



Improving the methodical approach to evaluation of economic security of banking institutions of Ukraine

Zlepšenie metodického prístupu na hodnotenie ekonomickej bezpečnosti bankových inštitúcií Ukrajiny

Sergey LAPTIEV¹, Iryna MIHUS², Yana KOVAL³

¹«KROK» University, Kyiv, Ukraine

²Department of Financial and Economic Security Management, «KROK» University,
Kyiv, Ukraine

³Department of Financial and Economic Security Management, «KROK» University,
Kyiv, Ukraine

The manuscript was received on 25. 11. 2018 and was accepted after revision for publication on
14. 12. 2018

Abstract:

The article is devoted to the development of a crisis risk management strategy for banks, the formation of a mechanism for preventing crisis phenomena in the banking sector. The necessity of early identification of potential problems and determination of the degree of susceptibility of the bank to them is shown. An important element of such a mechanism should be preparatory work, including high-quality planning of crisis management procedures, improving the content of banking supervision, strengthening market discipline and transparency of Ukrainian banks. The article focuses on stress testing issues for risk assessment and management.

Keywords: bank, crisis, management, stress testing.

Abstrakt:

Článok je venovaný rozvoju stratégie krízového riadenia rizík pre banky, vytvorenie mechanizmu na predchádzanie krízovým javom v bankovom sektore. Autori článku zvažujú potrebu včas identifikovať potenciálne problémy a určiť stupeň náchylnosti banky k nim. Dôležitým prvkom takého mechanizmu by mali byť prípravné práce vrátane kvalitatívneho plánovania postupov krízového riadenia, posilňovania obsahu bankového dohľadu, posilňovania trhovej disciplíny a



Improving the methodical approach to evaluation of economic security of banking institutions of Ukraine

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

transparentnosti ukrajinských bánk. Článek sa zaoberá otázkami stresového testovania pri hodnotení a riadení rizík.

Kľúčové slová: banka, kríza, riadenie, stresové testovanie.

INTRODUCTION. FORMULATION OF THE PROBLEM

In today's conditions, the formation of a mechanism for the prevention of crisis phenomena in the banking sector and in each individual bank requires reorientation of the work of the National Bank and the management of banks for the early detection of potential problems and the degree of predisposition to them from one bank or another. This involves the development and implementation of new approaches to assessing the activity quality of banks, the development of trust and cooperation between banking institutions and regulators.

An important element of such mechanism should be the preparatory work, which includes a quality planning of crisis management procedures, improvement of the content of banking supervision, strengthening of market discipline and transparency of the activities of Ukrainian banks.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Fundamentals of economic security regulation at the macro and micro levels are laid by such modern scientists as: Z. Varnaliy [1], B. Hubs'kyi [2], Z. Zhyvko [3], K. Karpova [4], O. Prysyzhnyuk [5] and others.

In our opinion, today among domestic researchers there is no single point of view regarding to the system and indicators that allow to fully characterize the state of the banking system and conduct stress testing and calculate the indicator of economic security assessment of Ukrainian banking institutions.

UNSOLVED EARLIER PART OF THE GENERAL PROBLEM

Today, the method of conducting stress testing is not yet fully disclosed, which reflects the fact that in Ukraine today there are many obstacles to the effective development of the system of stress testing of banks.

First, this is the lack of a detailed methodology and algorithm for stress testing in banks. It is assumed that each bank must independently develop its own stress-testing procedure and implement its models to analyze the impact of various factors on financial stability, taking into account the individuality of the bank's portfolio and the specifics of its activities. Secondly, the level of financial expenditures for the implementation of the stress testing system (the purchase of appropriate software, personnel training, etc.) is too high. Thirdly, the lack of experience in conducting stress testing causes significant errors in conclusions, forecasts and assumptions. Fourth, the asymmetry of information causes distorted conclusions and results of stress testing, which can lead to the introduction of the system simply to the mandatory reporting form.

FORMULATING OF GOALS OF THE ARTICLE

The goal of the article is to carry out an analysis of the modern methodology for assessing the economic security of Ukrainian banking institutions and provide their own proposals for their improvement.

Improving the methodical approach to evaluation of economic security of banking institutions of Ukraine

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

PRESENTATION OF THE MAIN RESEARCH MATERIAL

The negative changes that have taken place in the banking system of Ukraine have reduced the overall level of its economic security and have led to the need to improve the methodology of conducting stress testing, which will allow to see the timeliness and quality of implementation by the banking institutions of the regulatory requirements of the National Bank of Ukraine to their activities. To predict the probability of a crisis situation in a banking institution, it is proposed to conduct stress testing, as at a specific time (each quarter, half a year, year), and consider the results obtained over the past five years, which will allow you to follow the dynamics of the requirements and identify the crisis in the early stages.

Stress testing («stress testing») is a method of quantitative risk assessment, which consists in determining the value of an uncoordinated position that affects the bank on risk and in determining the shock value of the change in the external factor - the exchange rate, percentage rate, etc. A combination of these variables gives an idea of the amount of losses or revenues that a bank will receive if events are developed based on assumptions [6].

In addition, it should be noted that stress testing and bank capitalization according to its results are one of the conditions for cooperation with the International Monetary Fund (Table 1).

Thus, the diagnostic survey of the bank is carried out by conducting by the National Bank of Ukraine an audit of asset quality assessment, capital adequacy and stress testing.

The object of the diagnostic examination of the bank in the first stage is the accounting data, statistical reporting and other data of the bank as of the date of the diagnostic examination.

The bank submits other reports to the National Bank, in particular internal and external auditors, materials of the last diagnostic examination and the latest inspection. Particular attention should be paid to issues of credit assessment, percentage recognition, collateral valuation and definition of bank related persons. The remarks made in these reports should be taken into account when creating a sample of loans and assessing their quality.

Tab. 1 Conduct stress testing by banking institutions in Ukraine

	Stress testing 2014	Stress testing 2015-2016	Regular assessment of stability from 2018
Performers	9 audit companies	NBU	Audit companies and NBU
Bank selection	34 banks (79% of assets)	60 banks (97% of assets)	25 banks (94% of assets)
Macroeconomic scenarios	Base Unfavorable	Base	Base Unfavorable
Stress testing of big debtors	No	Yes	Yes
Risks	Credit Currency	Credit Currency	Credit Currency Percentage

Source: compiled by the author

Improving the methodical approach to evaluation of economic security of banking institutions of Ukraine

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

For the first stage of the bank's diagnostic examination, the bank is required to provide information to the National Bank as of the date of the diagnostic examination regarding:

- the financial condition of the bank (balance sheet of assets and liabilities of the bank, formed on the outgoing balances of balance accounts, income and expense accounts and off-balance accounts of the Account Plan);

- a list of persons connected with the bank, determined in accordance with Article 52 of the Law on Banks and taking into account the Regulation No. 315;

- the classification of all assets / financial liabilities (by type of assets) and the size of credit risk;

- a list of loans and financial obligations granted to big debtors whose total debt is equal to or exceeds UAH 100,000 thousand, or 5% of the regulatory capital of the bank, as well as to the ultimate owners of the bank and other affiliated persons of the bank, with a specific indication of those, which have been restructured, prolonged or reclassified to higher (better) risk categories over the past two years;

- calculation of the norm of H2 in accordance with requirements;

- a list of fixed assets of the bank registered in the temporarily occupied territory of Ukraine and / or territory of the anti-terrorist operation sold after the date of the diagnostic survey, with a separate indication of the buyer's name (in the context of related and unrelated persons), the selling price, an account that received funds from the sale, the amounts and directions of the use of such funds. Treaties on the sale of such fixed assets must be duly executed in order to prevent the definition of such contracts invalid.

During the second stage of the diagnostic examination of the bank it is planned to conduct an assessment of the sufficiency (adequacy) of regulatory capital and fixed capital in the basic macroeconomic scenario (stress testing) for the period until the end of 2018, carried out on the basis of the results of the first stage of the bank's diagnostic examination (taking into account the extrapolation of the results of the quality loans audit) [7].

The object of the diagnostic survey of the bank in the second stage is the accounting data, statistical reporting and other bank data, adjusted to take into account the results of the first stage of the diagnostic examination of the quality of assets (taking into account the extrapolation of the results of the quality assurance of loans). The financial statements of the bank as of the date of the diagnostic examination should not be adjusted according to the results of the diagnostic examination. The report is intended for use exclusively by the bank and the National Bank, which will submit it for consideration to the International Monetary Fund and the World Bank. All results should be treated as strictly confidential information.

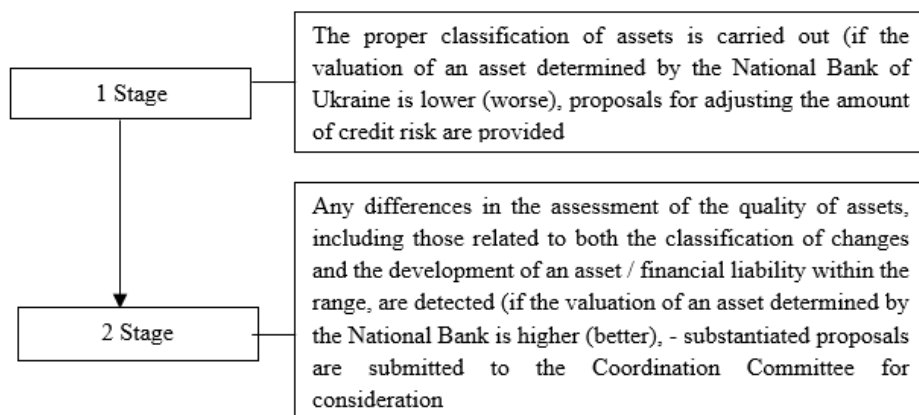
The assessment of asset quality and compliance with the size of credit risk is based on a number of components depicted in Figure 1

On the basis of the performed asset quality assessment, a detailed list of adjustments for different types of assets should be indicated.

We consider it expedient to propose the introduction of functions for conducting stress testing on the department on banking services and coordinating the interaction Department of Financial Policy of the Ministry of Finance of Ukraine with the National Bank of Ukraine as a mega regulator of the financial market.

Improving the methodical approach to evaluation of economic security of banking institutions of Ukraine

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL



*Fig. 1 Components of asset quality assessment and compliance sizes of credit risk
Source: compiled by the author*

The Department of Financial Policy of the Ministry of Finance of Ukraine should be guided in its activities by regulations of the National Bank of Ukraine, Regulations on the Ministry of Finance and decisions of the Board of the National Bank.

The main tasks of the Coordination Committee are:

- coordination of the process of conducting a diagnostic survey of banks;
- monitoring and control of compliance with the requirements of the task during the diagnostic examination;
- approval of the results of the diagnostic examination and preparation of proposals for consideration by the National Bank's management regarding the further activities of the banks.

The Coordinating Committee, in accordance with its main tasks, carries out certain functions: monitoring, consideration of primary documents of the bank, clarification by the bank, coordination of the diagnostic examination process, and the provision of proposals by the Board of the National Bank of Ukraine. To ensure the elaboration of the results of the diagnostic survey of banks and the preparation of relevant proposals for consideration, the working groups are created for consideration by the Coordinating Committee, which includes specialists of the units of the banking supervision service.

Stress testing is carried out using the internal model of the National Bank, agreed with the International Monetary Fund, by assessing the impact of macroeconomic indicators on the indicators of migration of loans between the categories of quality, the size of credit risk, financial position and capital of the bank, in the following order:

- 1) use of bank balance data, compiled taking into account the results of the first stage of the diagnostic examination;
- 2) grouping (distributing) the balance data in the following way:
 - currency of the asset (foreign / national currency);
 - type of asset / liability;
 - asset quality category;
 - type of debtor / counterparty (legal / individuals).
- 3) assessment of the impact on the financial condition of the bank of macroeconomic indicators.

The assessment will be based on the following basic principles:

Improving the methodical approach to evaluation of economic security of banking institutions of Ukraine

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

- large loans will undergo stress-testing individually, taking into account approaches and basic principles;

- on the basis of basic macroeconomic forecasts of indicator calculating.

It is also advisable to assess the condition of servicing the loan taking into account the expected cash flows of the borrower. On the basis of the forecasted values of the borrower it is necessary to allocate to the classes (from 1 to 9) and taking into account the forecast state of service for each loan, it is necessary to assign a new quality category based on the forecasted class of the borrower; the pointwise value of the probability of default within the established ranges for each category of credit quality will be determined taking into account qualitative and quantitative indicators of the borrower.

For positions at risk of government and state / municipal enterprises, the credit quality category will not be reduced for stress testing purposes.

For all other loans and loans granted to individuals, an increase in the amount of arrears in a bank's loan portfolio means an increase in the volume of loans classified in quality categories IV and V. Indicators will reflect changes in the forecast macroeconomic indicators in stress tests and be calculated using the stress test model developed by the National Bank using available data in Ukraine.

The impact of the indicator on a loan portfolio should be determined in proportion to the proportion of loans classified according to the quality categories IV and V in the loan portfolio of the bank, taking into account the results of the first stage of the diagnostic survey. Given the assumption of the immutability of the accounting data, the proportion of loans classified according to the categories I, II and III should be reduced proportionally to their share in the loan portfolio, determined on the basis of the results of the first stage of the diagnostic survey.

The size of credit risk on loans under stress testing should be determined by applying the percentage of credit risk to the appropriate category of credit quality in a separate bank, determined on the basis of the results of the first stage of the diagnostic survey (the corresponding percentage rates of credit risk will be used for agricultural loans and loans to individuals).

If a certain large loan or loan portfolio is transferred to a lower quality level based on the results of stress testing and the actual percentage of credit risk in this category is lower than in the initial category, then the percentage of credit risk for such an individual loan / loan portfolio remains unchanged. For all loans falling into quality categories IV and V (large loans or loan portfolio), the minimum percentage of credit risk at 55% and 70% respectively will be used (separately for loans granted to agricultural activities and loans granted to individuals), if the percentage of credit risk, determined in the first stage, after the assessment of the quality of assets will be lower.

The assessment of sufficiency (adequacy) of regulatory capital and fixed capital by the end of 2018 by the results of the stress-testing will be carried out by determining the amount of sufficiency (adequacy) of regulatory capital and fixed capital for the following actions:

- re-calculation of the amount of credit risk for loans and off-balance sheet liabilities in accordance with requirements;

- preparation of the forecast balance sheet and the statement of financial results of the bank, based on: assumptions about the zero growth of assets (except changes due to the effect of the exchange rate); absence of changes in the structure of assets (except changes due to the effect of the exchange rate); market percentage rates (provided as part of macroeconomic indicators) - taking into account losses from the devaluation of the national currency and reserves;

Improving the methodical approach to evaluation of economic security of banking institutions of Ukraine

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

- calculation of the size of fixed capital;
- calculation of fixed capital;
- calculation of the size of regulatory capital;
- calculation of the norm H2.

It should be noted that national regulatory practice characterized by the lack of public and transparent information on macroeconomic stress testing of the risks of domestic banks.

It is appropriate to give the following data on the results of stress testing of Ukrainian banks, for detailed description of the methodology, it is worth referring to the following table 3.4. As can be seen from Table 3.4, the most significant risk for banks is the credit risk, and the lowest is the percentage rate.

Tab. 2 Assessment of the significance of banking stress testing and banking risks types and approaches, %

Indicators	Stress testing types		
	Portfolio sensitivity test (before changing one factor)	Scenario modeling (several factors change at the same time)	Others (extreme values, maximal losses)
The share of banks for which the type of stress tests is the main	31,3	45,6	23,1
	Types of scenarios		
	Historical	Hypothetical	Other
The share of banks using this type of scenario	40,3	56,7	3,0
	Bank risks types		
	Credit	Market (currency, percentage)	Other (liquidity, operating)
The share of banks for which the type of risk is most significant	76,2	5,6	18,2

Source: compiled by the author

When conducting stress testing banks most often use scenario analysis, which as hypotheses act as triggers of the crisis.

Analyzing the effectiveness of crisis management of a loan portfolio with the help of the considered method, the management of the bank will receive a mechanism for reasonable adoption of managerial decisions with an orientation towards constant changes in the market environment. The proposed methodology for the analysis of efficiency enables a balanced approach to the formation of a loan portfolio, taking into account not only the profitability, but also the real level of risk of credit operations.

**Improving the methodical approach to evaluation of economic security
of banking institutions of Ukraine**

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

Therefore, the most significant of various types of stress testing is modeling the losses of the banking sector as a result of the implementation of credit risks on the basis of constructing hypothetical scenarios (Table 3).

Tab. 3 Loan operations classified according to different banking categories as of 2018, ths. UAH.

Indicator	Group I	Group II	Banks with state share	Banks of foreign bank groups
Credit operations classified by the category I of quality	127815739	21441335	52699919	199456605
Credit operations classified by the category II of quality	88605049	24288223	76571881	132534682
Credit operations classified by the category III of quality	125151236	7307683	30247583	33424229
Credit operations classified by the category IV of quality	12004733	2738637	34734797	39066254
Credit operations classified by the category V of quality	40343335	3928954	93151581	174114032
Loans granted to economic entities by types of economic activity, classified by sections (A, B-E, F)	37236968	12338721	118032456	164234461
Total	431157060	72043553	405438217	742830263

Source: compiled by the author

On the basis of these data, there is an opportunity to analyze credit transactions classified by different categories and we can assert that the credit operations classified by the category I of quality and belonging to the banks of foreign banking groups have the highest indicator - 199456 605 ths.UAH, respectively, credit operations classified in the category IV of quality and belong to the group II have the lowest indicator - 2 738 637 ths. UAH. Thus, we can calculate the size of credit risk by the relevant categories (Table 4).

Tab. 4 The size of credit risk by categories as of 2018, ths. UAH

Indicator	Group I	Group II	Banks with state share	Banks of foreign bank groups
The size of credit risk for Category I	436827	135498	247899	1218812
The size of credit risk for Category II	2298104	842588	4889637	6958098

**Improving the methodical approach to evaluation of economic security
of banking institutions of Ukraine**

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

The size of credit risk for Category III	6102063	1080246	4002794	8838655
The size of credit risk for Category IV	3522772	1295292	10078262	11843581
The size of credit risk for Category V	3183777 1	3089652	84352312	139048792
The size of credit risk by types of economic activity, classified by sections (A, B-E, F)	3723696 8	12338721	118032456	164234461
Total	8143450 5	1878199	22160336	332142399

Source: compiled by the author

The received data confirms the results that were received earlier, and also make it possible to calculate the quality of the loan portfolio and the required amount of credit risk for it (Figure 5).

The assessment of the current financial state and approaches to stress testing should be determined by the bank's structural characteristics, its specialization in the market of banking services and the corresponding risk profile. The urgent need to build effective stress testing models should be to combine the macro and macro levels of projected shifts and to take into account the substitution and concentration effects in all financial flows of banks, and especially in their loan portfolios.

Tab. 5 The structure of the quality of the loan portfolio and the required amount of credit risk as of 2018, ths. UAH

Indicator	Bank data	Data on the results of diagnostic examination taking into account extrapolation	Adjustment +/-
Group I	81434505	81279185	155320
Group II	1878199	1852853	25346
Banks with state share	22160336	21815212	345124
Banks of foreign bank groups	332142399	327817035	4325364

Source: compiled by the author

The comparison of the main forecast indicators with the actual values is given in Table 6.

Tab. 6 Comparison of projected and actual indicators of the National Bank of Ukraine for 2018-2022.

Indicator	2018	2019	2020	2021	2022
Real GDP %	3,1	4,2	5,3	6,1	5,8
Deflator of GDP %	10,1	11,4	10,8	11,3	9,8

**Improving the methodical approach to evaluation of economic security
of banking institutions of Ukraine**

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

Nominal GDP %	14,2	15,4	14,8	15,6	16,1
The interbank rate UAH / USD	27,8	28,5	30,3	31,5	32,8
Consumer price index %	10,3	11,6	12,4	13,1	13,7
Basic consumer price index %	7,4	8,5	9,3	8,7	9,6
Inflation of prices %	10,9	11,3	11,8	10,2	12,2
Credit percentage rate in UAH, %	14,2	14,8	15,7	16,4	17,8
Deposit percentage rate in UAH, %	8,4	9,5	10,4	11,1	11,9
Currency percentage rate, %	9,2	10,1	10,8	11,3	10,7
Deposit currency percentage rate, %	6,3	6,8	7,5	8,1	8,8
The average monthly salary, %	9141	9453	9885	10312	10586
Real salary %	3,5	4,8	5,5	6,7	7,3
Unemployment rate (ILO)	10,2	9,6	8,4	9,5	8,1

Source: compiled by the author

In addition, stress testing significantly expands the ability to assess and manage risk at the state level. The analysis of the results of stress testing helps to identify the risks and weaknesses of the bank and develop appropriate corrective actions. Thus, the management of banks engaged mainly in retail operations, stress tests will assess whether a very sensitive client loan portfolio to changes in the mortgage market and the adverse macroeconomic environment, how much to increase the reserve fund to provide mortgages in a slowdown the growth of the economy and the increase of unemployment level, to what extent the policy of conquering new customers will increase the bank's sensitivity to macroeconomic risks. Answers to such questions are of great importance for developing a strategy and policy for crisis management of bank risks.

Thus, the results of stress testing should be used by the Ministry of Finance of Ukraine when making decisions on the proposals of the National Bank of Ukraine on the introduction of temporary administration or liquidation of banking institutions.

References

- [1] Varnaliy Z. S., Bilyk R. R. Ekonomichna bezpeka ta konkurentnospromozhnist' rehionaiiv: kol. mon. Chernivtsi, 2018. 454 s.
- [2] Hubs'kyy B. V., Ekonomichna bezpeka Ukrayiny: metodolohiya vymiru, stan i stratehiya zabezpechennya: mon. Kyiv, 2001. 121 s.
- [3] Zhyvko Z. B. Metodolohiya upravlinnya ekonomichnoyu bezpekoyu pidpryyemstva : monohrafiya. L'viv, 2013. S. 74.

**Improving the methodical approach to evaluation of economic security
of banking institutions of Ukraine**

Sergey LAPTIEV, Iryna MIHUS, Yana KOVAL

- [4] Karpova K. V., Koval' Ya. S., Mihus I. P. Udoskonalennya metodyky otsynuyvannya kryzovoho stanu bankivs'kykh ustanov Ukrayiny pry derzhavnomu antykryzovomu upravlinni. Investytsiyi: praktyka ta dosvid : nauk. fakh. vyd. 2017. №18. S. 54-60.
- [5] Prisyazhnyuk O. P. Modeli derzhavnoho rehulyuvannya informatsiynoyi ta ekonomichnoyi bezpeky v bankivs'kiy systemi. Informatsiyni tekhnolohiyi ta modelyuvannya v ekonomitsi : Mat. VII nauk.-prakt. konf. (Irpın', 23-24 kvitnya 2009). Irpin', 2009. Kn. 1.S. 418-420.
- [6] Alymov S. O. Osnovni zasady stres-testuvannya v komertsiynomu banku. URL : http://www.nbu.gov.ua/Portal//soc_gum/Suek/2011_6/Alym.pdf (data zvernennya 10.11.2018).
- [7] Y. Koval Stress-testing of complex risks in the banking system, as an instrument of state anti-crisis management. *Public management* : collection. Kyiv : editorial ДП «Видавничий дім «Персонал», 2018. №2. P. 124-135.

Authors:

- ¹ **Sergey Laptiev** - Ph.D. in Economics, Professor, Rector of the «KROK» University, Kyiv, Ukraine. E-mail: laptiev@krok.edu.ua
- ² **Iryna Mihus** - Doctor of Economics, Professor, Vice-Rector of Scientific Work, Professor of the Department of Financial and Economic Security Management, «KROK» University, Kyiv, Ukraine. E-mail: irynamep@krok.edu.ua
- ³ **Yana Koval** - Assistant Professor of the Department of Financial and Economic Security Management, «KROK» University, Kyiv, Ukraine. E-mail: yanaks@krok.edu.ua