014. It means that over the past five years, Ukrainian deposit takers can meet the requirements for short-term withdrawals without problems.

The ratio of a Net open position in foreign exchange to capital was 89.61 % in 2017. Such value of the indicator means the significant influence of operations with foreign currencies and banking metals on the stability of the foreign exchange market. We can note the tendency to decrease. For the last three years, the value of the indicator has decreased by 46.42 pp. If we consider the trend for the entire investigated period,

when compared with 2013, we see that in 2017 the value of the indicator increased by 82.67 pp.

Table 3.5. Values of encouraged Financial Soundness Indicators for Ukrainian deposit takers till 2013 to 2017

No.	Encouraged Financial Soundness Indicators	Year				
		2013	2014	2015	2016	2017
1	Capital to assets	15.06	11.23	8.02	9.78	11.90
2	Large exposures to capital	172.05	250.04	364.14	308.27	208.31
3 3.1	Geographical distribution of loans to total loans: Domestic economy (Percent)	98.72	96.05	94.54	95.92	94.21
3.2	Geographic distribution of total loans: Advanced economies, excluding China (Percent)	1.18	1.66	2.85	2.19	2.83
3.3	Geographic distribution of total loans: Other emerging market and developing countries, including China (Percent)	0.10	2.29	2.62	1.89	2.96
3.4	Geographic distribution of total loans: Africa (Percent)	0.00	0.00	0.00	0.00	0.00
3.5	Of which: Sub-Sahara Africa (Percent)	0.00	0.00	0.00	0.00	0.00

continued table 3.5

3.6	Geographic distribution of total loans: Central and Eastern Europe (Percent)	0.03	0.01	0.00	0.00	0.00
3.7	Geographic distribution of total loans: Commonwealth of Independent States and Mongolia (Percent)	0.05	2.27	2.61	1.89	1.75
3.8	Geographic distribution of total loans: Developing Asia, including China (Percent)	0.00	0.00	0.00	0.00	0.00
3.9	Geographic distribution of total loans: Middle East (Percent)	0.00	0.00	0.00	0.00	0.00
3.10	Geographic distribution of total loans: Western Hemisphere (Percent)	0.03	0.01	0.00	0.00	1.21
4	Gross asset position in financial derivatives to capital	1.30	2.83	12.55	36.81	35.21
5	Gross liability position in financial derivatives to capital	0.13	0.27	0.19	0.19	0.07
6	Trading income to total income	3.83	14.26	21.10	8.97	7.00
7	Personnel expenses to noninterest expenses	41.04	35.48	36.14	34.53	32.11

continued table 3.5

8	Spread between reference lending and deposit rates (basis points)	383	540	772	600	681
9	Spread between highest and lowest interbank rates (basis points)	6 490	4 660	2 401	1 384	2 450
10	Customer deposits to total (noninterbank) loans	73.34	64.45	71.22	80.51	84.59
11	Foreign-currency-denominated loans to total loans	34.72	47.77	57.90	51.35	47.05
12	Foreign-currency-denominated liabilities to total liabilities	43.25	49.27	52.82	55.92	52.81
13	Net open position in equities to capital	n/a	n/a	n/a	n/a	n/a

* Compiled by Author based on NBU data [78]

The first encouraged Financial Soundness Indicators was Capital to assets ratio. Its value was 11.90 % in 2017. It means that almost 12 % of assets were funded by sources other than own. In the dynamics, the indicator generally decreased by 3.7 pp., that is a negative trend because it indicates a decrease in the degree of capital adequacy of the deposit takers sector.

The value of the large exposures to capital indicator during the investigated period is significant and exceeds 100 %. The minimum value was 172.05 % in 2013, and the maximum was 364.14 % in 2015. From 2016, the figure has slightly reduced and reached 208.31% in 2017 that indicates a high concentration of credit risk in Ukraine.

After the Geographic distribution of total loans ratio analysis, we can conclude that mainly Ukrainian deposit takers

are lending to the domestic economy. Because over the past five years the indicator value for this sector exceeds the 94 % mark. The maximum value was 98.72% in 2013, and the minimum was 94.21 % in 2017.

External lending in Ukraine is almost not developed. So, the biggest part of external loans in gross amount was provided to the market and developing countries, including China. The total value was only 2.96 % in 2017. On the second position is advanced economies, the total value was only 2.83 % in 2017. On the third place is the Commonwealth of Independent States and Mongolia with a mark of 1.75 % in 2017. Following is the Western Hemisphere – 1.21 %. In the dynamics for the listed geographic zones, this indicator had increased in the investigated period.

For Africa, Sub-Sahara Africa, Central and Eastern Europe, Developing Asia, including China and the Middle East, the share in total gross loans was 0.00 % in 2017. It should be noted that the share of Central and Eastern Europe in total gross loans amount was 0.03 % in 2013, and further decreased to 0.01 % in 2014 and to 0.00 % in 2015.

Gross asset position in financial derivatives to capital indicator has rapidly increased on 39.91 pp. from 1.30 % in 2013 to 35.21 % in 2017. Consequently, the risk level of deposit takers' gross asset position in financial derivatives to capita is steadily increasing. As for Gross liability position in financial derivatives to the capital indicator, its value is significantly smaller, only 0.07 % in 2017. Furthermore, during the investigated period there is a tendency to decrease. Over the past five years, the value of the indicator has decreased by 0.06 pp. It means that the level of risk of Gross liability position in financial derivatives to capital is insignificant and decreases.

Trading income to total income ratio of Ukrainian deposit takers was 7 % in 2017. Over the past three years, there has

been a significant decrease in the values of this indicator, in particular, 14.10 pp. It means a reduction in the share of income from trading operations relative to gross income. From the point of the overall dynamics view, we can state the slight increase of the indicator on 3.17 pp. from 2013 to 2017.

The share of personnel expenses in the total noninterest expense is more than one third that was 32.11 % in 2017. In general, we can note the tendency to reduce the value of the indicator, since in 2013 the figure was 41.04 %. For the analyzed period, the indicator of personnel expense to the total noninterest expense dropped by 8.93 pp., which should be a positive factor for increasing the profitability of the Ukrainian deposit takers.

Spread between reference lending and deposit rates was 681 basis points in 2017. It means that the difference between the weighted average reference rates for loans and deposits was 6.81 %. The maximum spread value was observed in 2015 and was 772 basis points, which is on 50.39 % more than in 2013.

Spread between highest and lowest interbank rates was 2450 basis points in 2017. It means that the difference between the maximum and minimum interbank rates charged by deposit takers in the domestic interbank market was 24.50 %. It should be noted that the value of the indicator in 2017 compared with the value in 2013 is smaller since it was 6490 basis points, which is on 62.25 % more than in 2017.

Indicator of customer deposits to total (noninterbank) loans was 84.59 % in 2017. It means that deposits of clients in Ukrainian deposit takers are only 15.41% less than loans. That is, 1 UAH of loans accounted for 84.59 kopecks of deposits. In the dynamics, this indicator increases. The total increase for the last five years is 11.25 pp.

Almost half of all loans of Ukrainian deposit takers are in foreign currency that is 47.05 % of the total loans values carry currency risk. Compared to 2015, the value of the Foreign-

currency-denominated loans to total loans indicator has decreased from 57.90 % to 47.05 % on 10.85 pp. If we consider the dynamics for the entire survey period from 2013 to 2017, then we can assert an increase in the indicator by 12.33 pp.

More than half of the total liabilities of Ukrainian deposit takers are in foreign currency, that is, currency financing is quite significant. The ratio of Foreign-currency-denominated liabilities to total liabilities was 52.81 % in 2017. We can note the general increase in the currency value in the financing, as in the period from 2013-2017, the indicator increased from 43.25 % to 52.81 % on 9.56 pp.

The NBU does not provide data about the values of the Net open position in equities to the capital indicator, because these data are not calculated at the time of writing.

The author calculated the values of Financial Soundness Indicators for other Ukrainian sectors for the period from 2013 to 2017 based on The International Monetary Fund's Guide on Financial Soundness Indicators [9] (Tab. 3.6).

Table 3.6. Values of Financial Soundness Indicators for other Ukrainian sectors from 2013 to 2017

No.	Sectors and Financial Soundness Indicators	Year				
		2013	2014	2015	2016	2017
Other Financial Corporations						
1	Assets to Total Financial System Assets, %	15.41	16.04	16.19	15.28	16.30
2	Assets to GDP, %	21.07	23.10	20.53	16.63	15.41
Nonfinancial corporations						
3	Total Debt to Equity, %	41.73	57.60	36.22	35.98	35.56
4	Return on Equity, %	-1.69	-43.23	-16.73	1.33	6.51

continued table 3.6

5	Earnings to Interest and Principal Expenses, %	-3.55	-65.55	-39.25	3.24	16.05
6	Net Foreign Exchange Exposure to Equity, %	10.90	21.00	16.22	12.59	10.38
7	Number of Bankruptcy Proceedings Initiated	n/a	n/a	n/a	n/a	n/a
Households						
8	Household Debt to GDP, %	13.21	13.48	8.83	6.85	5.84
9	Household Debt Service and Principal Payments to Income, %	321.64	349.35	282.50	225.87	184.63
Market liquidity						
10 a)	Average Bid-Ask Spread in the Securities Market, %	0.70	1.55	3.15	3.15	1.91
10 b)	Average Bid-Ask Spread in Foreign Exchange Markets, %	1.14	2.67	2.55	2.01	0.46
11	Average Daily Turnover Ratio in the Securities Market	1.39	1.59	1.35	1.16	0.22
Real estate markets						
12	Residential Real Estate Prices, %	n/a	n/a	n/a	102.1	104.7
13	Residential Real Estate Loans to Total Loans, %	5.46	6.68	6.32	5.59	4.45

continued table 3.6

14	Commercial Real Estate Loans to Total Loans, %	1.38	1.45	1.24	1.06	0.98

* Compiled by Author based on data [25, 64, 37, 27, 71, 72, 73, 74, 75, 70, 79, 18, 17]

According to data in Table 3.6, we can note the low significance of other financial corporations in the domestic financial system compared to deposit takers, as the ratio of other financial corporations" assets to total financial system assets was 16.30 % in 2017. That is, other 83.70 % of assets belong to Ukrainian deposit takers. This is due to the bank-centered financial system of the state.

The share of assets of other financial corporations in the country's GDP was 15.41 %, which is on 5.66 pp. less than in 2013. That is, the significance of other financial corporations decreased in comparison with the size of the economy as a whole.

Indicator of total debt to equity of nonfinancial corporations over the last five years has decreased by 5.81 pp. and was 35.56 % in 2017. Therefore, we can state the reduction of the debt burdens by 1 UAH of nonfinancial corporations" equity. So, in 2013, for 1 UAH of own capital accounted for 41.73 kopecks debt burdens, and 35.56 kopecks in 2017.

There is a positive dynamics in the efficiency of the equity capital use by nonfinancial corporations since the return on equity rate over the past three years had increased. So, in 2015 the indicator was -16.73 %, that means the loss-making activity of nonfinancial corporations, but in 2017 the indicator became positive and was 6.51 %. The lowest efficiency of the use of equity capital by nonfinancial corporations was observed in 2014 (-43.23 %).

The risk that non-financial corporations may not be able to meet their obligations was in the period from 2013 to 2015,

because in this period, the ratio of earnings to interest and principal expenses had negative values, which indicates the unprofitableness of nonfinancial corporations. However, in 2016 the situation was changed for the better and the indicator reached 3.24 %. In 2017, the dynamics continued and the value of indicator was 16.05 %, so the risk of nonpayment debts in this sector was decreased.

The tendency of nonfinancial corporations to exchange rate risk is low, as the ratio of the net foreign exchange exposure to equity was 10.38 % in 2017 that was 10.62 pp. less than in 2014. The level of resistance of this sector to foreign exchange risk was higher by 50.57 % in 2017 compared to 2014.

The NBU does not provide data about the number of bankruptcy proceedings initiated, as this data is not a pre-prepared and fixed product received or created by the NBU in the process of performing its functions.

The general level of household debt to GDP was 5.84 % in 2017. In dynamics, this indicator decreases. From 2013 to 2017, the reduction was 7.37 pp., which is a positive trend and indicates a reduction in the level of debt to GDP.

Households' potential to cover debt (Service and Principal Payments) is low, as the debt exceeded household income by 84.63 % in 2017. There is a general tendency to decrease the ratio of Household Debt Service and Principal Payments to Income. Because in 2013 household debt exceeded incomes by more than three times and the indicator was 321.64 %, and in the future, the value of the indicator falls to the level of 184.63 % in 2017.

In order to calculate the average bid-ask spread in the securities market, the data of the six largest participants in the stock market was analyzed. It was done to ensure that the results obtained were objective. Thus, the average bid-ask spread in the securities market was 1.91 % in 2017, which was on 1.21 pp. more than in 2013. In the foreign exchange market,

the average bid-ask spread was slightly lower and was 0.46 % in 2017. The value of this indicator decreased from 0.68 pp. compared to 2013. Therefore, it is possible to state the good level of liquidity, as well as the efficiency of the securities market and the currency market, given the narrow spreads.

The average daily turnover ratio in the securities market was 0.22 in 2017, which indicates a low intensity of securities purchase and sale operations. In addition, there is a negative tendency to decrease this indicator. During the analyzed period, the value of the indicator decreased by 1.17 pp.

Data about residential real estate prices indicator are available on the official website of the State Statistics Service of Ukraine only in the last two years. Therefore, we can state the rise in residential real estate prices in 2016 by 2.01 pp. relative to the previous one, as well as an increase in prices in 2017 by 4.7 pp. relative to the previous one.

The share of residential real estate loans in total loans was insignificant – 4.45 % in 2017, which is less than in 2013 at 1.01 pp. The share of Commercial Real Estate Loans in Total Loans was lower than the share of Residential Real Estate Loans and was 0.98 % in 2017. The overall decrease of this indicator was 0.4 pp., which may indicate a decrease in the volume of this type of lending.

Summarizing the analysis of the basic indicators of financial stability for Ukrainian deposit takers from 2013 to 2017, we can conclude that, in general, Ukrainian deposit takers are able to pay on time and in full to their obligations arising from trade, credit or other money transactions. In general, the share of risk-taking by lenders and depositors of banks decreases. There may be doubts about the ability of banks to cover losses due to inactive loans at the expense of capital.

The quality of the credit portfolio of Ukrainian deposit takers is low since more than half of total loans in it are inactive. The major share in gross loans belongs to resident

loans (more than 90 % in 2017), namely, loans to nonfinancial corporations (more than 70 % in 2017). The efficiency of assets and capital using by Ukrainian deposit takers is low. More than half of the gross income of Ukrainian deposit takers was formed at the expense of the interest margin. On 1 UAH of the gross income of Ukrainian deposit takers was 76.14 kopecks of noninterest expenses in 2017.

We can note the high liquidity of assets of deposit takers. In general, Ukrainian deposit takers can meet the requirements for short-term withdrawals without any problems. Operations on the sale and purchase of foreign currencies and bank metals can have a significant impact on the stability of the foreign exchange market.

Based on the analysis of the values of the encouraged Financial Soundness Indicators for Ukrainian deposit takers for the period from 2013 to 2017, it can be concluded that more than 10 % of the assets of deposit takers are financed by sources other than their own, and the degree of sufficiency of their capital decreases. Ukraine has a high concentration of credit risk. Mostly, deposit takers are lending to the domestic economy; external lending in Ukraine is almost not developed.

The level of risk of deposit takers positions for gross asset position in financial derivatives to capital is steadily increasing, while the level of risk of deposit takers positions for gross liability position in financial derivatives to capital is insignificant and decreasing. The share of income from trading in the total income of deposit takers is slightly increasing. The share of personnel expenses to noninterest expenses reached more than a third.

The spread between reference lending and deposit rates was 681 basis points in 2017. The spread between the highest and lowest interbank rates was 2450 basis points. In 2017 in Ukraine for 1 UAH of loans accounted for 84.59 kopecks of customer deposits in 2017. More than half of the aggregate

liabilities of Ukrainian deposit takers are in foreign currency, so currency financing is quite significant.

According to the results of the Financial Soundness Indicators analysis for other Ukrainian sectors for the period from 2013 to 2017, we can state the low significance of other financial corporations in the internal financial system in comparison with deposit takers. The significance of other financial corporations in comparison with the size of the economy as a whole has decreased.

The debt burden for 1 UAH of the equity of nonfinancial corporations is decreasing. There is a positive dynamics in the efficiency of the equity capital using by nonfinancial corporations. There is a risk that nonfinancial corporations may not be able to meet their obligations. The tendency of nonfinancial corporations to exchange rate risk is low. The household debt to GDP is decreasing, but households' ability to cover debt is low.

Given the narrow spreads, we can state the good level of liquidity, as well as the efficiency of the securities market and the foreign exchange market. The intensity of securities purchase and sale operations is low. Residential real estate prices in 2016 increased by 2.01 pp. relative to the previous year, and in 2017 there was an increase of 4.7 pp. relative to the previous. The share of loans for residential real estate in the total amount of loans is insignificant.

4. THE ROLE OF THE STATE IN THE PROCESS OF PROVIDING THE STABILITY OF THE FINANCIAL SECTOR

4.1. Theoretical concepts of financial supervision and specifics of their implementation in Ukraine

The development of Ukraine's economy depends on the efficiency of the financial market, because it is the sector that accumulates financial resources which are the source of investment, and ensures the mechanism of their redistribution. At the same time, activity in the financial market has certain risks that can destabilize the economic situation of the country in case they cannot be controlled. So it is especially important to strengthen the existing mechanism of financial supervision and create the new more effective one.

At the current stage, financial supervision is focused on the banking, insurance and stock markets, but there are a number of problems associated with ensuring proper and comprehensive supervision. In particular, in terms of crisis, the unfavorable external environment affects the reduction of financial institutions" efficiency, the deterioration of their financial situation and the consequent appearance of a large number of bankruptcies among banks and insurance companies. Thus, it becomes more actually to study the theoretical foundations and the current state of financial supervision with the perspective to improve it further.

There are different approaches to foreign and domestic authors to define the economic category "financial supervision". The author considers some of them.

In the opinion of John McAndrew, Intisar Abu Khalaf and other authors of the "Financial Supervision Instruction in the Security Sector" from Geneva Centre for the Democratic Control of Armed Forces (DCAF), "financial supervision" in

the security sector is a key tool to ensure that the process of spending state funds, which is allocated by the state for the safety of people, is transparent and accountable [6].

In the "Guide to Parliaments", published by the Global Partners Governance, the term "financial supervision" is interpreted as one of the most ancient functions of the parliament, which takes the central role to determine priorities in the policy and providing services to voters [14]. Also, the role of "financial supervision" has been determined in the Guide as considering such issues as:

– How wise and properly is money spent?

– Are these costs effective?

– Is the profit received due to spent funds? If not, why? What can I do to fix the situation?

– Have the funds been spent for the purposes for which they were asked?

Also, the role of financial supervision is to prevent and detect corruption and misuse of public funds. One more is to ensure the verification of government accounts by an independent Supreme Audit Institution and to submit its reports to Parliament for consideration [14].

Another definition of "financial supervision" in foreign literature is provided by the authors Donato Masyandaro and Mark Quintin. They point out that financial supervision must ensure that financial institutions comply with the regulatory framework and impose sanctions on those institutions that do not comply with the rules and regulations [4].

U.S. Agency for International Development provides the following definition of "financial supervision": "This is studying and monitoring of financial institutions - usually state ones - to ensure compliance with financial rules" [11].

According to V. Kremen, financial supervision should be understood as the activities of the authorities on the basis of their responsibility for monitoring and overseeing the activities

of financial intermediaries and the functioning of the financial sector. This is required to ensure that financial intermediaries, who are operating in the country, comply with the requirements for their activities and the stability of the financial sector [55].

V. Bochan proposes to define the concept of "financial supervision" as a form of activity of state bodies for ensuring legality in the financial sector, a set of measures taken by the supervisory authorities to ensure the full compliance of financial institutions" activities with the requirements, a system of formal and informal ways of detecting non-compliance or violation of the conditions of activity by financial institutions [22].

It is required to define the difference between the concepts of "financial sector regulation" and "financial supervision" since these concepts is often used as exchangeable.

According to scientists S. Naumenkova and V. Mishchenko, the term "financial sector regulation" is understood as the process of establishing and following the certain norms and rules of activity of financial institutions. "Financial supervision" should be treated as a form of activity of state authorities on ensuring the legality of business, transparency, and stability of doing business by individual institutions [59].

The author of this paper is of the opinion that financial supervision is a derivative, secondary to financial regulation since even effectively organized supervision cannot save the financial sector from shocks and crises if the established norms are imperfect or don't match the time and conditions of operation and development of the financial sector.

According to Article 1 of the Law of Ukraine "On Financial Services and State Regulation of Financial Services Markets": "state regulation of financial services markets is implementation by the state of a set of measures to regulate and oversee the financial services markets in order to protect the users of financial services and prevent crises". Such an

interpretation of the concept of "regulation of financial services markets" makes it equal to the meaning of "financial supervision" [35].

Scientists S. Naumenkova and V. Mishchenko believe that the purpose of regulation and supervision of the financial sector's functioning is to hold a unified state policy in the financial sector to strengthen stability, increase the efficiency of functioning, maintain market confidence, promote competition, protect the interests of investors and consumers of financial services, as well as ensuring the transparency and openness of financial services markets [59].

Summarizing the existing scientific and methodological approaches for the definition of the purpose of financial supervision, the main objective of supervision over the financial sector of the country is to ensure the stability of the functioning and development of the financial system and the financial sector.

The tasks of financial supervision necessary for the realization of the main goal are:

– ensuring a competitive environment in the financial sector, in particular in the financial market and in the financial services market;

– ensuring the proper protection of the rights of investors and consumers of financial services;

– transparency of financial sector policy at the macro level and levels of each financial institution;

– ensuring an adequate level of standardization and professionalism in the financial sector.

The object of financial supervision is a set of financial institutions that carry out activities in the financial sector.

The subject of financial supervision is the quantitative indicators and quality characteristics of the activities of financial institutions and the financial sector in the whole.

Considering that financial supervision is focused on reducing the system risk in the financial sector, micro- and macroprudential financial supervision is distinguished. Today's microprudential supervision is more traditional and aimed at ensuring the stability of financial institutions and preventing their bankruptcy. Macroprudential supervision is a monitoring of the stability of the financial sector in the whole and includes the analysis of risks arising from collective action taken by financial institutions. It also monitors the tendency of the financial system for potential shocks and analyses the macroeconomic consequences of problems in the financial sector [53].

This means that financial supervision is a set of measures applied by the authorities in order to control the compliance of financial intermediaries with the statutory requirements for their activities.

The main international organizations involved in the development, implementation, and improvement of financial supervision are:

– The Basel Committee on Banking Supervision (BCBS);
– The International Monetary Fund (IMF);
– The Financial Stability Institute (FSI);
– The International Association of Insurance Supervisors (IAIS);
– The International Organization of Pension Supervisors (IOPS);
– The World Council of Credit Unions (WOCCU);
– The International Organization of Securities Commissions (IOSCO);
– The Joint Forum (previously known as The Joint Forum on Financial Conglomerates).

The Basel Committee on Banking Supervision is a leading organization that arranges discussions on the issues of improving banking supervision, coordinates banking

supervision activities and prepares relevant agreements on these issues. The main activity of the Committee is the development of international standards for regulation and supervision of the banking sector [27].

The IMF monitors the implementation of established rules of conduct in the field of monetary and financial relations and provides resources to support the balance of payments deficits for those countries that need it [37].

The main objective of the Financial Stability Institute is to stabilize the world financial system and international financial institutions, primarily through the help in the implementation of constant prudent supervision.

The IAIS is focused on encouraging the cooperation between national insurance market supervisory authorities. It is also interested in developing standards for insurance supervision and facilitating their implementation by national insurance supervisory authorities [63].

The main objective of IOPS is to improve the quality and effectiveness of oversight activities of non-state pension funds around the world. This helps develop and increase their operational efficiency and increase the level of protection of this source of income for pensioners [77].

The WOCCU is a global trade association and agency for the development of credit unions and acts on behalf of the global system of credit unions to international organizations. It works with national governments to improve legislation and regulation [82].

The International Organization of Securities Commissions unites the national security commissions that supervise and regulate this segment of the financial market. Also, it has the following objectives [84]:

– To promote the implementation of high standards of regulation in order to ensure the normal, efficient and fair functioning of financial markets;

– To exchange the information on regulatory experience for promoting the development of national securities markets;

– To combine the efforts for developing standards and effective supervising of international securities transactions;

– To assist in ensuring the integrity of the financial market through the constant introduction of appropriate standards and counteracting possible abuse.

At the international level, supervision of the activities of financial institutions and the financial sector, in general, is regulated by the following normative and legal documents:

– Recommendations and regulatory documents of the Basel Committee, the main of which are "International Convergence of Capital Measurement and Capital Standards" (Basel I, 1988), "Core Principles for Effective Banking Supervision" (1997), "Amendments to the Basel Accord about the Capital" (the most famous is the "Amendment to Take Into Account Market Risks", 1996) and the "The New Basel Capital Accord" (Basel II, 2004), the advisory documents proposed as amendments – "Revisions to the Basel II market risk framework" ("Basel III", 2010) [59];

– "Financial Soundness Indicators (FSI) Concepts and Definition" developed by the International Monetary Fund to conduct macroprudential analysis and reflect the current financial status and stability of financial institutions of the country and their counterparties from sectors of non-financial corporations and households [8];

– Standards of the International Monetary Fund on the structuring of the financial sector;

– Recommendations and regulatory documents of the IAIS, the main of which are "Core Principles for Effective Banking Supervision" (1997), "Supervisory Standard on Licensing", "Supervisory Standard on On-site Inspections", "Supervisory Standard on Derivatives", "Principles Applicable to the Supervision of International Insurers and Insurance Groups and

their Cross-border Business Operations (Insurance Concordat)","Guidance on Insurance Regulation and Supervision for Emerging Market Economies";

– Recommendations of the IOPS, the most important is "Objectives and Principles of Securities Regulation";

– Recommendations of the Joint Forum, like the "Supervision of Financial Conglomerates" (1999) and "Risk Concentration Principles" (1999);

– Directives of the European Union. The most important are: "Solvency I" and "Solvency II". They establish requirements for capital adequacy and risk management in insurance. Also, the important role belongs to Directive 2002/87/EC on the supplementary supervision of credit institutions, insurance, and investment firms in a financial conglomerate [59].

Nowadays, Ukraine has a three-tiered model of regulation and supervision of the financial sector. According to this model, the competence of the National Bank of Ukraine includes the regulation and supervision of banking institutions. The State Commission for the Regulation of Financial Services Markets of Ukraine regulates and supervises non-bank financial institutions. The National Securities and Stock Market Commission of Ukraine is responsible for the market of securities.

The National Bank of Ukraine is the central bank of Ukraine and a special central authority of state administration. Its legal status, tasks, functions, powers, and principles of organization are determined by the Constitution of Ukraine, the Law of Ukraine "On the National Bank of Ukraine" and other laws of Ukraine. In accordance with the Constitution of Ukraine, the main function of the National Bank is to ensure the stability of Ukraine's monetary unit. According to Art. 6 of the Law of Ukraine "On the National Bank of Ukraine" the main function of the National Bank is to achieve and maintain price stability

in the state. Also, within the limits of its power, the National Bank of Ukraine should maintain the stability of the banking system [33].

Among the 29 functions of financial regulation and supervision, as defined in Art. 7 of the Law of Ukraine "On the National Bank of Ukraine", the National Bank of Ukraine has the following important functions [33]:

– Establishing the rules for banks for carrying out of banking operations, accounting and reporting, protection of information, funds, and property;

– Banking regulation and supervision on an individual and consolidated basis;

– Approving of the bank statutes and their changes, licensing of banking activities and transactions in cases defined by law, conducting the State Register of Banks, the Register of Audit Firms, which have the right to conduct audits of banks.

The State Commission for the Regulation of Financial Services Markets of Ukraine is a state collegiate body subordinated to the President of Ukraine, accountable to the Verkhovna Rada of Ukraine. Among the list of the 7 tasks of the National Commission, defined in Art. 27 of the Law of Ukraine "On Financial Services and State Regulation of Financial Services Markets", the following objectives are related to financial regulation and supervision [35]:

– Strategy development and growth implementation and the resolution of systemic issues of functioning of financial services markets in Ukraine;

– Implementation of international rules for financial services market development;

– Protection of the rights of users of financial services through the use, within its competence, of enforcement measures in order to prevent and stop noncompliance on the financial services market.

The National Securities and Stock Market Commission of Ukraine (SSMCS) is a state collegiate body subordinated to the President of Ukraine, accountable to the Verkhovna Rada of Ukraine. SSMCS conducts state regulation of the securities market.

Among the 11 tasks of SSMCS, specified in paragraph 3 of the Regulation "On the National Commission on Securities and Stock Market", the following objectives belong to financial regulation and supervision:

– Protection of investors" rights through taking measures to prevent and terminate violations of the legislation on the securities market and joint-stock companies law, application of sanctions for violation of legislation within the limits of their authority;

– State regulation and control of the issuance and circulation of securities and derivatives on the territory of Ukraine;

– State regulation and control in the field of joint investment;

– State regulation and control in the field of accumulative pension provision;

– State regulation and supervision in the field of prevention and counteraction to legalization (laundering) of proceeds from crime or financing of terrorism;

– Supervision on a consolidated and non-consolidated basis for non-bank financial groups and their subgroups.

Paragraph 4 of the Regulation "On the Ministry of Finance of Ukraine" states that the Ministry of Finance of Ukraine, in accordance with its tasks, forms holds a unified state financial policy for the development of the financial services market, development of state banks, state mortgage institutions, and other financial institutions. In order to ensure the implementation of functions related to the regulation of

financial services markets, the Department of Finance has been established within the structure of the Ministry of Finance [65].

The Ministry of Economic Development and Trade of Ukraine, in accordance with the tasks entrusted to it, analyses the influence of the banking services market, currency, stock, insurance, and other financial services markets on the economic development of the state [80].

The main normative and legal acts regulating supervisory activities in the financial sector in Ukraine are:

– Law of Ukraine "On Financial Services and State Regulation of Financial Services Markets";

– Law of Ukraine "On the National Bank of Ukraine";

– Law of Ukraine "On Banks and Banking Activity";

– Law of Ukraine "On State Regulation of the Securities Market in Ukraine";

– Law of Ukraine "On Securities and the Stock Market";

– Law of Ukraine "On Insurance";

– Law of Ukraine "On Non-State Pension Provision";

– Law of Ukraine "On Financial-Credit Mechanisms and Property Management in the Construction of Housing and Real Estate Operations";

– Law of Ukraine "On Credit Unions";

– Law of Ukraine "On the Cabinet of Ministers of Ukraine";

– Law of Ukraine "On the Principles of State Regulatory Policy in the Field of Economic Activity";

– The Civil Code of Ukraine (Chapter 3 "Protection of Civil Rights and Interests", Chapter 49 "Ensuring the performance of the obligation", Chapter 67 "Insurance", Chapter 71 "Loan, Credit, Bank Deposit");

– Resolution No. 368 "On Approval of the Instruction on the Procedure for Regulating the Activities of Banks in Ukraine";

– Comprehensive Program of Ukrainian Financial Sector Development until 2020.

In general, for the purpose of the proper performance of their functions, the financial regulatory authorities may use the following instruments:

– The right of legislative initiative.

– Preliminary control of the admission of participants to the market at the stages of licensing, investment, etc.

– Control of the current activity of financial market entities.

– The right to take measures of influence and to impose sanctions in case of detection of violations.

4.2. The evolution of the financial sector and the supervision of financial markets in Ukraine

There are five stages of development of the financial sector of Ukraine:

1) 2005-2006 – growth;
2) 2007-2008 – peak and downturn;
3) 2009-2011 – crisis and post-crisis recovery;
4) 2012-2014 – peak and downturn;
5) 2015-2016 – crisis [84].

The first stage of growth of the financial sector of Ukraine (2005-2006) can be characterized by the following trends:

– Formation of market economy methods;

– Reduction of inflation to 11 %;

– Activation of the activities of insurance companies, credit unions, non-state pension funds, financial companies, asset management companies, pawnshops;

– The emergence of banks with foreign capital in the banking market;

– The high growth of the main indicators of activity of financial market participants;

– Improvement of the legal and regulatory framework for financial supervision.

The second stage of the financial sector development in Ukraine (2007-2008 - peak and downturn) is characterized by the following trends:

– The appearance of the first signs of the financial crisis;

– Substantial increase of foreign capital in the banking market;

– Active issuing of shares and corporate bonds at the foreign securities market;

– Dynamic development of the banking system and a boom in lending;

– Narrowing the deposit base of banks and lack of external financing;

– Slowing down the growth rates of the majority financial intermediaries" performance.

The third stage of financial sector development (2009-2011 – crisis and post-crisis recovery) is characterized by the following trends:

– Reduction of the number of banks, the presence of the state in the banking market;

– Decrease in the volume of assets of banking institutions, a decrease in lending and deposits, an increase in the share of overdue and bad debts in the number of loans granted;

– Negative dynamics of indicators of credit unions" activity;

– Reduction of insurance reserves, gross and net insurance premiums, gross and net insurance payments of insurance companies;

– Increase in the number of pawnshops, an increase in the value of their assets, equity capital, financial loans granted by them on bail, and the value of the property taken as a pledge;

– Increasing the volume of NPF assets, the number of contracts, participants, pension contributions and payments, lower growth rates;

– Expansion of activity of financial companies;

– Decrease in the conversion rate of the hryvnia to the US dollar, an increase in the devaluation and inflation expectations of households and non-financial corporations, a reduction in savings;

– A gradual increase in the share of Government bonds in the securities market;

– Increasing the volume of assets, loans, deposits, and capital of banking institutions at the end of the period, reducing the share of overdue and bad debts in the number of loans granted.

The fourth stage of financial sector development (2012-2014 – peak and downturn) is characterized by the following trends:

– Reducing the number of banks, introducing new risk management tools and improving corporate governance mechanisms in banks;

– Improvement of the dynamics of assets, loans, investments in securities, capital, funds of economic entities and individuals;

– Reorganization of the Individual Deposit Guarantee Fund;

– Further decrease of the capital of banking institutions, reduction of deposits of individuals, a significant increase in the volume of refinancing of banks at the end of the period;

– Devaluation of the national currency;

– Low rates of expansion of insurance companies, improvement of most indicators of insurance companies and reduction of gross insurance premiums and authorized capital;

– Reduction of assets and volume of equity capital of pawnshops, termination of growth of granted financial loans, and cost of the property taken into a pledge;

– Increasing of assets and volume of financial services provided by financial companies;

– Improvement of performance indicators of credit unions (number of members, the volume of capital, income, assets);

– Increase of trade volumes, exchange contracts, and capitalization of listed companies in the securities market, reduction of issue of shares and bonds.

The fifth stage of the financial sector development (2015-2016 – crisis) is characterized by the following trends:

– Decrease in the performance of banking institutions at the beginning of the period and growth at the end of the period, increase of the state's share in the banking market;

– Decrease in the volume of assets of insurance companies, an increase in the number of insurance contracts at the beginning of the period and a decrease in the end, a positive trend for the formed insurance reserves, gross insurance premiums, and gross insurance payments;

– Increasing of business activity of pawnshops;

– Increase in the number of pension contracts, the number of pension contributions and retirement benefits;

– Decrease in credit unions" activity at the beginning of the period and a positive tendency for capital, income, and loans granted by credit unions at the end;

– Increasing the volume of financial services provided by financial companies, growth of assets at the beginning of the period and decrease in the end;

– Reduction of trade volumes, exchange contracts, issue of bonds, capitalization of listed companies in the securities market and increase in the volume of shares' issuing.

Features of the improvement and transformation of financial supervision in different periods of the financial sector's development can be described as follows [84]:

1) 2005-2006: an increase in requirements to regulatory capital of banks in carrying out separate operations; improvement of the calculation of banks' economic standards, related to insiders; improvement of the formation of banks' reserves for foreign currency lending operations and provisions for accounts receivable; change the order of banks' ratings on the CAMELS system; ordering the activities of non-resident insurers;

2) 2007-2008: the improvement of the order of formation and usage of reserve on bank lending operations; changes in determining the borrower's financial position and credit category; raising requirements for regulatory capital of banks and introducing a new regulatory capital adequacy ratio; change in the order of formation of reserves for banks' operations with securities; improvement of corporate governance in banks; change in the order of financial rehabilitation, liquidation and reorganization of banks; measures to increase capitalization of banks; specification of requirements for rating, conclusion of contracts, realization of intermediary activity of non-resident insurers; improvement of the order of disclosure of information about the activities of non-state pension funds and insurance companies; improvement of credit unions' activity standards; activation of work on increasing the institutional capacity of supervisors;

3) 2009-2011: increase in the requirements to the authorized capital of banks; revision of the procedure for taking into account subordinated debt in the bank's capital; change in the order of reorganization of banks and work of the interim

administration; improvement of calculation of capital adequacy ratios, liquidity and investment; change in the order and causes for scheduled and unscheduled inspections; change in the rules for the formation, accounting and placement of insurance reserves for non-life insurance companies; restriction of the amount of financial institutions' activity to provide certain types of financial services;

4) 2012-2014: an increase of capital requirements for newly created banks, as well as introduction of phased growth of banks' regulatory capital; introduction of a procedure for defining and supervising the activities of banking groups and systemically important banks; improvement of the defining of economic standards of banks and improvement of corporate governance in banks; improvement of requirements for financial institutions' information disclosure and clarifying the list of financial services;

5) 2015-2016: banks' categorization by business models and complementing the CAMELS system with a new component; strict control over banks' transactions with related parties; improving the approach for banks to determine the size of credit risk; improvement of financial regulations of financial institutions; introduction of supervision on a consolidated basis for non-bank financial groups; improvement of information disclosure by financial intermediaries; the establishment of mandatory criteria and standards for the adequacy, diversification, and assets quality of insurance companies.

4.3. Key trends in financial supervision in Ukraine

In conditions of economic and political instability, the functioning of the banking system is under pressure from macroeconomic and institutional risks. At the same time, if the stability of the banking market is broken, then it has negative consequences for the development of the whole economy. The

constant change in operating conditions, the influence of external factors, and the need for internal adaptation lead to changes in the banking system in general, and in the mechanism of its financial supervision in particular. In this regard, the author considers that it is necessary to provide an analysis of financial supervision of banks.

In recent years bankruptcy of banking institutions has spread due to the crisis in the economy, the instability of the banking system and the increase of the NBU requirements to the statutory capital ratio. Figure 4.1 shows the dynamics of the number of operating banks for the period from 2013 to 2017. There is a clear tendency to reduce the number of operating banks. During the analyzed period their number decreased from 180 to 82: about 54 % of banks have left the market since 2013. Such a decrease is caused by an increase in the requirements for the statutory capital standard, as well as a complex economic and political situation.

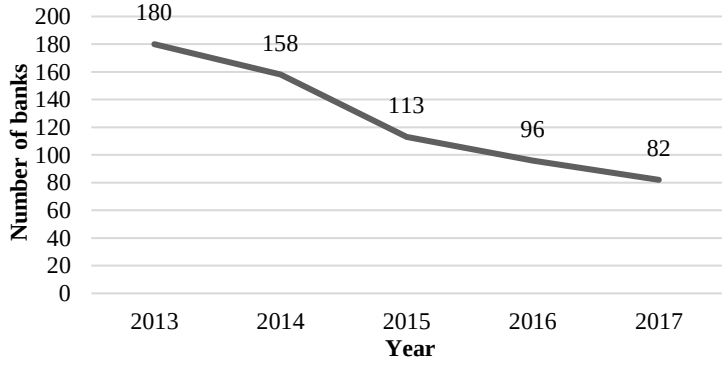

Figure 4.1. Dynamics of the number of operating banks in Ukraine for the period from 2013 to 2017, built by the authors based on data [64]

As of 2017, there were 9 banking institutions in the status of liquidation. Banks in liquidation and their customers' funds are shown in Table 4.1.

Table 4.1. Banking institutions in liquidation and their clients' funds by 2017, built by the author based on data [62, 64]

No.	Name of the bank	Clients' funds by 01.01.2017, thousands of hryvnias
1	PAT "Platinum Bank"	6893752.20575
2	PAT "Bank Narodnyi Kapital"	64471.37831
3	PAT "Fortuna-bank"	635693.06892
4	PAT "VEKTOR BANK"	78010.68299
5	PAT "FINBANK"	120269.1072
6	PAT "Diamantbank"	4492952.91204
7	AKB "NOVYY"	1128555.33516
8	PAT "KB "Hefest"	2.45493
9	PAT "Bank Bohuslav"	519075.17762
Total		13932782.3229

As per Table 4.1, the amount of clients' funds in deposits with banks in liquidation is more than 13 billion. This is a significant amount, which will be repaid in its entirety since the Deposit Guarantee Fund can only return 200 thousands of hryvnas per person. Funds repaying to legal entities is provided in accordance with the statutory priority. Some of them could not receive it to the expiration of monetary resources, therefore bankruptcy of banks has a large negative social and economic effect, as it undermines financial stability and welfare as citizens and business entities.

The author analyzed the rate of complying of banks with the economic standards of the NBU (Tab. 4.2).

Table 4.2. Value of economic norms in the system of Ukrainian banks for the period from 2013-2017, built by the author based on data [64]

Normative	Year				
	2013	2014	2015	2016	2017
N1 - Regulatory capital (UAH 500 million)	204975.9	188948.9	129816.9	109653.6	112154.5
N2 - Regulatory capital adequacy ratio (≥10),%	18.26	15.60	12.31	12.69	15.35
N3 - Total Asset-to-Capital Ratio (≥9),%	13.98	x	x	x	x
N3-1 - Total Debt-to-Capital Ratio (≥10),%	17.41	x	x	x	x
N4 - Quick Liquidity Ratio (≥20),%	56.99	57.13	78.73	60.79	45.61
N5 - Current Liquidity Ratio (≥40),%	80.86	79.91	79.98	102.14	106.67
N6 - Short-term Liquidity Ratio (≥60),%	89.11	86.14	92.87	92.09	96.52
N7 - Single Counterparty Exposure Limit (≤25),%	22.33	22.01	22.78	21.48	20.61

continued table 4.2

N8 - Great credit risks ratio (no more than 8 times the size of regulatory capital)	172.05	250.04	364.14	308.27	232.12
N9 - Ratio of the maximum amount of loans, guarantees, and sureties given to one insider (≤5),%	0.36	0.13	x	x	x
N9-1 - Ratio of the maximum amount of credit risk for operations with related persons (≤25),%	x	17.40	31.19	36.72	20.05
N10 - Ratio for the maximum total amount of loans, guarantees, and suretyship provided to insiders (≤30),%	1.63	1.37	x	x	x

continued table 4.2

N11 - Ratio of investing in securities separately for each institution (≤15),%	0.04	0.01	0.002	0.001	0.000005
N12 - Total investment ratio (≤60),%	3.15	2.97	1.10	0.60	0.32

Analyzing the data in Table 4.2, we can note that the normative minimum size of regulatory capital, which should be equal to UAH 500 million (until July 11, 2024), is implemented on the average throughout the system during the period. That means that banks are able to cover the negative effects of the various risks that they assume during their operations and ensure the protection of deposits, financial stability, and stability of banking activities.

The regulatory capital adequacy ratio, which should be at least 10 %, is also complied with the system during the period from 2013 to 2017. Banks have the ability to pay back fully and in time their debts, which are caused by trade, credits or other monetary transactions.

Total Asset-to-Capital Ratio should be at least 9 %. In 2013, this ratio was within the norm of 13.98 % as of 2013. In general, the banks had sufficient regulatory capital required for them to carry out active operations. The N3 has no more calculated since 2014.

Total Debt-to-Capital Ratio determines the adequacy of the bank's own funds to fulfill its obligations to depositors and creditors. Analyzing the data in table 8, we can state that the value of the indicator is complied with normative and it is

17.4 % ≥ 10 % as of 2013. The normative N3-1 has also no longer calculated since 2014.

For the analyzed period, the Quick Liquidity Ratio decreased by 11.38 pp., however, it is generally within the normal range (≥ 20 %). As of 2017, N4 is 45.61 %. Consequently, banks are able to ensure the timely execution of their monetary obligations at the expense of highly liquid assets. The Current Liquidity Ratio dynamically increases and its increase in the period from 2013 to 2017 was 25.81 pp. The N5 for the analyzed period significantly exceeds and complies with the norm of 40 %. As of 2017, the figure is 106.67 %, which means that the banks have the minimum required amount of assets to ensure the implementation of the current amount of liabilities within one calendar month. The Short-term Liquidity Ratio defines the minimum required amount of assets to cover banks' debts within one year. Analyzing the data presented in Table 4.2, we can conclude that N6 for the period from 2013-2017 exceeds and complies with the threshold of 60 %. For the analyzed period, the index has increased: the ratio has increased by 8.32 %, and its value – by 96.52 % as of 2017.

The Single Counterparty Exposure Limit during the period from 2013 to 2017 is within 25 %. That means that the maximum possible level of the type of credit risk, specified by the NBU in the banking system, is not exceeded. The positive trend is reducing of this indicator from 22.33 % in 2013 to 20.61 %. During the analyzed period the great credit risks ratio increased by 60.07 pp., however, the 8-fold size of the regulatory capital of N8 does not exceed, which means that the concentration of credit risk for a particular counterparty or a group of related counterparties is generally on the system at an acceptable level.

The normative of the ratio of the maximum amount of loans, guarantees, and sureties given to one insider, was calculated by

the NBU till 2014 and it was set up to limit the risk that occurs when dealing with insiders, which may have a direct or indirect effect on the bank's operations. Based on the data in Table 8, we can note that the value of N9 for 2013-2014 did not exceed even 1 % and as of 2014 it was 0.13 %, which is fully aligned with the norm. The ratio of the maximum amount of credit risk for operations with related persons is calculated from 2014 and exceeds the regulatory value of 25 % at 11.72 pp. as of 2016, i.e. the requirements for insider credits in the system as a whole were significantly violated during this period, but later the value decreased to 20.05 % in 2017, which is fully aligned with the norm. The ratio for the maximum total amount of loans, guarantees, and suretyship provided to insiders was calculated up to 2014. The value of N10 during the accounting period corresponds to the normative (≤ 30 %). The aggregate amount of all risks for insiders is at an acceptable level.

The ratio of investing in securities separately for each institution does not reach even 0.1 % during the analyzed period and decreases in the dynamics. For the period from 2013 to 2017, the value of N11 decreased from 0.04 % to 0.000005 %. In general, the risk associated with investing in shares, units, shares and investment certificates of a separate legal entity is at an acceptable level. The normative of total investment ratio is established in order to limit the risk associated with the bank's investment activity. It should be noted that the value of N12 in the last 5 years has significantly decreased from 3.15 % in 2013 to 0.32 % in 2017, which shows that investment activity is performed by banks in small volumes. The risk associated with it is small.

The given analysis of the implementation of the economic normative of the NBU by commercial banks during 2013-2017 makes it possible to conclude that, in general, commercial banks comply with the requirements. In order to ensure the financial reliability of banks and protect the interests of

depositors, creditors, the National Bank in accordance with the established order obliges banks to comply with approved economic standards. The commercial bank's activities are based on tough supervision of the National Bank of Ukraine, which approves the relevant laws and regulations, which are governing banks' activities [83].

The insurance market is an important part of the financial market of Ukraine. As well as other components, it is under the pressure of negative external economic factors, such as imperfect regulatory framework, non-profitability of certain types of insurance, low competitiveness of insurance companies compared to banks. The indicated negative factors considerably affect the development of the insurance market, therefore, there is a need to increase the efficiency of its functioning and improve the financial supervision mechanism for it. That is why the author considers that it is necessary to analyze the current state of the insurance market.

Figure 4.2 shows the dynamics of the number of existing insurance companies for the period 2013-2017.

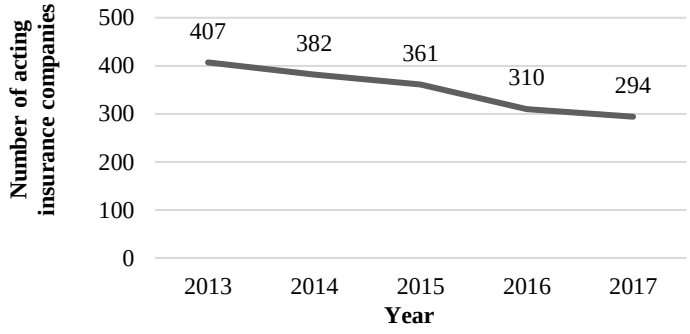

Figure 4.2. Dynamics of the number of existing insurance companies in Ukraine for the period from 2013 to 2017, built by the author based on data [51]

Analyzing the data shown in Figure 4.2, it can be noted that the number of existing insurance companies in the last five years decreased by 113 that is about 28 % of insurers left the market.

It should be stated that in 2017 the National Commission for State Regulation of Financial Services Markets revoked the licenses and excluded information about 10 insurance companies from the State Register of Financial Institutions. Among the insurers whose licenses were canceled, there were the following: PrAT SK "PLANETA STRAKHUVANNYA", TDV "SK" Alternative ", PAT "Kyivskyi Strakhovyi Dim", PAT "Yevropeiskyi Strakhovyi Soiuz", TDV "IC "Financial expert", PrAT "SK" Dim Strakhuvannia", PrAT "SK "Salamandra-Ukraina", TzDV "SC" UNITI", PAT "LEMMA CITY SERVER", PAT "DEKA INSURANCE" [41].

The causes for suspending the license are violations of the provisions of the regulatory acts of the National Commission for State Regulation of Financial Services Markets, as well as non-fulfillment of licensing conditions. The reason for the elimination of such a number of insurance companies may be the fact that TOP 50 life insurance companies and TOP 100 insurance companies cover about 100 % of gross premiums [52], which means that only about 150 companies out of 361 actually operate, while the others are "Pocket" and inactive.

It is also likely that the situation in the banking market also affects the activities of insurers through communications with banks-converters. In addition, the funds, which are necessary to ensure the solvency of the market, are placed on deposits in banks and are not covered by guarantees. Also, the increase of tariffs for risks reinsurance for the territory with a high probability of insurance events has a negative impact. One more problem for insurers is the prohibition to transfer payments in foreign currency abroad, introduced by NBU"s Regulation No. 540, which creates the inability to reinsure

risks in foreign markets and the potential increased loss-making or refusal to pay for an insurance events chain.

For a more detailed analysis of the situation on the insurance market, we selected five insurance companies from the rating of the largest insurers in Ukraine: PAT NASK "ORANTA", PAT SK "Providna", PAT SG "TAS", PAT "PZU Ukraina", PAT SK "UNIKA" [69]. We also selected five insurance companies from the list of insurers that were liquidated in 2017: PrAT "SK "Dim Strakhuvannia", PAT "Kyivskyi Strakhovyi Dim", PAT "Yevropeiskyi Strakhovyi Soiuz", PrAT "SK "Salamandra-Ukraina", PrAT SK "PLANETA STRAKHUVANNYA" [40]. We calculated the early warning tests to compare the actual financial performance of insurers with the indicators defined by the National Commission for State Regulation of Financial Services Markets, their generalization and risk assessment of insurers' activities [68]. Calculations are given in tables 4.3 and 4.4.

Table 4.3. The value of indicators of the early warning test for stable insurance companies of Ukraine by 2016

Indicator	Stable insurance companies				
	PAT NASK ORANTA	PAT SK Providna	PAT SG TAS	PAT PZU Ukraina	PAT SK UNIKA
1.Indicator of receivables	8.24	25.34	23.98	93.01	24.67
2.Asset liquidity index	9.90	114.17	54.68	2.39	2.32
3.Indicator of insurance risk	195.08	164.87	172.85	228.16	219.12
4.Reversal solvency indicator	159.51	73.60	12.38	430.74	193.20
5.Rate of return	14.79	10.23	40.01	26.32	21.68

continued table 4.3

6.Indicator of insurance coverage	32.79	53.10	52.92	53.74	44.85
7.Indicator of capital changes	38.05	10.63	40.27	51.87	131.22
8.Indicator of changes in the number of net bonuses for all policies	11.04	14.91	23.18	24.78	9.86
9.Indicator of independence from reinsurance	92.17	95.79	87.34	46.31	80.95
10.Indicator of the ratio of net insurance reserves to capital	121.71	61.91	96.24	128.62	101.25
11.Return on investment	10,68	0,00	57,76	19,06	12.35

Analyzing the data in Table 4.3, we can conclude that, according to the indicator of receivables, almost all of the stable insurance companies are at a high level, since the values fall in the range from 0 to 50 according to the rating scale. For example, in PAT NASK "ORANTA" only UAH 0.08 of accounts receivable is UAH 1 of capital. Only the PAT "PZU Ukraina" receivables indicator exceeded the indicated interval and amounted to 93.01%, which corresponds to the marginal financial condition.

According to the asset liquidity index, PAT SK "Providna" exceeds the 95 % rate, which corresponds to a stable financial state. The other four stable insurance companies have an unsatisfactory financial condition due to the asset liquidity index since the indicator is less than 65 %. PAT NASK "ORANTA", PAT SG "TAS", PAT "PZU Ukraina" and PAT SK "UNIKA" have insufficient liquid assets to repay their

obligations. That is why there is a real threat of violation of the financial stability of the company.

The Indicator of insurance risk for three insurance companies ranges from 100 % to 200 %, which corresponds to a satisfactory financial condition: in PAT NASK "ORANTA" index is 195.08 %, in PAT SK "Providna" – 164.87 %, in PAT SG "TAS" – 172.85 %. The value of the credit risk of these three insurance companies is quite high, for example, in PAT NASK "ORANTA" there is 1 UAH of the capital accounts for 1.95 UAH of net insurance premiums, but it should be emphasized that this is evidence of active insurance activity. PAT "PZU Ukraina" and PAT SK "UNIKA" take on excessive credit risk because in the first insurance company there is 1 UAH of capital accounts for 22.8 UAH net insurance premiums, and for the second one – 21.91 UAH. Accordingly, these values fall within the range from 200 % to 300 %, which corresponds to the marginal financial state.

The reversal solvency indicator characterizes the share of liabilities in the structure of capital. The value of this indicator in three out of five stable companies exceeds 75 %, which is inadequate financial status. For example, in PAT NASK "ORANTA" this indicator is 159.51 %, in the PAT "PZU Ukraina" the value reaches more than 400 %, in PAT SK "UNIKA" the figure is 193.20 %. This indicates that these insurance companies have sub-optimal obligations. Only in PAT SG "TAS" the return on solvency is 12.38 % and falls within the range from 0 % to 20 %, which corresponds to a stable financial state. PAT SK "Providna" as per this indicator has a marginal financial condition since the share of liabilities in this insurance company is 73.60 % of the capital.

The rate of return shows that all investigated stable insurance companies gained profits in the calculation period, because the indicated indicator has positive values, in particular, in PAT NASK "ORANTA" (14,79 %), PAT SK

"Providna" (10,23 %), PAT "PZU Ukraine" (26.32 %), PAT SK "UNIKA" (21.68 %). The highest yield is observed in PAT SG "TAS" – 40.01 %, which corresponds to a satisfactory financial condition.

The Indicator of insurance coverage for PAT NASK "ORANTA" and PAT SK "UNIKA" corresponds to a gap of less than 50 %, indicating a stable financial status for this indicator. The other three insurance companies fall under this indicator in the range from 50 % to 100 % (satisfactory financial condition). For example, in PAT SK "Providna" for 1 UAH of net earned prizes is UAH 0.05 of costs and benefits. The smallest value of the indicator is noticed in PAT NASK "ORANTA" - 32.79%.

According to the Indicator of capital changes, all five stable insurers have a stable financial position. For example, the highest value is PAT SK "UNIKA" – 131.22 %. This means that in 2016, the capital of this insurance company is 131.22 % higher than in 2015.

According to the change in the Indicator of changes in the number of net bonuses for all policies, the four investigated stable insurance companies have a marginal financial position since the indicator values fall between 10 % and 33 %. The smallest indicator in PAT SK "UNIKA" is 9.86 % (unsatisfactory financial condition). Thus, in 2016, the net premium for all policies of this insurance company is 9.86 % higher than in 2015.

The indicator of independence from reinsurance is calculated as the ratio between the number of net premiums for all insurance policies and the sum of gross premiums. According to this indicator, three insurance companies (PAT NASK "ORANTA", PAT SK "Providna" and PAT SG "TAS") have an unsatisfactory financial condition, because the value exceeds 85 %. The value of the indicator in PAT "PZU Ukraina" is 46.31 %, which corresponds to a satisfactory

financial state. The best indicator of all investigated insurers belongs to PAT SK "UNIKA": 80.95 % of gross premiums of this company consist of net insurance premiums, which corresponds to a stable financial condition.

PAT NASK "ORANTA", PAT "PZU Ukraina" and PAT SK "UNIKA" have an unsatisfactory financial position in terms of the indicator of the ratio of net insurance reserves to capital. Their values (121.71 %, 128.62 %, and 101.25 %, respectively) are indicating the excess of net reserves over the volume of capital. In PAT SG "TAS", this indicator is 96.24 %, which allows the financial status of this insurer to be classified as "marginal". The best value belongs to PAT SK "Providna" – 61.91 % of the capital is net insurance reserves, which allows categorizing the financial position of the company as "satisfactory".

Since PAT SK "Providna" did not invest in the calculation period, the index of return on investment in this insurer is 0 %, which allows describing their financial status as "marginal". PAT SG "TAS" has a high value of return on investment – 57.76 %, which allows attributing its financial position and the condition of other three companies with the values of 10.68 %, 19.06 % and 12.35 % to the stable.

Table 4.4. The value of indicators of the early warning test for liquidated insurance companies of Ukraine by 2016, calculated by the author based on data [48, 43, 42, 49, 50]

Indicator	Liquidated insurance companies				
	PrAT SK Dim Strakhuvannia	PAT Kyivskyi Strakhovyi Dim	PAT Yevropeiskyi Strakhovyi Soiuz	PrAT SK SalamandraUkraina	PrAT SK PLANETA STRAKHUVANNYA
1.Indicator of receivables	91.08	62.51	13.45	84.83	2.47
2.Asset liquidity index	26.01	58.08	61.47	88.36	0.22

continued table 4.4

3.Indicator of insurance risk	33.30	190.17	89.67	41.78	6.20
4.Reversal solvency indicator	21.39	160.98	60.25	39.78	85.59
5.Rate of return	0.02	-6.32	-4.49	0.19	-3.34
6.Indicator of insurance coverage	56.26	48.71	57.96	63.69	95.05
7.Indicator of capital changes	-50.58	15.67	8.49	-21.40	-94.01
8.Indicator of changes in the number of net bonuses for all policies	-25,95	17,26	11,96	5,37	-13.19
9.Indicator of independence from reinsurance	71.79	69.97	99.58	43.20	100.00
10.Indicator of the ratio of net insurance reserves to capital	9.76	73.92	42.52	15.90	83.77
11.Return on investment	0.17	11.83	8.13	6.91	0.00

Analyzing the data in Table 4.4, we can conclude that, according to the indicator of receivables from five liquidated insurance companies: two (PAT "Yevropeiskyi Strakhovyi Soiuz" and PrAT SK "PLANETA STRAKHUVANNYA") correspond to a stable financial state; one (PAT "Kyivskyi Strakhovyi Dim") – satisfactory; two (PrAT "SK" Dim Strakhuvannia "and PrAT "SK" Salamandra-Ukraine") – the marginal. For example, for PrAT SK "PLANETA STRAKHUVANNYA" it is UAH 1 capital accounts for only UAH 0.02. Receivables, at PrAT "SK "Dim Strakhuvannia" are UAH 0.91.

PrAT "SK" Salamandra-Ukraina" has a high liquidity ratio of 88.36 ≥ 60 %. On the one hand, it is a positive fact, but on the other hand, if the reason for this is an excess of assets, then there is a problem to optimize their use. All four other insurance companies fall below this figure of less than 65 %, which corresponds to an unsatisfactory financial situation. The smallest value of the indicator belongs to PrAT SK "PLANETA STRAKHUVANNYA" and equals to only 0.22.

The value of the indicator of insurance risk for four liquidated insurance companies is within the range that corresponds to a stable financial position. Thus, in the PrAT "SK" Dim Strakhuvannia, the index is 33.30 %, in the PAT "Yevropeiskyi Strakhovyi Soiuz" – 89.67 %, PrAT "SK" Salamandra-Ukraine" – 41.78 %, PrAT SK "PLANETA STRAKHUVANNYA" – 6.20 %. However, a rather low level of the indicator in the last company can show that the insurance activity is rather low, which in general is a negative factor for the financial state.

Analyzing the value of the reversal solvency indicator, it can be noted that in PAT "Kyivskyi Strakhovyi Dim", the total amount of obligations significantly exceeds the amount of capital, which is a negative factor for the financial condition because the obligations of this insurer are 160.98 % of its capital. The smallest value of the indicator is observed in PrAT "SK" Dim Strakhuvannia" – 21.39 %, which corresponds to a satisfactory financial condition.

After analyzing the rate of return, it can be concluded that three of the five liquidated insurance companies received losses in 2016 (PAT "Kyivskyi Strakhovyi Dim", PAT "Yevropeiskyi Strakhovyi Soiuz", PrAT SK "PLANETA STRAKHUVANNYA"), and only two insurance companies received profits (PrAT "SK" Dim Strakhuvannia "and PrAT" SK "Salamandra-Ukraine"). Moreover, it should be noted that the profitability of the last two profitable companies is quite

low – 0.02 % and 0.19 %, respectively, which corresponds to the marginal financial status.

The value of the insurance coverage indicator shows one stable financial insurance company because the value of the indicator in PAT "Kyivskyi Strakhovyi Dim" is 48.71 %. In the other four insurers, the financial position as per this indicator is characterized as satisfactory. However, it should be noted that in PrAT SK "PLANETA STRAKHUVANNYA" the value of the indicator is rather high (95.05 %), which indicates that for 1 UAH of net earned prizes accounted for 0,95 UAH of payments and expenses, which is not a positive factor for the financial condition.

Analyzing the indicator of changes in capital, it should be noted that the three companies reduced the amount of capital in 2016 compared to 2015. Thus, for PrAT "SK" Dim Strakhuvannia, PrAT "SK "Salamandra-Ukraina" and PrAT SK "PLANETA STRAKHUVANNYA" values are negative. The lowest value is observed in the last insurer: its capital declined by 94.01 % over the indicated period. The financial status of PAT "Kyivskyi Strakhovyi Dim" for this indicator is characterized as stable since the value fell in the range of more than 10 %.

By the indicator of changes in the number of net bonuses for all policies, the three surveyed liquidated insurers have an unsatisfactory financial condition. The decrease in net premiums in 2016 compared to 2015 is observed in PrAT "SK "Dim Strakhuvannia" and PrAT SK "PLANETA STRAKHUVANNYA". Other insurance companies experienced a slight increase in net premiums over the period under review, such as PrAT "SK" Salamandra-Ukraina volumes, which increased by 5.37 %. The highest value is 17.26 % in PAT "Kyivskyi Strakhovyi Dim".

According to the indicator of independence from reinsurance, two insurance companies (PrAT "SK "Dim

Strakhuvannia" and PAT "Kyivskyi Strakhovyi Dim") fall in the range from 50 % to 85 %, which corresponds to stable insurance status. The indicator for the other two insurers exceeds 85 %, which means that PAT "Yevropeiskyi Strakhovyi Soiuz" and PrAT SK "PLANETA STRAKHUVANNYA" have an unsatisfactory financial condition. The indicator in PrAT "SK "Salamandra-Ukraina" reaches 43.20 %, which allows attributing the financial status of the insurer to the category "satisfactory".

The values of the ratio of net insurance reserves to the capital of PrAT "SK "Dim Strakhuvannia" (9.76 %), PAT "Yevropeiskyi Strakhovyi Soiuz" (42,52 %) and PrAT "SK "Salamandra-Ukraina" (15,90 %) allow considering the financial status of these insurers as "stable". The satisfactory financial status of this indicator is PAT "Kyivskyi Strakhovyi Dim" (73.92 %), it is worth paying attention to a fairly high share of net insurance reserves in relation to capital. PrAT SK "PLANETA STRAKHUVANNYA" has the marginal financial position for this indicator. The ratio of net insurance reserves to the capital of this insurance company is 83.77 %.

One insurance company did not invest in the calculation period, so the PrAT SK "PLANETA STRAKHUVANNYA" return on investment is 0%, which makes it possible to characterize their financial position as the marginal. Also, the low value of the indicator is observed in PrAT "SK" Dim Strakhuvannia " – only 0.17% (marginal financial status). The highest value of the return on investment is in PAT "Kyivskyi Strakhovyi Dim" - 11.83% (stable financial position).

The value of the integral indicator for liquidated and stable insurance companies is shown in Table 4.5.

Table 4.5. The value of the overall assessment of the early warning test for selected Ukrainian insurance companies by 2016

The name of the insurance company	PAT NASK ORANTA	PAT SK Providna	PAT SG TAS	PAT PZU Ukraina	PAT SK UNIKA
The overall assessment of stable insurance companies	3	3	2	3	3
The name of the insurance company	PrAT SK Dim Strakhuvannia	PAT Kyivskyi Strakhovyi Dim	PAT Yevropeiskyi Strakhovyi Soiuz"	PrAT SK Salamandra-Ukraina	PrAT SK PLANETA STRAKHUVANNYA
Overall assessment of liquidated insurance companies	2	2	3	2	3

* Calculated by the author

Analyzing the data in Table 4.5, we can conclude that among the five stable insurance companies, the financial status of four can be attributed to the marginal, because, in the total, we get that PAT NASK "ORANTA", PAT SK "Providna", PAT "PZU Ukraine" and PAT SK "UNIKA" receive 3 points. This means that there is a concern in the financial condition of these insurance companies as of 2016 and their financial indicators are at level, which is significantly below the average. PAT SG "TAS" received 2 points and its financial condition can be characterized as satisfactory, which mean that the insurer does not have serious problems and its financial indicators are on an average level.

Among the five liquidated insurance companies in 2017, two received a general rating of 3 (PAT "Yevropeiskyi Strakhovyi Soiuz" and PrAT SK "PLANETA

STRAKHUVANNYA"), which means that their financial position can be characterized as the marginal. The financial status of the indicated insurance companies as of 2016 causes concern and their financial performance is at a level, which is below the average. Three other insurance companies (PrAT "SK" Dim Strakhuvannia", PJSC" Kyivskyi Strakhovyi Dim "and PrAT" SK "Salamandra-Ukraina) received rounding off 2 points. Their financial position can be characterized as satisfactory, and the mentioned insurers do not have serious problems and financial performance is at the average level according to the test result.

In the conclusion, we can say that one year before the elimination of early warning tests, the financial condition of the three companies liquidated in 2017 was characterized as satisfactory, which contradicts the logic of future events. Also, in the analysis, we found contradictions in the interpretation of some indicators. Despite the fact that the value of the calculated indicator could indicate a negative trend in the activities of the insurance company, it still fell into a gap that corresponded either to a stable state, or satisfactory. We consider it necessary to either improve the rating scale or develop a new methodology for assessing the financial condition and preventing insolvency of the insurer.

5. THE ROLE OF FINANCIAL SUPERVISORY BODIES AND THEIR INDEPENDENCE IN INCREASING THE FINANCIAL SECTOR STABILITY

5.1. Regulatory measures of financial supervisors in the context of ensuring the financial sector stability

Before considering the aspects of financial services markets regulation, it should be noted that the Law of Ukraine "On Financial Services and State Regulation of Financial Services Markets" defines the term state regulation of financial services markets as an implementation by the state of the complex of measures for the financial services markets regulation and supervision in order to protect the interests of financial services consumers and prevent crisis phenomena. That is, the key elements to ensure the functioning of the whole mechanism of state regulation of financial services markets [35].

In order to ensure timely detection and minimization of risks which threaten the stability and stability of the state's banking and financial systems, the Council for Financial Stability was created. It includes the heads of the National Bank of Ukraine, Ministry of Finance of Ukraine, National Securities and Stock Market Commission, National Commission for State Regulation of Financial Services Markets and Individual Deposit Guarantee Fund. The Council is responsible for systemic risks detection and monitoring, development of recommendations for systemic risks leveling, coordination of quick response measures and communication system in conditions of instability [31].

The Council reports on results of its activity annually. For example, the 2018 annual report contains the information on the updated Council composition, the review of systemic risks, the analysis of the state banks activity, the prospects of cryptocurrencies in Ukraine, the fiscal and monetary policies

coordination issues, the analysis of the Individual Deposit Guarantee Fund capacity, the plans for reforming the infrastructure of capital and commodity markets, the main aspects of cooperation with international donors.

The National Bank of Ukraine plays a great role in ensuring the financial stability of the banking and financial systems. It is in charge of macroprudential analysis executing; stress-testing conducting; macro-prudential policy tools development and implementation; participation in the preparation of legislation; the fulfillment of the role of the lender of last resort; controlling the individual banks financial stability; supervising the payment systems and settlement systems; the cooperation with state authorities which contribute to ensuring financial stability [76].

Every half a year the NBU publishes the results of the financial system and economy risks analysis in the Financial Stability Report. Its goal is to identify the risks of financial stability in Ukraine, analyze their impact on the financial system and the country economy and provide recommendations for enhancing financial stability. For instance, the December 2018 report provides information on the financial stress index, trends and risks of the external and internal environment, contains a map of the banking environment risks and the risk of consumer lending, recommendations for state authorities on ensuring financial stability as well as additional thematic materials on stress-testing of banks and security of cashless settlements [38].

Considering the issues related to the state regulatory measures to ensure the banking sector stability in more detail, it is important to note that the term "banking regulation" is determined by the legislation. According to the Law of Ukraine "On Banks and Banking activity" (Article 1): "banking regulation is one of the functions of the National Bank of Ukraine which is to develop a system of norms aimed to

regulate banking activity, define the general principles of banking activity, the procedure for carrying out banking supervision, liability for violation of banking legislation" [32]. We can conclude from the definition that in order to ensure the fulfillment of the banking regulation function the NBU, first of all, carries out the rule-making activity. The National Bank issues regulatory acts on issues assigned to its authority. These acts are obligatory for state authorities and local self-government bodies, banks, enterprises, organizations, and institutions as well as individuals. The established norms are tools for regulating, supervising and controlling the banking activity.

For example, within the framework of ensuring Ukraine's banking sector stability, the NBU has introduced the annual assessment of the banks' stability since January 1, 2018. For this purpose, the NBU has approved the Regulations "On the implementation of assessment of the stability of banks and bank system of Ukraine" on December 22, 2017 [66]. This assessment involves 3 stages, namely auditing the quality of banks' assets and the level of credit operations provision, extrapolation of the obtained results and the assessment of the bank's capital adequacy using stress testing method by the NBU. It is also assumed that in case of detecting a lack of capital, the banks will have to develop a plan to restore the capital level to the minimum needed one to level future risks. In turn, these measures should promote the banking system stability which includes financial stability.

The results of banks stability assessment in terms of banking institutions were first made public on December 29, 2018. The stability assessment includes assessment of assets quality and stress testing. The results of the stability assessment indicate that the banking sector is sufficiently capitalized. But at the same time, the banking sector should increase the margin of safety in order to strengthen resistance to possible crises [67].

Besides, the statistics of indicators of deposit corporations" financial stability regarding capital adequacy, assets quality, profits and profitability, liquidity, market risk sensitivity and recommended indicators are published on the official website of the National Bank of Ukraine. The results are further used in the macroprudential analysis. It contains the evaluation and control over the strengths and vulnerable spots of financial systems in order to increase financial stability, in particular, to reduce the likelihood of the financial system collapse [78]. It is assumed that publicizing results of banks stability assessment will increase the level of investor, depositor and client awareness towards banking system state. This, in turn, will have a positive impact on the level of confidence in the bank and will contribute to the fulfillment of one of the National Bank strategic goals, namely ensuring a stable, transparent and efficient banking system.

In addition to the financial stability indicators, the NBU has established 11 obligatory economic norms aimed to protect the depositor and creditor interests and ensure the financial security of banks. These norms are to ensure control of risks associated with capital, liquidity, lending, capital investments and of interest rate and currency risks [28].

It is also worth saying, that the Law of Ukraine "On banks and banking activity" includes a separate section focused on banking regulation and supervision which is an evidence of a close connection of these functions. Article 55 of the mentioned Law defines the security and financial stability of the banking system, the protection of depositor and creditor interests to be the main goal of banking regulation and supervision. The National Bank of Ukraine carries out functions of bank regulation and supervision of the banks and banking groups' activity on an individual and consolidated basis [32]. The supervisory activity of the NBU covers all banks, their separated subdivisions, affiliated and related

entities of banks in Ukraine and abroad, foreign bank institutions in Ukraine, as well as legal and natural entities. The National Bank of Ukraine carries out banking supervision in the form of inspections and off-site supervision.

Banking regulation and supervision fulfills the following task: protecting the interests of clients and depositors who place their funds in banks against ineffective management and fraud; creating a competitive environment in the banking sector; ensuring transparency of the banking sector; increasing the stability and efficiency of banking activity; maintaining the required level of standards and professionalism in the banking sector [19]. The supervision also includes registration and licensing of banking institutions; performing diagnostics of banks (annual stability assessment); executing reorganization, termination, and liquidation of insolvent banking institutions; working with pledges of insolvent banks; promulgation of illegal currency exchange points list.

Supervision over non-bank financial groups on a consolidated basis is performed by the National Commission for State Regulation of Financial Services Markets and the National Securities and Stock Market Commission. The supervision purpose is to ensure the financial system stability and limit the risks faced by a financial institution because of its participation in financial groups. This purpose is achieved due to regulating, monitoring and controlling the risks of the financial group.

These bodies have a right to set requirements for the financial group and its subgroups concerning the following issues: availability of the effective corporate governance, risk management and internal control systems; availability of the accounting procedures and information systems; report preparation and the procedure for their submission; regulatory capital adequacy; economic standards; limits and restrictions for certain activities including activities on the territory of

other states; procedure for the submission of required reporting and information [35].

The state regulation of financial service provision activities is carried out through the following measures: keeping state registers of financial institutions and persons entitled to provide certain financial services; licensing financial service provision activities; normative and legal regulation; supervision of activities of financial services markets participants; application of influence measures by authorized public authorities; conducting other state regulation measures [35].

Prudential supervision plays an important role in ensuring financial stability through state regulation. It is an element of the overall supervisory system and is based on the regular evaluation of the following issues: overall financial standing of the financial institution, the results of system performance and quality of its management, compliance with mandatory standards and other indicators and requirements aimed to limit the financial asset transaction risks.

Within the framework of prudential supervision, the National Commission for State Regulation of Financial Services Markets keeps track of compliance with standards regarding liquidity, capital and solvency, profitability, asset quality and operation riskiness, management system quality and managerial staff, compliance with rules for the provision of financial services.

The Resolution of the Cabinet of Ministers of Ukraine "On approval of criteria for assessing the degree of risk from conducting business activities in the field of financial services markets and determining the frequency of planned state supervision measures" defines the following criteria: the types of services permitted to be provided by business entities on the financial services markets; the period when business entities have got the right to provide services on the financial services markets; indicators of economic entities activity on the

financial services markets; the observance of the legislation requirements in the field of financial services markets by economic entities; the results of audit of business entities reporting. Checking compliance with these criteria is carried out according to the Annual plan for implementation of planned state supervision measures for the relevant year.

At the end of the year, the National Commission for State Regulation of Financial Services Markets publishes the Performance Report. This document contains the information on the state of the non-banking services market, on the provision of administrative services and organizational, personnel and financial support of the National Financial Services Commission. It reflects strategy and reforms, gives results of prudential supervision, inspection activity, financial monitoring and consolidated supervision [35].

5.2. Scientific and methodical approach to assessing the financial supervisor independence in Ukraine

The independence of financial supervisory and regulatory bodies is one of the most important criteria for the formation of the financial sector which is resistant to external and internal crises. In order to verify the level of institutional, operational and financial independence, the evaluation criteria for each regulator have been selected.

The independence of the National Bank of Ukraine, National Commission for State Regulation of Financial Services Markets, National Securities and Stock Market Commission is evaluated using the following criteria [54]:

– tenure term of body manager being on the position;

– tenure term of other top management representatives being on the position;

– conditions of executives assignment to the position;

– conditions of executives dismissal;

– procedure for the executive assigning;
– procedure for the executive dismissal;
– procedure for top management assigning;
– procedure for top management dismissal;
– reinstatement of the executives to the office;
– membership of the executives in political parties.

Operational independence of NBU, National Commission for State Regulation of Financial Services Markets, National Securities and Stock Market Commission is evaluated using the following criteria:

– implementation of norms, rules, and requirements for financial intermediaries activity;

– powers to change the organizational structure and executives and to initiate bankruptcy of financial intermediaries;

– procedure for the abolition of supervisory body decisions;

– avoiding conflicts of interest;
– protection of confidential and official information;
– international and research collaboration;
– public impact on the supervisory body decisions.

Financial independence of NBU, National Commission for State Regulation of Financial Services Markets and National Securities and Stock Market Commission is evaluated using the following criteria:

– formation of the internal organizational structure;
– budget formation;
– budget structure;
– financial control procedure.

Each criterion is appropriately assigned a rating score: E – perfectly, G – good, S – satisfactorily, U – unsatisfactorily. It gives an opportunity to calculate diffuse indices by the following formulas [54]:

$$I_{П} = \frac{i_E + 0{,}5\, i_G - 0{,}5\, i_S - i_U}{i_E + i_G + i_S + i_U}, \quad (5.1)$$

where

$I_{П}$ – diffuse index of supervisory body institutional independence;

i_E, i_G, i_S, i_U – criteria of supervisory body institutional independence, which have received appropriate ratings.

$$I_{OI} = \frac{O_E + 0{,}5\, O_G - 0{,}5\, O_S - O_U}{O_E + O_G + O_S + O_U}, \quad (5.2)$$

where

I_{OI} – diffuse index of supervisory body operational independence;

O_E, O_G, O_S, O_U – criteria of supervisory body operational independence, which have received appropriate ratings.

$$I_{FI} = \frac{f_E + 0{,}5\, f_G - 0{,}5\, f_S - f_U}{f_E + f_G + f_S + f_U}, \quad (5.3)$$

where

I_{FI} – diffuse index of supervisory body financial independence;

f_E, f_G, f_S, f_U – criteria of supervisory body financial independence, which have received appropriate ratings.

It is worth mentioning that diffuse indices values may be within the following ranges:

– [-1; -0.5) – corresponds to a very low independence level;

– [-0.5; 0) – corresponds to a low independence level;

– [0; 0.5) – corresponds to a medium independence level;

– [0.5; 1] – corresponds to a high independence level.

The calculation results of diffuse indices of institutional, operational and financial independence of the NBU, National Commission for State Regulation of Financial Services Markets and National Securities and Stock Market Commission as of 2017 are represented in Table 5.1.

Table 5.1. Diffuse indices of institutional, operational and financial independence of the NBU, National Commission for State Regulation of Financial Services Markets and National Securities and Stock Market Commission as of 2017

The name of the body	Institutional independence	Operational independence	Financial independence
National Bank of Ukraine	1.00	0.88	0.50
National Commission for State Regulation of Financial Services Markets	0.15	0.86	-0.63
National Securities and Stock Market Commission	0.15	0.86	-0.63

According to the data in Table 5.1, we can conclude that the NBU has the highest independence level. The values of all its indices are within [0.5; 1] range which corresponds to a high independence level.

Within the framework of financial independence analysis, it is important to mention that the NBU forms the organizational structure independently; forms the budget, which is approved by the supervisory authority, independently; budget structure includes spending on personnel development, business trips, and technical equipment; financial control procedure is executed independently with the legislative body.

– The National Commission for State Regulation of Financial Services Markets and National Securities and Stock Market Commission have equal independence levels according to our calculations. In both cases, institutional independence index equals 0.15 which corresponds to the average level. Operational independence is on a high level because an appropriate index equals to 0.86 and falls into [0.5; 1] range. Financial independence is on the worst level because the index has negative value and reaches -0.63 rating. It within [-1; -0.5) range which corresponds to a very low independence level.

Thus, the National Commission for State Regulation of Financial Services Markets and National Securities and Stock Market Commission determine the internal organizational structure on their own and agree on it with the executive body; their budget is formed during the budget process; budget structure includes spending on personnel development, business trips or technical equipment; financial control procedure is executed independently with the legislative body.

In order to increase the financial supervision independence level in Ukraine, it is important to create all the necessary conditions to avoid political pressure, expand the requirements for the appointment of managers, improve the requirements for avoiding conflicts of interest and protecting the confidential and official information, provide the financial supervision functions financing by financial intermediaries and improve the cost structure of supervisory bodies.

CONCLUSIONS

Financial security is an integral part of economic security and a guarantee of national security of the state. It is expressed as an integral state of financial flows within the financial, monetary, currency, banking, fiscal, accounting, investment and stock systems of the country. These flows should be characterized by equilibrium, resistance to endogenous and exogenous shocks, to ensure the stability of the financial sector and overall economic growth.

Effectiveness of financial security measures, instruments and tools requires the elaboration of a financial security management system with effective information and communication processes based on the analysis, use, monitoring and forecasting of information from financial markets, which are the barometers of the state of the economy and its financial security.

The essence and peculiarities of the process of the state's financial security management were determined, the scientific-methodical approach to assessing the level of financial security of Ukraine, the principles of coordination of the systems of management of financial sector stability and financial security with the use of information from financial markets was developed. The basis for this was the basic concepts that explain the formation and dissemination of information, its asymmetry in the financial markets.

For the first time complex systematization of the main theoretical concepts of financial markets modeling and forecasting, in particular the Efficiency Market Hypothesis, the Fractal Market Hypothesis, the hypothesis of adaptive markets, the theory of behavioral finance, the noise hypothesis of the market, etc., was carried out. By using a single scheme of research of existing concepts, the obtained results enable us to determine the key differences between the data of theories and

to find out the conditions for using one concept or another, the advantages and disadvantages, as well as the basic assumptions on which the theory is based.

Unlike existing works, the feasibility of implementing information-analytical support for the state's financial security system from different segments of financial markets (foreign exchange, stock, derivatives, etc.) was theoretically substantiated. In addition, there was further development of existing work in terms of deepening the essence and mechanisms for the application of information from financial markets to reduce the level of information asymmetry, volatility, probability of occurrence of crisis phenomena. The study of modern trends in the neutralization of information asymmetry in financial markets as a basis for increasing financial security of the state was carried out on the example of the market of responsible investment.

The scientific and methodological principles of neutralization of information asymmetry in economics, based on the systematization and grouping of methods of its reduction, are determined in the framework of each group of a specific set of tools, among which the results of forecasting prices for financial instruments, their volatility, with the subsequent use of the results for the development of approaches to ensuring the stability of the financial sector.

The study formalizes the determinants, principles and mechanisms for the transfer of financial sector stability to the level of financial security of the state based on information from financial markets. At the moment, the key tools of macroprudential analysis and their role in ensuring financial sustainability, which is integrated into a discriminant model of financial stability analysis, are outlined.

The revealed features of financial supervision in Ukraine allowed establishing the role of the state in the process of ensuring the stability of the financial sector. The rationale for

the role of the state in the implementation of financial supervision as the basis for the financial sector stability is complemented by the periodization of its development, which provides the opportunity to examine the specifics of the financial supervision in Ukraine in an evolutionary context. The author's approach to determining the level of independence of supervision over financial markets serves as a formal basis for increasing the level of institutional, financial and operational independence of financial supervisors as a guarantee of improving its quality.

The obtained results complement the tools necessary to increase the stability of the financial sector of Ukraine and its financial security and provide the necessary information on the appropriateness of adopting changes in the state regulatory policy in order to adapt its financial security to changeable conditions of financial sector functioning.

All these results in complex create the theoretical and methodological basis for solving the problems of information and analytical support of the state's financial security management using information from financial markets.

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