STABILITY ANALYSIS OF UKRAINIAN BANKING SYSTEM
АНАЛІЗ СТАБІЛЬНОСТІ БАНКІВСЬКОЇ СИСТЕМИ УКРАЇНИ

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The article deals with the state of the Ukrainian banking system in times of instability and constant changes. During the review period, the penetration of foreign capital increased due to a sharp decline in the number of banks. The sector has seen a significant increase in non-performing loans. There was a substantial excess of expenditure over revenues, which led to loss-making activities. The indicators of capital adequacy, return on assets, return on capital was similarly negative during the first half of the survey. Still, in the last two years, the indicators have improved due to NBU policy. There has been a transparency and capitalization increase in the banking system and the market clean-up from substandard banks. The econometric analysis was performed to study the impact of non-performing loans on the concentration of assets. Based on vector autoregression, we determined the significant effect of non-performing loans on assets.
Key words: *banking system, financial stability, non-performing loans, foreign capital, profitability, capital adequacy.*

В статье рассмотрено состояние банковской системы Украины, исследована динамика основных показателей стабильности системы. Проникновение иностранного капитала увеличилось в связи с резким сокращением числа банковских учреждений. Наблюдался критический рост неработающих кредитов, произошло значительное превышение расходов над доходами, что привело к убыточным операциям. Показатели достаточности капитала и рентабельности активов и рентабельности капитала также были отрицательными в течение первой половины исследования. Тем не менее, за последние два года показатели улучшились, произошло повышение прозрачности банковской системы, очистка рынка от фиктивных и некачественных банков, увеличение капитализации банковской системы и увеличение доходности капитала и активов. Был проведен эконометрический анализ для изучения влияния неработающих кредитов на концентрацию активов в банковском секторе Украины.
Ключевые слова: *банковская система, финансовая устойчивость, неработающие кредиты, иностранный капитал, рентабельность, достаточность капитала.*

Забезпечення фінансової стабільності визначається стійким розвитком банківської системи, яка має вирішальне значення для ефективної грошово-кредитної політики. Успішне функціонування банківської системи - основа ефективного функціонування економіки. Циклічність криз у банківському секторі підтверджує відсутність систем раннього реагування на виникаючі негативні шоки в банківській діяльності і вказує на необхідність посилення контролю та нагляду за всім сектором. Таким чином, першочерговим завданням для країн повинно бути запобігання кризовим явищам банківської системи та зменшення їх негативного впливу на реальну економіку. У статті розглянуто стан банківської системи України у період нестабільності та постійних змін. Протягом досліджуваного періоду проникнення іноземного капіталу збільшилось за рахунок різкого скорочення кількості банківських установ. Незважаючи на зменшення кількості банків, сума активів мала зростаючу тенденцію, що свідчить про те, що на фінансовому ринку України залишаються стабільні банки. У секторі спостерігається значне зростання показника непрацюючих кредитів до небезпечного рівня. Протягом досліджуваного періоду наявне значне перевищення витрат над доходами у банківському секторі України, що призвело до збиткової діяльності. Показники достатності капіталу та рентабельності активів і капіталу аналогічно мали негативні тенденції протягом першої половини дослідження, проте в останні два роки показники покращились і відбулось певне оздоровлення банківської системи. Спостерігалося підвищення прозорості банківської системи, очищення ринку від фіктивних і неякісних банків, підвищення рівня капіталізації банківської системи та зростання показників рентабельності власного капіталу та активів. Для вивчення впливу непрацюючих кредитів на концентрацію активів у банківському секторі України, було проведено економетричний аналіз. На основі векторної авторегресії, ми визначили значний вплив непрацюючих кредитів на активи. Модель була розроблена на основі щомісячної статистики за період з 2017 по 2018 рік.
Ключові слова: *банківська система, фінансова стабільність, непрацюючі кредити, іноземний капітал, рентабельність, достатність капіталу, докапіталізація.*

Introduction. Today, market relations are developing under conditions of fierce competition, which affects not only the industrial sector but also the banking system as a whole. It is known that a developed banking system is a decisive condition for the efficient functioning of the economy. Over the past decade, the situation in the financial market of Ukraine was marked by instability and constant changes, which led to crisis phenomena in the entire economic system, since the financial sector has a direct connection with all sectors of the national economy of Ukraine, as well as with the banking system of other countries. The greatest negative impact was exerted by such factors as liquidation and bankruptcy of banks; unprofitable activities of banks; decrease in the total share of obligations; deterioration in the quality of bank loan portfolios; negative dynamics of the capital of the banking system; hryvnia devaluation; decrease in population income.

The banks of Ukraine are forced to operate under the global uncertainty of the environment, which complicates the process of identification, assessment, and elimination of risks. Therefore, we propose to analyze the functioning of the banking system of Ukraine, to identify the main shortcomings, and consider ways to improve it.

Analysis of recent publications. The issues of ensuring the stability of the banking system are widely researched. Many Ukrainian and foreign scholars have been studying the problems in analysis, evaluation, and ways of ensuring the financial stability of the banking system of Ukraine. There are Barisitz S., Gegenheimer G.A., Karminsky A., Kovalenko V. Kornelyuk R., Kyfak A., Popova Y., Pigul N., Rodionova T., Sochan P., Tsiganyuk D., Shova O. among them. However, the issues of analysis of the latest data on the development of banking systems and the

consideration of the banking system after the financial crisis of 2014–2015 remain out of their attention.

The purpose of this paper is to deepen the study of methods of economic analysis of banking stability in Ukraine and to identify significant gaps in the banking system.

Research results. The National Bank of Ukraine is the central bank, which pursues a unified state policy and plays a regulatory role in the life of commercial banks, which provides support to the banking sector in the event of a falling domestic currency and the resulting panic. To analyze the peculiarities of the banking system of Ukraine, let us consider the dynamics of changes in the number of banks in 2013–2018. In general, during the study period, the number of banks decreased more than twice from 176 banks in 2013 to 77 in 2018. The reason for such a sharp reduction was the unstable economic and political situation in the country, deterioration of bank solvency, quality of bank loan portfolios, and devaluation of the hryvnia (Table 1).

Considering the ownership structure of the assets of the banking system of Ukraine, we note a similar trend with the studied CEE countries: the Czech Republic, Slovakia and Poland. However, if in Poland the amount of foreign capital decreases, the reverse processes occur in Slovakia and the Czech Republic. Thus, the amount of foreign capital in the Czech banking sector amounted to almost 2/3 of the total capital. Although in 2018 domestic capital prevailed in the banking sector of Ukraine, with a large share of state assets throughout the entire period, there is a tendency to increase in percentage measurement of foreign assets (Fig. 1). However, the reason for this is the reduction in the number of banking institutions of domestic owners, and banks with foreign capital do not show significant changes in the number (Table 1). Given the excess of the threshold value of foreign capital of 40%, dangerous conditions are created for the functioning of the banking sector, such as foreign control over the banking system, it is possible to import banking crises from foreign countries, outflow of profits from Ukraine and lobbying for goals contrary to state interests.

As of 2018, the greater share of foreign capital in the banking system of Ukraine belonged to the banks of the Russian Federation – 60.1%. Banks from the countries of the European Union own 37.6% of the authorized capital, in particular, the largest share of 15% belongs to Austria, 4.9% to Luxembourg, 4.2% to France, 4% to Hungary, 3.7% to Greece, 1.7% to Poland and 1.5% to Cyprus. Compared to 2017, in the current period, the share of foreign investment from Austria and Luxembourg has increased, and Cyprus has significantly lost its positions. As for other countries, there was a slight influx of capital from Turkey to Kazakhstan, the United States, Belarus, and the British Virgin Islands. The share of foreign capital from these countries in 2018 amounted to 2.3% of the authorized capital of the banking system of Ukraine (Table 2).

Although during 2013–2018, the number of banks in Ukraine decreased by 2.3 times; the dynamics of assets in the banking sector had a predominantly growing trend. Only during 2015–2016, the period of the most significant reduction in the number of banks, the number of assets decreased from 2014 by UAH 60.5 million to UAH 12.563 billion in 2016. However,

Table 1

Dynamics of change in the number of Ukrainian banks

Indicator	2013	2014	2015	2016	2017	2018
Number of banks licensed by the NB	176	163	117	96	82	77
Number of banks with foreign capital	53	49	41	38	38	37

Source: compiled by the author [1]

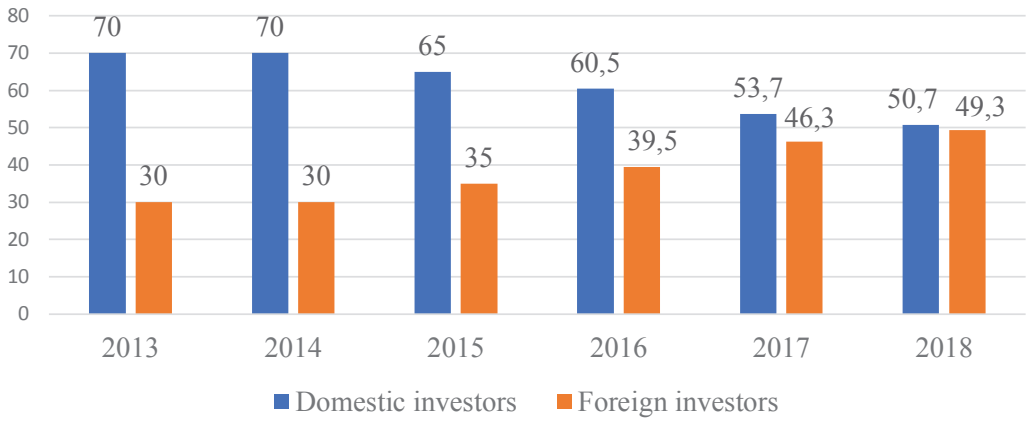

Fig. 1. Changes in the ownership structure of banking system assets 2013-2018, %

Source: compiled by the author [2]

Table 2

VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: ASSETS			
Excluded	Chi-sq	df	Prob.
NPL	6.6820	2	0.0354
All	6.6820	2	0.0354
Dependent variable: NPL			
Excluded	Chi-sq	df	Prob.
ASSETS	13.3767	2	0.0012
All	13.3767	2	0.0012

Source: compiled by the authors

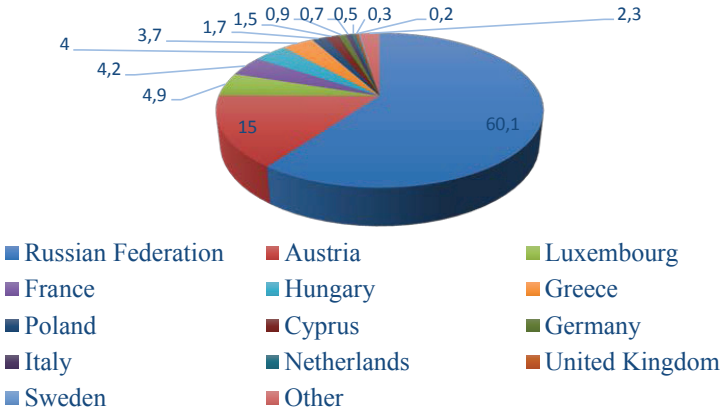

Fig. 2. The presence of foreign capital in 2018, %

Source: compiled by the author [2]

already in 2017-2018 there was a rapid increase in assets, and in 2018, their amount increased by 104.5 billion UAH (Fig. 3).

This tendency indicates that despite the significant decrease in the number of banks during the period under review, stable banks remain in the Ukrainian financial market, multiplying their assets and operating by the law, subject to stringent operating conditions. One of the main factors negatively affecting the fixed assets of banks is the presence of bad debt, that is, non-performing loans. The growth of non-performing loans leads to the need for the formation of vast reserves, a decrease in the efficiency of banking activities and even loss ratio, and also negatively affects the adequacy of banks' equity. Analyzing the dynamics of non-performing loans during 2013–2018, we note that the volume of non-performing loans was constantly growing (Fig. 4). Thus, in 2014 it increased by 31.4%, in 2015 by 51.6%, in 2016 by 9.8%, in 2017 by 31.7%, and in 2018 by 6%. The share of non-performing loans in 2017 reached a critical value of 54.5% of all loans, in 2018, the indicator fell slightly to 52% (table 2.4 Appendix). Throughout the study period, banks' capital was not

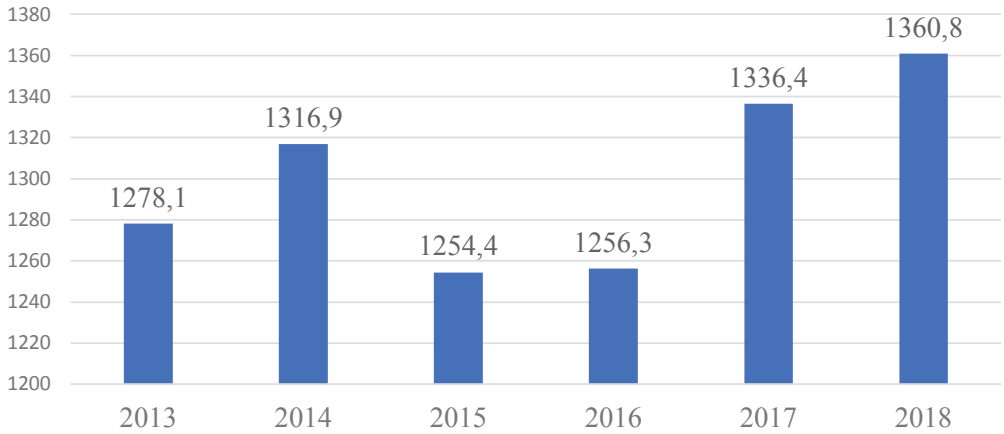

Fig. 3. Amount of assets of the banking sector of Ukraine 2013–2018, billion UAH

Source: compiled by the author [3]

enough to cover the share of non-performing loans. Only because of the additional external capitalization of banks it was possible to ensure the necessary level of equity.

Considering the capital adequacy ratio, in 2013, it had a maximum value of 17.6% for the whole period under review, but during 2014–2016 the value of the indicator decreased by 4.9% to 12.7%. Such a reduction is due to the liquidation of individual banks and the losses resulting from the formation of reserves. During 2017–2018, the position of capital adequacy of Ukrainian banks improved, and at the end of 2018, it stood at 16.2%. Overall, the capital adequacy ratio has been enhanced due to the increase in regulatory capital, which indicates that banks have implemented capital increase programs [2]. Although the capital adequacy ratio during the period under review has been insignificant, it suggests an increase in guarantees for deposit protection and improved financial soundness of banks (Fig. 5).

Characterizing the profitability of banking, we consider such indicators as return on assets (ROA) and return on equity (ROE). The return on equity, for its part, tended to be worse during the period under review. In 2013-2016, the value of the indicator decreased sharply annually, and in 2016 the index reached its maximum low of 116.7%, reducing by 117.5% in 3 years. In 2017, return on equity started to improve, and in 2017 it stood at -15.8%, with a record reduction of 100.9% for the year. In 2018, the figure reached a positive value of 14.4%, improving its position by 30.2%.

The return on assets had a similar trend, so in 2013-2016 its value decreased by 11.8%, reaching a maximum negative value of -12.6% in 2016. During 2016-2018, there was an improvement in the indicator, and in 2018, it was 14.4%, having overcome a negative value, it increased by 27% in 2 years.

In general, during the period under review, there was a significant excess of expenditure over revenues

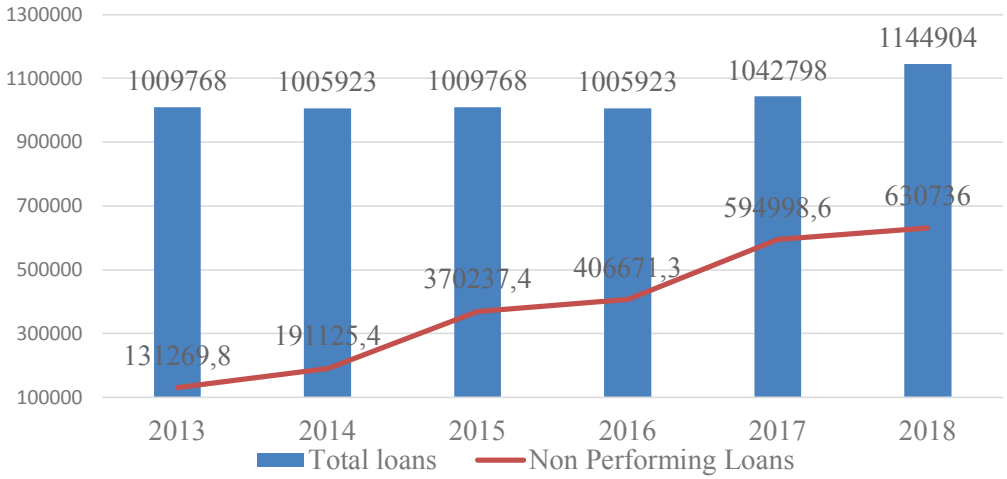

Fig. 4. Dynamics of loans and non-performing loans of the banking sector of Ukraine 2013–2018, million UAH

Source: compiled by the author [2]

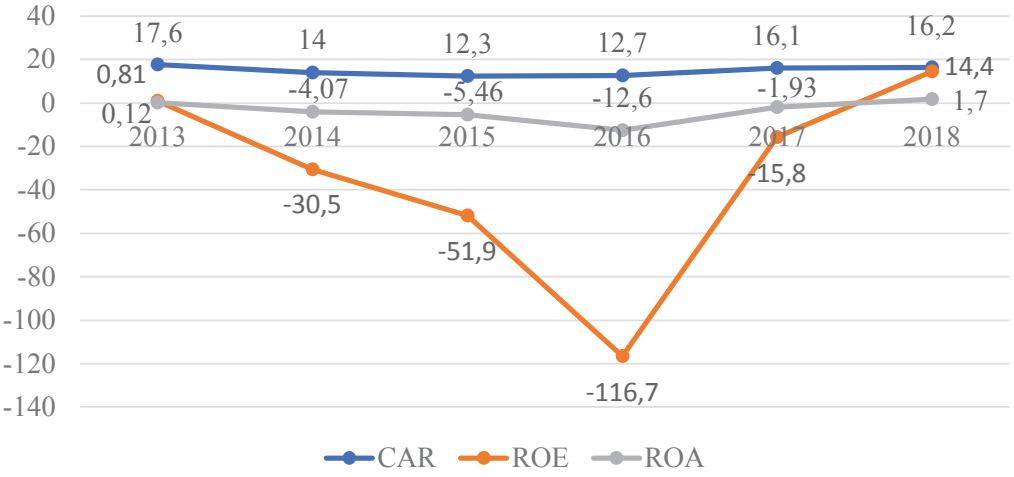

Fig. 5. Dynamics of indicators of capital adequacy, return on assets and equity of the banking sector of Ukraine 2013–2018 (CAR, ROE, ROA), %

Source: compiled according to [4]

in the banking sector of Ukraine, which led to unprofitable activities [5]. This fact has led to the negative values of the indicators of return on assets and return on capital. The situation has been exacerbated by a steady decline in regulatory capital, which in turn has a direct impact on the financial stability and stability of banks, the activities of banks, covering the adverse effects of the risks borne by banks in the conduct of their actions, and ensuring the protection of deposits.

The financial crisis of 2014–2015 hit the banking sector hardest, growing at an accelerating rate. In subsequent years, the quality of credit portfolios of the banking system deteriorated, which led to the need to clean up the banking system and the need to recapitalize banks to create reserves for active operations. Therefore, in 2014–2016, deduction in reserves, deterioration of profitability indicators, reduction of efficiency of use of its capital, and its assets by deposit institutions of Ukraine was one of the main factors of loss of the banking system. Due to the reform of the banking sector, financial rehabilitation programs and the rehabilitation and elimination of "problem" insolvent banks, in 2017–2018, there was an improvement in the return on equity and assets, which in turn indicates the growth of the banking sector and reduction of expenses in general.

The expense-to-income ratio showed some volatility over the period under review. Thus, in 2013–2014 it decreased by 5.1% from 65.6% to 60.5%, further, in 2015 it increased by 13.9% to 74.4%, in 2016–2017. The indicator was kept at 66–67%, and in 2018 it decreased to a comfortable 47.6%, contributing to the stability of the banking system. If the ratio is too high, the bank may not have enough liquidity to cover any unforeseen expenses, and if the ratio is too low, the bank may not earn as much as it could (Fig. 6).

Overall, the indicator showed that Ukrainian banks have become more efficient than several other indicators. This indicator represents an increase in the efficiency of the banking system and is the result of reforms that have benefited everyone.

Analyzing the indicator of the ratio of the bank's loan portfolio to the volume of deposits, we also note some instability of the indicator during the study period. In 2013–2014, the indicator grew by 7.3%, and during the 2014–2017 period, the ratio of loans to deposits decreased by 37.1%; in 2018, the value of the indicator deteriorated again, increasing by 24.8%, up to 139% for the year. Despite the improvement in 2014–2017, it remains at a very high level, exceeding the 100% threshold, which indicates that the volume of loans over deposits is exceeding and concludes that the banking sector of Ukraine has not reached self-financing [6].

Econometric modeling is widely used among the methods of modeling financial stability estimates. After analyzing the financial result of the banking system of Ukraine, we decided to investigate with the help of vector autoregression the impact of non-performing loans on assets. The following data were taken from the National Bank of Ukraine for 2017–2018 years. In total, there are 16 observations in the research. From the data obtained, it can be argued that there is a close mutual causality between assets and the level of non-performing loans since the correlation value is 0,59.

By constructing a vector autoregression and examining the optimal number of lags (2), a Granger test was conducted, which revealed mutual causality between the variables (Table 2). Thus, a strong dependence of assets was found on the level of non-performing loans (coef. = 6,68, p = 3%), similarly present the impact of assets on non-performing loans (coef. = 13,37, p = 0,1%) (Fig. 7).

The regression analysis shows a statistically significant mutual causality between bank assets and the

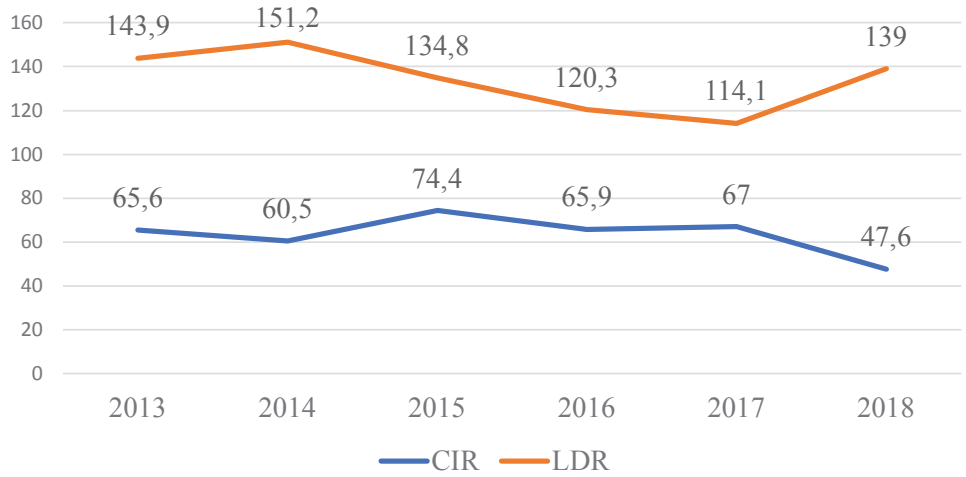

Fig. 6. Dynamics of the ratio of income to expenses and bank loan portfolio to the volume of deposits of Ukraine 2013–2018 (CIR, LDR), %

Source: compiled by the author [2; 3; 4]

level of non-performing loans. The graph of the function of the impulse response of assets to the shock of non-performing loans in one standard deviation and 90% confidence interval is negative and significant in the first 2 periods. The graph of the impulse response function of non-performing loans to an asset shock is positive and significant only in the short term.

Conclusion. Today, the stabilization of the financial and economic situation in the country requires an efficient, reliable, and advanced banking system. The banking sector of Ukraine is experiencing the effects of the deep financial crisis that occurred in 2014–2015, putting the entire industry facing significant challenges.

The massive losses of the banking system, the liquidation, and bankruptcy of more than half of the banks, the decline in all indicators of financial stability led to the need to develop mechanisms for efficient functioning, stable development, as well as to ensure the reliability and security of the Ukrainian banking system.

Each banking institution has a direct impact on the banking system as a whole, so the need to monitor the status of individual banks is significant. Indeed, it is the uncontrolled NBU existence of different banks with an insufficient level of equity, poor quality of assets, inadequate level of bank profitability, and low level of financial stability that have deepened the financial crisis caused by political and economic factors. Therefore, during the post-crisis reform of the financial system, it remains necessary to create a stable banking system in Ukraine that will be able to absorb any crisis phenomena and effectively accomplish its tasks.

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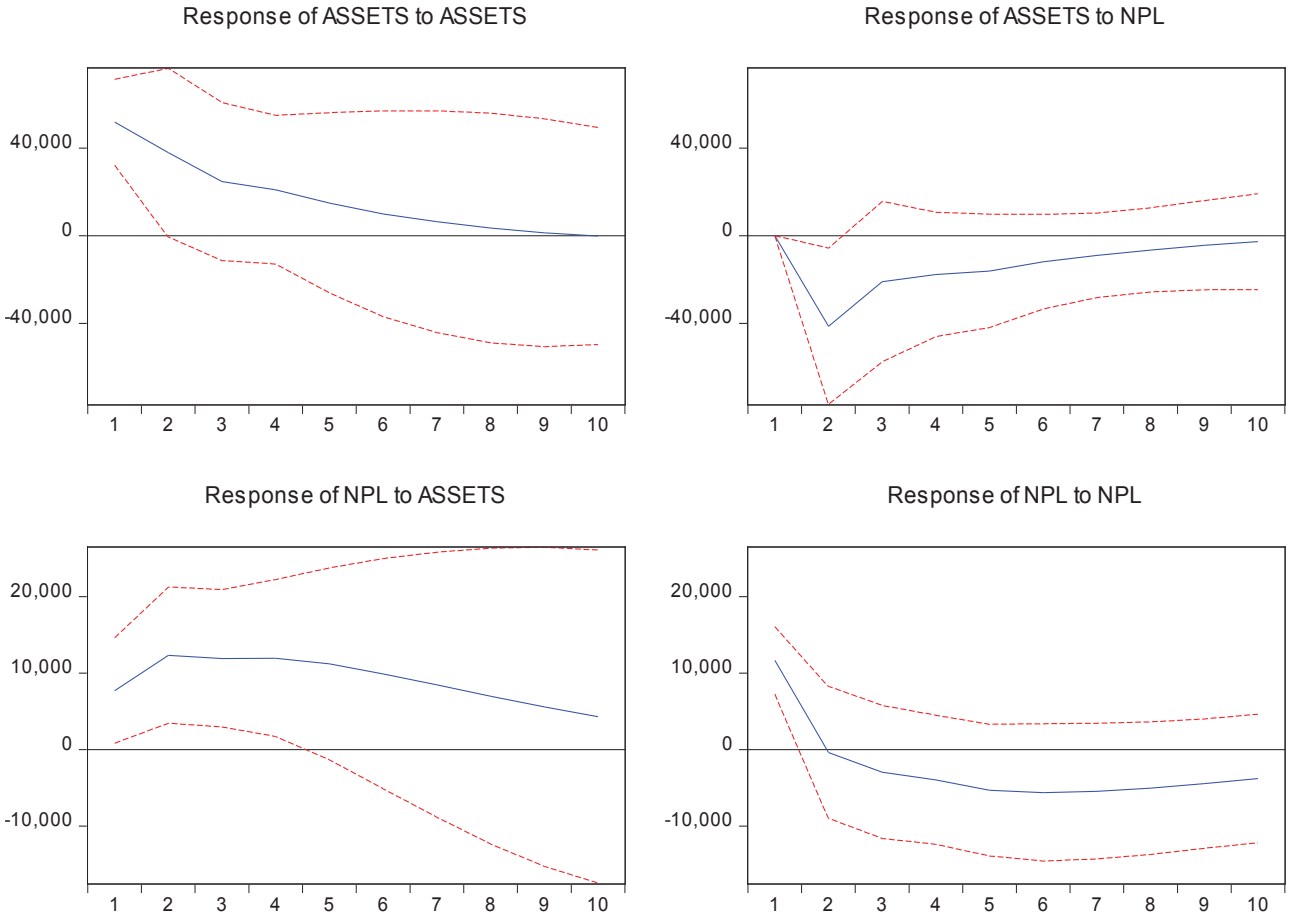

Fig. 7. Impulse response function

Source: Compiled by the authors

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