Kovalenko Victoria
D.Sc. (Economics), Professor, Professor of the department of banking
Odesa National University of Economics, Ukraine in Odesa
8 Preobrazhenskaya Str., Odesa, 65082, Ukraine
kovalenko-6868@ukr.net

Sheludko Sergii
Ph.D. (Economics), Associate Professor, Project & Program Manager of the Department of Valuation and Collateral Operations,
Pivdenny Bank PJSCб
6/1 Krasnova Str., Odesa, 65059, Ukraine
e-mail: s.szeludko@gmail.com

CAPITAL ADEQUACY AS THE INDICATOR OF UKRAINIAN BANKS' FINANCIAL STABILITY

Abstract. The paper determines that at the current stage of Ukrainian banks' functioning, an important problem is the improvement of the mechanisms for ensuring the adequacy of their capital as a key factor in the development of the strategy for financially sustainable development of the banking system in Ukraine. Crisis phenomena in recent decades have caused a resonance on global and national financial markets regarding the introduction of effective instruments for regulating the capital adequacy of banks. The structural and logical scheme of the analysis of the capital stability of banks is implemented in the following stages: the evolutionary study of international and national standards regarding the regulation of the capital adequacy; construction of the system of indicators characterizing a level of capital stability of banks; grouping of banks according to the level of their capital stability on the basis of clusterization; qualitative characteristics of the obtained clusters; determination of strategic directions for further capitalization of banks. The proposed structural and logical scheme was tested on the example of operating banks in Ukraine as of 01.12.2023. Its use made it possible to determine promising directions for further research in the field of bank capitalization management, e.g. making changes to the regulatory framework with the aim of stimulating investments in bank shares, in particular creating opportunities to determine the share exchange rate during M&A of banks on a market basis; implement measures to further improve the activity of the stock market, in particular, its transparency; implement a dividend policy aimed at ensuring high capitalization indicators of banks; to intensify the processes of reorganization of banks, in particular – of their associations based on

merger, for which to provide tax benefits, simplification of organizational procedures.
Key words: bank; management; capital; capital adequacy of banks; economic regulations; cluster analysis; coefficient method; strategy; financial stability.
JEL classification: G21, G24, G29

Introduction

Capital adequacy of banks today is the main indicator of increased trust in banking systems on the part of society. That is why the issue of assessing the adequacy of banks' capital to cover the risks they are exposed to in the course of their activity is given considerable attention both in international and national banking.

The problem of bank capital adequacy has been the subject of scientific research and disputes between banks and regulatory bodies for a long time. Commercial banks prefer a minimum amount of capital to improve return on equity and asset growth. Banking supervisors require more capital to reduce the risk of bankruptcy. At the same time, it is claimed that bankruptcy is caused by dissatisfactory management, that is, banks with high quality management can successfully function with low capital standards (Kovalenko, 2022).

Currently, the regulators of various countries have begun to increase the requirements for bank capital. At the international level, the Basel Committee on Banking Supervision has developed additional capital standards (Basel III, Basel IV) that considered the consequences of the crisis. For the bank system of Ukraine, there is a significant deficit in terms of capital adequacy, and the problem of its adequacy is currently particularly relevant in the conditions of cyclical economic development, especially during wartime.

Today, significant attention is paid to the implementation of international standards for the regulation of bank capital, especially the consideration of operational, credit, market and other risks when determining the adequacy of bank capital (Rossignolo, 2020; Scott, 2023; Kusi, 2023).

In the context of ensuring the financial stability of banks, the expediency of introducing new regulatory requirements of the National

Bank of Ukraine is being considered, namely: introduction of the net stable financing ratio, activation of capital buffers, introduction of assessment of internal capital adequacy and internal liquidity, requirements for capital coverage of operational and market risks and the new capital structure of banks (Vartsaba, 2021; Mulyk, 2021).

As part of the development of methodological basics for assessing economic capital under unexpected risks, it is necessary to specify the list of factors that should be considered when determining the default for a certain debt instrument; applied features of consideration the effect of concentration of relevant types of debt instruments to ensure effective allocation of capital. It is also necessary to control the concentration risk and assess its impact on the bank's profit planning, including by using RAROC instrument. It makes possible to calculate such a rate of return on capital, which will reflect the risk appetite of the bank and, in the future, to determine priorities in the development of certain business lines to ensure the compatibility of profitability indicators, the volume and spectrum of risks and the amount of capital to cover probable losses for it (Vovchak, 2020).

However, insufficient attention is paid to the analysis of the capital adequacy of banks regarding the possibility of introducing regulatory requirements, which is important, since the ability of banks to fulfill regulatory values affects the level of their financial stability and the ability to level the risks associated with their activities.

1. Methods and instruments for assessing banks' capital adequacy

The bank capital adequacy can be assessed through their ability to perform such basic functions inherent to them as protective, operational and regulatory, which are defined in accordance with the Law of Ukraine “On Banks and Banking Activity” (National Bank of Ukraine, 2000).

Dulska V. expanded the range of functions of bank capital, which increase its significance in ensuring the stable functioning of banks. The author singled out the following functions: current (insurance function for depositors' and creditors' funds, investment, innovation, guarantee, con-

trol, regulatory, yield function, evaluation, coordination) and strategic (indicative, mobilization, communication, stimulating) (Dulska, 2010).

To regulate bank capital in global practice, a number of standards were developed, of which Basel I, Basel II, Basel III, Basel 3.5 and Basel IV are currently in effect. Their general characteristics are given in Table 1.

Table 1: **Evolution of international standards for regulation of bank capital adequacy**

Name of the standard	Main objectives of the standard
Basel I, «International convergence of capital measurement and capital standards» (BCBS, 1988)	banks must have sufficient capital to cover their risks; level the competitive conditions between international banks; facilitate the comparison of banks' capital positions
Basel II, «International Convergence of Capital Measurement and Capital Standards: a Revised Framework» (BCBS, 2004)	the main emphasis was placed on self-regulation and market discipline; experienced banks are allowed to develop internal risk assessment models to calculate the required amount of capital to cover them, thereby solving the Basel I problem by applying regulatory capital arbitrage; the possibility of developing their own risk models led to the fact that banks underestimated the risks in their loan portfolios and, accordingly, this allowed them to significantly reduce the required amounts of capital
Basel III, «A global regulatory framework for more resilient banks and banking systems» (BCBS, 2010)	narrowing of the items that are taken into account when calculating capital (reducing the use of hybrid debt instruments that are included in capital) and increasing the necessary capital adequacy standards
Basel 3.5, «Finalising post-crisis reforms» (Finalizing Basel III IN BRIEF 2017)	solves the incentive problems related to the banks' minimization of calculated risk weights with the growth of their own internal models, in order to minimize regulatory capital requirements; to soften these incentives, the so-called minimum levels were defined: a percentage of the standard weighted risk factors established by the supervisory authorities, below which the capital cannot be; it was decided to introduce minimum levels in stages over five years; the initial values will be introduced from January 2022 and set at 50% of the standardized risk weights, and will then increase by 5% each year between 2022 and 2026 until they are set at 70% and then finally increase to 72.5% in 2027

Basel IV, «Endgame», (Pricewaterhouse Coopers, 2018)	introduction of the minimum level of capital requirements calculated according to internal models; is a fixed level for all RWAs calculated using SA below which the amount of IRB-based RWAs cannot be reduced; the chosen threshold is 72.5% of RWA calculated using SA; for example, if a bank uses IRB to calculate its RWA, the total cannot be less than 72.5% of that bank's RWA calculated using SA

Source: Compiled by the authors based on (Kovalenko, Sheludko, 2021)

Before the full-scale Russian invasion of Ukraine, the National Bank of Ukraine developed a plan to introduce new regulatory requirements for bank capital and liquidity. But it was suspended due to martial law. Today, the National Bank of Ukraine regulates the capital adequacy of banks on the basis of the Instruction "On Regulation of Banks of Ukraine" (National Bank of Ukraine, 2001). In accordance with it, the following capital standards are calculated:

Norm of sufficiency (adequacy) of regulatory capital (N2), which reflects the bank's ability to timely and fully settle its obligations arising from trade, credit or other monetary transactions. The higher the value of this indicator, the greater the share of risk assumed by the bank owners; and vice versa, the lower the value of the indicator, the greater the share of risk assumed by the bank's creditors/depositors. The normative value of the standard H2 of operating banks must be at least 10%.

Norm of main capital adequacy (N3) is defined as the ratio of capital to the sum of assets and off-balance sheet liabilities weighted by the appropriate credit risk factors. The normative value of standard H3 should be at least 7%.

The instruction stipulates that banks must form capital buffers: conservation buffer; countercyclical buffer; buffer of system importance (in case a bank acquired the status of a systemically important); systemic risk buffer.

Today, Ukraine is obliged to implement the norms of EU legislation to capital adequacy, namely: fulfillment of the terms of the Association Agreement between Ukraine and the European Union; Memorandum with the IMF on economic and financial policy dated June 19, 2023 (paragraph

52 F "Financial sector"); The Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding the Improvement of Issues of Organization of Corporate Governance in Banks and Other Issues of the Functioning of the Banking System" dated 30.06.2021 No. 1587-IX (coming into effect on 05.08.2024 updated requirements of the Law of Ukraine "On Banks and banking activity", in particular regarding the capital structure and its adequacy).

The main EU capital requirements and their implementation in Ukraine are presented in Figure 1.

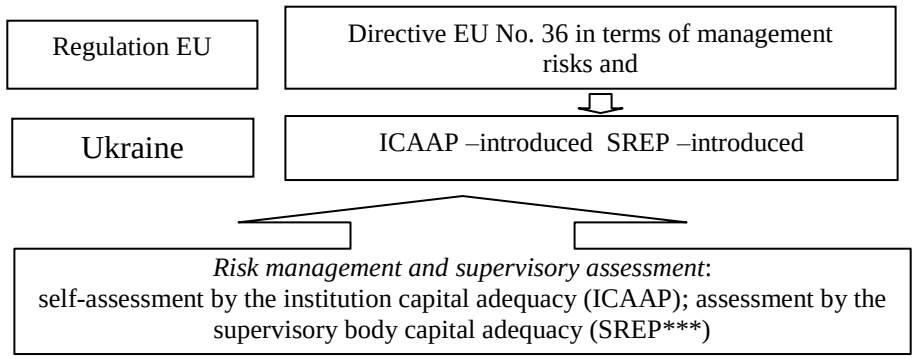


Fig. 1.1: Pillar II

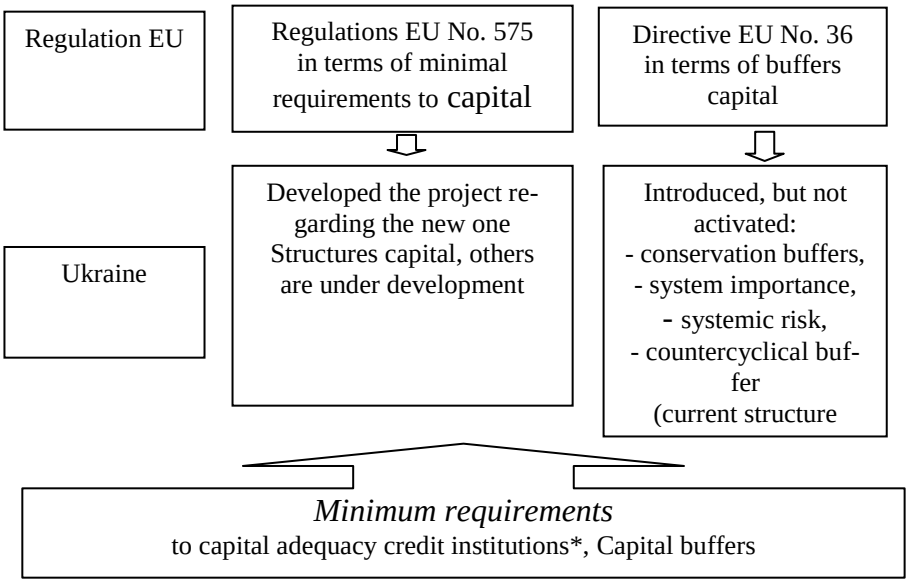


Fig. 1.2: Pillar I

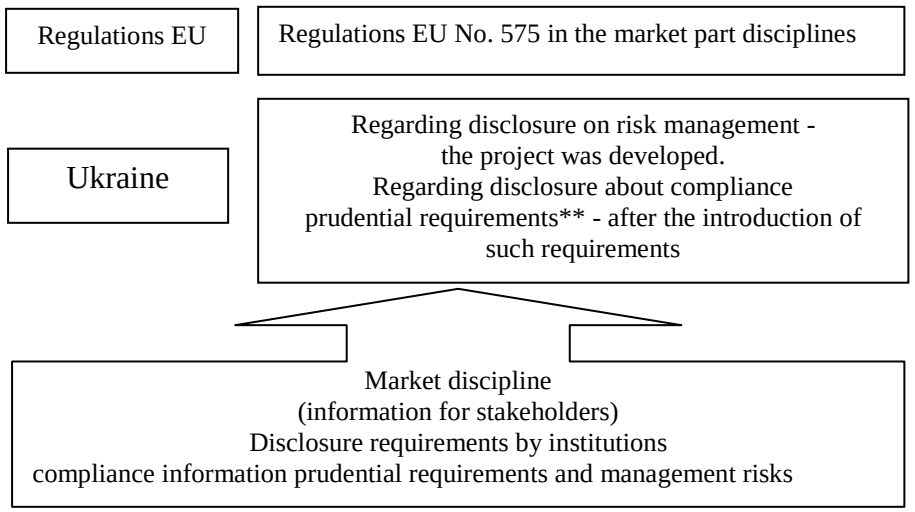


Fig. 1.3: Pillar III

* credit institutions include: banks; credit institutions that attract deposits; investment firms

** on capital, liquidity, credit risk, leverage, ESG

*** Supervisory Review and Evaluation process

Fig. 1: **Implementation of EU requirements for bank capital in Ukraine**

Source: Compiled by the authors

It should also be noted that the regulation of the adequacy of bank capital in Ukraine is partially implemented through macroprudential policy instruments. Their status and degree of implementation are presented in Table 2.

Table 2: **Tools of macroprudential policy and the extent of their use in Ukraine**

Tools	Implemented	Not implemented	Partially implemented
Restrictions on open currency positions	+		
Countercyclical buffer (0-2.5 %)			+
Systemic risk buffer (up to 3%)			+

Capital conservation buffer 2.5%			+
Liquidity buffers		+	
System importance buffer up to 2 %	+		
Liquidity coverage ratio	+		
Net stable funding ratio	+		
Coefficients of the ratio of the total amount of credit and income			+
LTV ratios			+
Stress testing	+		

Source: (Lobova, Moskalyuk,2023)

It should be noted that Ukraine currently faces obligations regarding the implementation of EU legislation on capital adequacy, namely: implementation of the association agreement between Ukraine and the European Union; implementation of the memorandum with the IMF on economic and financial policy dated June 19, 2023; introducing amendments to the Law of Ukraine "On Banks and Banking Activity", in particular, regarding the capital structure and its adequacy, which will come into effect on August 5, 2024.

2. Assessment of the level of capital adequacy of Ukrainian banks

The next stage of the research is the analysis of compliance of banking capital in Ukraine with international standards. It is appropriate to consider the dynamics and capital structure of banks (table 3).

Table 3: **Dynamics and structure of banks capital in Ukraine in 2020-2022.**

Articles of capital	2020		2021		2022	
	UAH bln	%	UAH bln	%	UAH bln	%
Share capital	479,3	228,8	481,4	188,4	406,2	185,9
Emission differences	14,2	6,8	14,8	5,8	14,5	6,7
Unregistered authorized capital	0,59	0,3	0,11	0,0	0,84	0,4
Other additional	-0,05	0,0	0,44	0,2	-0,003	0,0

capital						
Reserve and other funds of the bank	25,4	12,1	33,35	13,1	42,6	19,5
Revaluation reserves	19,1	9,1	15,04	5,9	-1,32	-0,6
Retained earnings (uncovered loss)	-329,1	-157,1	-289,7	-113,4	-2442,9	-111,8
Total equity	209,5	100,0	255,5	100,0	218,5	100,0

Source: Compiled by the authors based on (National Bank of Ukraine, 2023)

As shown in Table 3, the largest specific weight in the capital structure of banks is the authorized capital, which in 2022 amounted to UAH 406.2 billion. However, the uncovered loss of banks in the capital structure remains quite high. For reference, for 11 months of 2023, the capital of Ukrainian banks amounted to UAH 337.4 billion.

If we consider the leading banks of Ukraine with the largest regulatory capital, the top five in 2022 will include: JSC CB PrivatBank, JSC Oschadbank, JSC Raiffeisen Bank, JSC Ukrsibbank, JSC PUMB. The dynamics of their regulatory capital over the past five years is presented in Table 4.

As can be seen from the data in Table 4, JSC CB "PrivatBank" has the largest regulatory capital in terms of size during the entire researched period, while its size has increased almost 3 times over the past 5 years (by 178.81%). The rates of growth of regulatory capital at JSC "PUMB" were practically the same. The bank increased its capital by 135.72%; JSC "Ukrsibbank" increased regulatory capital by 98.83%.

Table 4: **Dynamics of the regulatory capital of the largest banks of Ukraine in 2018-2022, UAH million.**

Bank	2018	2019	2020.	2021.	2022	Growth rate 2022/2018
PrivatBank	19555,7	19223,6	35256,9	41876,6	54523,5	+178,81
Oschadbank	13200,5	12355,5	18132,4	18113,4	19427,4	+47,17
Raiffeisen Bank	10480	10674	10474	13092	15223	+45,26
Ukrsibbank	6405,1	6108,4	7245,4	9214,2	12735,3	+98,83
PUMB	5282,3	7914,9	8589,5	11687,4	12451,1	+135,72

Source: (National Bank of Ukraine, 2023)

In two other banks, Oschadbank and Raiffeisen Bank, the growth rates were not so significant, but amounted to almost 50%.

However, it should be noted that the hryvnia exchange rate has decreased significantly over the past year, and such capital growth may be associated with inflationary processes. Let's consider the dynamics of the regulatory capital of the largest banks of Ukraine in 2018-2022 in USD terms (Table 5).

Table 5: **Dynamics of regulatory capital of the largest banks of Ukraine in 2018-2022 in USD**

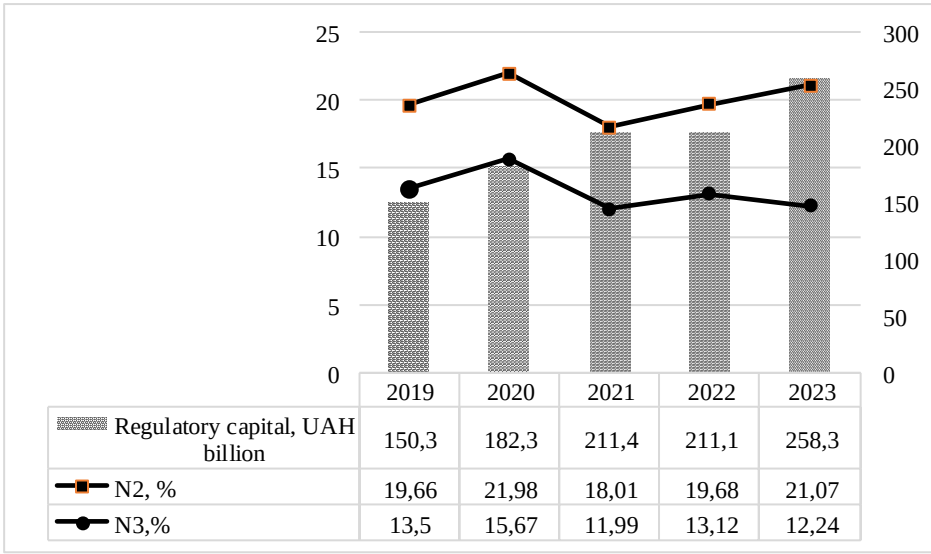
Bank	2018	2019	2020.	2021.	2022	Growth rate 2022/2018
PrivatBank	706,24	811,46	1247,15	1535,07	1490,93	+111,11
Oschadbank	476,73	521,55	641,40	663,98	531,24	+11,44
Raiffeisen Bank	378,48	450,57	370,50	479,95	416,27	+9,99
Ukrsibbank	231,31	257,85	256,29	337,76	348,24	+50,55
PUMB	190,76	334,10	303,84	428,43	340,47	+78,48

Source: Compiled by the authors based on (National Bank of Ukraine, 2023)

According to the data presented in Table 5, more appropriate conclusions can be drawn. Thus, in 2020, three out of five surveyed banks noted a fall in the level of regulatory capital compared to the previous year, which is quite logical given then-current moratorium on the return of bank loans and debt collection.

In 2022, when the banks' regulatory capital was transferred to the dollar equivalent, all banks received a decrease in their regulatory capital. The above is expected in connection with the temporary loss of part of the controlled Ukrainian territories, and therefore bank branches in the occupied territories, a decrease in the ability of households and non-financial corporations to repay loans. As a result, over the past five years, the regulatory capital of these banks had a tendency to grow. Thus, the regulatory capital of JSC CB “PrivatBank” increased by 111.11%, and the regulatory capital of JSC “Raiffeisen Bank” – by only 10%.

It is worth considering the dynamics of the regulatory capital as a whole in the system and the standards for the fulfillment of banks' capital adequacy (Fig. 2).



	2019	2020	2021	2022	2023
Regulatory capital, UAH billion	150,3	182,3	211,4	211,1	258,3
N2, %	19,66	21,98	18,01	19,68	21,07
N3,%	13,5	15,67	11,99	13,12	12,24

N2 – Norm of sufficiency (adequacy) of regulatory capital (at least 10 %);
N3 – Standard capital adequacy ratio (at least 7 %)

Fig. 2: **Dynamics of the regulatory capital of Ukrainian banks and the level of their fulfillment of economic standards of its sufficiency for the period 2019-2023**

Source: Compiled by the authors based on (National Bank of Ukraine, 2023)

It is necessary to consider the value of profitability of capital and assets (Fig. 3).

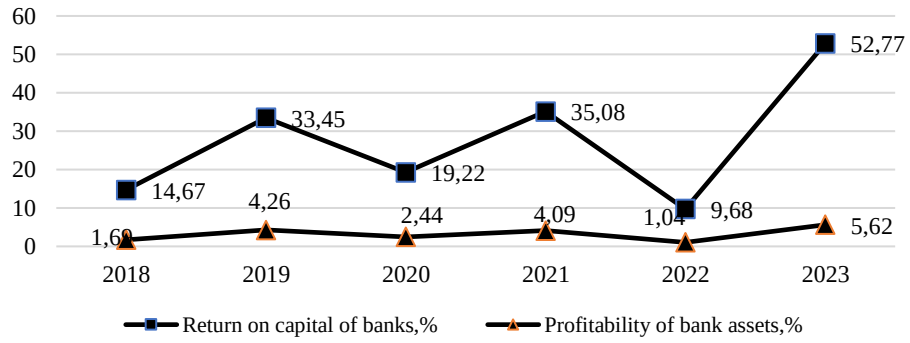


Fig. 3: **Dynamics of profitability indicators and assets**

Source: Compiled by the authors

As shown in Fig. 3, over the past five years, Ukrainian banks have achieved significant results in terms of return on assets and capital. The lowest value is observed in 2018, but this is caused by the fact that, starting from 2017, Ukrainian banks began to emerge from a depressed state, when until then they received losses.

3. Clustering of banks of Ukraine according to the level of their capital stability

On the eve of russians' invasion, Ukrainian banks had a significant reserve of capital, in particular, a buffer was formed for the retail unsecured portfolio, which the banks were now able to use. Also, despite all the challenges, banks remain profitable. However, current capital figures do not fully reflect the losses of banks as a result of the war. Banks are slowly forming loan reserves, especially when it comes to the corporate segment. This is explained by hopes for the recovery of the debtors' business.

In this context, attention should be paid to such an indicator as the capital stability of banks, the results of which evaluation are presented in Table 6.

Table 6: **Dynamics of indicators of capital stability of the banking system of Ukraine in 2018–2022, billion UAH**

Indicator	Optimal value	2018 .	2019	2020	2021	2022
Capital		154,9	199, 9	209,5	255,5	218,5
Share capital		465,5	470,7	479,9	481,5	407,0
Raised funds		938,6	1077,2	1363,1	1526,7	1876,3
Assets		1359,7	1493,3	1822,8	2053,2	2353,6
Coefficient of reliability, %	≥ 5%	16,51	18,56	15,37	16,74	11,65
"Financial leverage" ratio,	1:20	6,06	5,39	6,51	5,98	8,59

times						
Coefficient of capital participation in the formation of assets, %	≥ 10%	11,40	13,39	11,49	12,44	9,29
Capital multiplier factor, once	he lower -the better	2,92	3,17	3,80	4,26	5,78

Source: Compiled by the authors based on (National Bank of Ukraine, 2023)

Thus, the banking system is currently highly leveraged and therefore has sufficient own funds to place in credit assets and investments.

The financial leverage ratio at the maximum allowable ratio of 1:20 was 5.89 on January 1, 2022, and increased to 8.59 on January 1, 2023. This indicates that the banking system has become more dependent on attracting free funds on the money market. The ratio of equity participation in the formation of assets in 2022 did not meet the recommended value, which was affected by the situation in the country related to military actions. In the other studied periods, the recommended value was fulfilled. As for the coefficient of the capital multiplier, which characterizes the degree of coverage of assets by equity capital, it constantly increased in dynamics, which is also an indicator that characterizes the decrease in the resource stability of domestic banks. From the results of the calculated indicators, it can be concluded that the financial stability of the banking system in 2022, despite its compliance with NBU regulations, slightly decreased. The main problem is a possible further decrease in the event of a prolongation of the military conflict on the territory of Ukraine. In this case, the future collapse of the banking system is possible, which will entail a long-term economic crisis and slow down the recovery of the state's economy.

In order to determine the level of capital stability of Ukrainian banks, the cluster analysis was conducted. The following indicators were used to assess the capital stability of banks and carry out rational clustering of banks: adequacy (adequacy) of regulatory capital, reliability coefficient, capital participation coefficient in the formation of assets, equity protecti-

on coefficient, capital profitability. Cluster analysis was performed using the "STATISTICA 10" software, the obtained results are presented in Figure 4. Since sample element C_63 (JSC "Alpari Bank") is significantly distant from others, which does not give a reliable idea of the possible number of clusters according to the given parameters, it was eliminated.

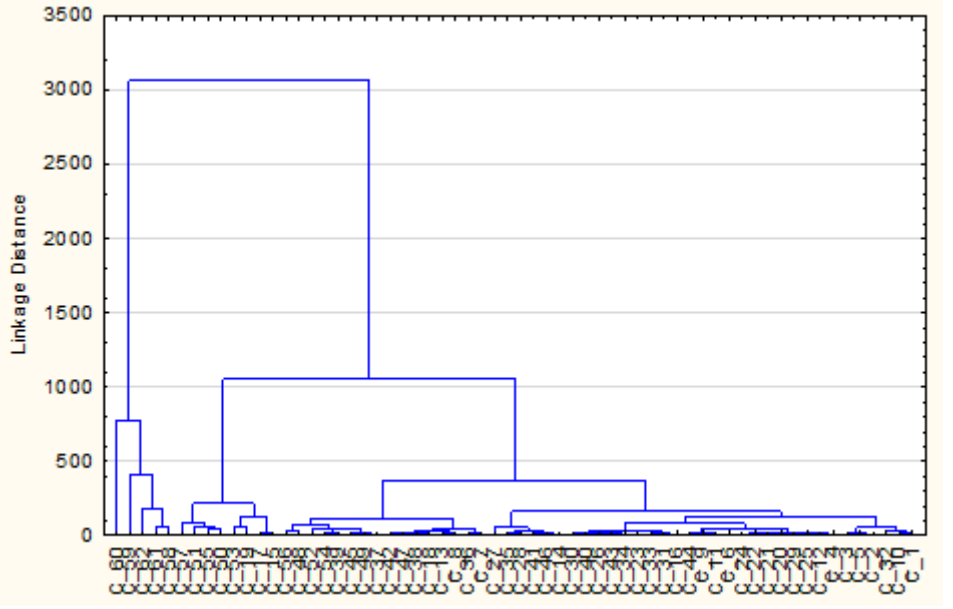


Fig. 4: **Dendrogram of Ward's method clustering for 62 cases**
Source: Compiled by the authors

From the data of Fig. 5, it is possible to determine which of the variables used for the analysis were most used to select clusters. It follows from the presented that variables X2 – X4 (capital participation in the formation of assets ratio, capital protection ratio and ROE) practically do not distinguish groups of elements. Clustering took place on the basis of variables X1, X5 and X6 (respectively, the reliability coefficient, standards N2 and N3), and the greatest difference is shown by the reliability coefficient (X1).

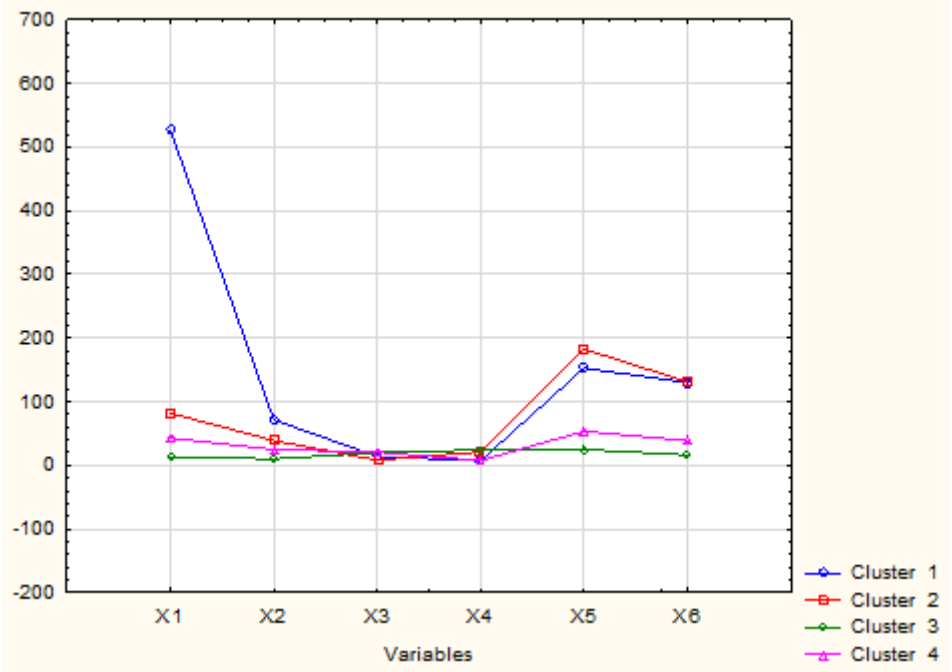


Fig. 5: **Graphic representation of clustering criteria impact**

Source: Compiled by the authors

The distribution of sample elements by clusters and descriptive statistics of each group are presented in Table 7.

As shown in Table 7, the first cluster includes 4 banks. These institutions are characterized by a low level of capital stability, which is obtained by the imbalance of all coefficients taken for calculation in relation to the recommended values.

The second cluster includes 5 banks. The unifying indicator for this cluster is the return on capital and the reliability coefficient. These banks are characterized by an average level of capital stability.

The third cluster includes 35 banks. Banks of this cluster are noted as the most adequate in terms of capital stability, based on the fact that all indicators correspond to the recommended values.

Table 7: **Peculiarities of clusters regarding the determined indicators of the level of capital stability of Ukrainian banks as of 01.12.2023, %**

Cluster	The average value of the indicator by cluster					
	Coefficient of reliability	the ratio of capital participation in the formation of assets	capital protection factor	return on capital	Norm of sufficiency (adequacy) of regulatory capital	Norm of adequacy of fixed capital
I (4 banks)	526,4	71,5	13,9	7,1	153,0	130,1
II (5 banks)	82,0	39,0	8,2	21,2	183,0	130,8
III (35 banks)	13,4	10,1	20,4	24,1	25,0	16,2
IV (18 banks)	42,9	24,9	20,8	7,7	53,4	38,7
Recommended value	< =5%	>= 10%	> 25 %	growth	< = 10%	< = 7%

Source: Compiled by the authors

This cluster includes such banks as: JSC CB “PrivatBank”, JSC “Oschadbank”, JSC “Ukreximbank”, JSC “Ukrgasbank”, JSC “Sense Bank”, JSC “Raiffeisen Bank”, JSC “OTP Bank”, JSC “Credit Agricole Bank”, JSC “Citibank”, JSC “Kredobank”, JSC “Procredit Bank”, JSC “ING Bank Ukraine”, JSC “Pravex Bank”, JSC “Piraeus Bank MKB”, JSC “PUMB”, JSC “Universal Bank”, PJSC Bank “Pivdenny”, JSC “Taskombank”, JSC “A – BANK”, PJSC “BANK VOSTOK”, JSC Bank “Credit Dnipro”, JSC CB “Acordbank”, PJSC “MTB Bank”, JSC “Bank Alliance”, JSC “MIB”, JSC CB “Globus”, JSC “Idea Bank”, JSC CB “Lviv”, JSC “Combank”, JSC “Radabank”, JSC “Agroprosperis Bank”, JSC “Unex Bank”, JSC “RVS Bank”, JSC “Sky Bank”.

The fourth cluster includes 18 banks and is characterized by a sufficient level of capital stability.

In general, the regulator's anti-crisis measures regarding the capitalization of Ukrainian banks should be aimed at the application of the NBU's policy on the development and operation of banks, considering the

regional features of the economy and the social sphere; introduction of the additional capitalization mechanism of the largest banks; stimulation by the state of creation of conditions for maximum promotion of capitalization of banks at the regional level; development of a strategy for exiting the market of insolvent and unsustainable banks through their reorganization.

Conclusions

The development of the banking system of Ukraine requires a balanced and well-founded strategy, which should be based on the following conceptual provisions: consolidation of banks based on merger and acquisition procedures with the participation of foreign and state investments, provision of phased capitalization of banks based on public placement of shares and creation of systems to protect the interests of minority shareholders, ensuring the transparency of information regarding the real owners of a bank, strengthening the responsibility of the owners and management of banks for distorting financial reporting data, preventing the withdrawal of owners' capital directly from a bank, creating a rehabilitation bank and an effective mechanism for improving the balance sheets of banks, ensuring an effective system of monitoring the domestic banking sector, forming the banking system, competitive in the conditions of financial globalization and adequate to the needs of the domestic economy.

This strategy should be aimed at restoring trust as the basis for the stable functioning of banks.

Therefore, based on the need to increase the stability of Ukrainian banks and increase trust in them, it is advisable to make changes to the regulatory framework in order to stimulate investments in bank shares, in particular, to create opportunities to determine the share exchange ratio during M&A of banks on a market basis; implement measures to further improve the activity of the stock market, in particular, its transparency; implement a dividend policy aimed at ensuring high capitalization indicators of banks; to intensify the processes of reorganization of banks, in particular – of their associations based on merger, for which to provide tax benefits, simplification of organizational procedures. Also, in Ukrai-

ne, the possibilities of creating banking groups and holdings to solve the problems of bank capitalization are not sufficiently used. The above constitutes reserves for increasing the efficiency of banking activities in Ukraine, and therefore should be involved in the economic revival of the country.

Bibliography

DULSKA, V. I. (2010). Own bank capital, its functions and components. Herald. *Zhytomyr State Technological University. Series: Economic sciences*, 3 (53), 3, 127-130 http://ven.ztu.edu.ua/issue/view/4007.

KOVALENKO, V., SHELUDKO, S., RADOVA, N., MURSHUDLI, F., & GONCHAR, K. (2021). International standards for bank capital regulation. *Financial and credit activity : problems of theory and practice*, 1 (36), 35–45. DOI: https://doi.org/10.18371/fcaptp.v1i36.227609.

KOVALENKO, V.V. (2022). Capital adequacy of banks: modern measurement and further research. *Socio-economic research bulletin*, 1-2 (80-81), 77–94. DOI: https://doi.org/10.33987/vsed.1-2(80-81). 2022.77-94.

KUSI, BAAH AYE, FORSON, JOSEPH ATO, ADU-DARKO, EUBICE (2023) Global financial crisis, international capital requirement and bank financial stability: an international evidence. *Journal of financial regulation and compliance*, 31, 2, 237 – 258. DOI: 10.1108/JFRC-04-2022-0057.

LOBOVA, O.M., MOSKALYUK, M.Yu. (2023). The practice of using tools for regulating the banking activity of Ukrainian banks. *Economy and society*, 50. https://economyandsociety.in.ua/index.php/journal/article/view/2347/2268.

MULYK, T. O., MULYK Ya. I. (2021). Assessment of capital adequacy of domestic banks as a guarantee of their reliability *Efficient economy*, 7. DOI: 10.32702/2307-2105-2021.7.73.

NATIONAL BANK OF UKRAINE (2000). *On banks and banking activities: Law of Ukraine.* http://zakon1.rada.gov.ua/laws/main/2121-14.

NATIONAL BANK OF UKRAINE (2001). On the procedure for regulating the activity of banks in Ukraine. https://zakon.rada.gov.ua/laws/show/z0841-01#Text

NATIONAL BANK OF UKRAINE (2023). Supervisory statistics .Official website https://bank.gov.ua/ua/statistic/supervision-statist.

ROSSIGNO, A. F. (2020). Basel 3.5 vs. Basel III : a radical overhaul of the capital requirements pillar. The case of commodity exposures. *Banking, Accounting and Finance*, 11 (1), 1–34.

SCOTT, P. ANDREV, LABONTE MARC (2023). Bank Capital Requirements: A Primer and Policy Issues. *Congressional Research Service*. March 9. https://crsreports.congress.gov/product/pdf/R/R47447.

VARTSABA, V. I. (2021). Assessment of the financial stability of the banking system of Ukraine and its ways removal in the conditions of the coronavirus pandemic. *Scientific Bulletin of Uzhhorod University*, 2021, 1 (57), 107-113. DOI: https://doi.org/10.24144/2409-6857.2021.1(57).107-113.

VOVCHAK, O.D., DMYTRENKO, I. B. (2020). Taking into account the risk of concentration within the framework of the concept internal procedures for assessing the bank's capital adequacy: methodological and applied aspects. *Bulletin of the University of Banking*, 2 (38), 11-20. DOI: https://doi.org/10.18371/2221-755x2(38)2020219690.