

CONCENTRATION OF THE UKRAINIAN BANKING SYSTEM: PROBLEMS AND PROSPECTS**Tetiana Kubakh**

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The article examines the relevance of the issue of concentration of the banking system of Ukraine and identifies the main prospects for reducing the share of the state in the banking services market. The period from 2009-2022 inclusive was chosen for analysis and evaluation, which made it possible to identify the main trends and factors that influenced the growth and decline of such concentration indices as Herfindahl–Hirschman Index and CR in terms of the following indicators: assets, corporate loans, retail deposits, authorised capital, commission income, and interest income. The obtained calculations helped to determine the level of concentration of the domestic banking system. The purpose of the article is to allocate scientific approaches and carry out practical calculations to determine the degree of concentration of the banking system and to determine the need for its deconcentration. The results of the analysis demonstrate the growing scientific interest of both domestic and foreign economic schools in the problem of concentration in the banking system. However, it is worth noting that the peak of publication activity was observed in 2018-2020, with the top three countries being the United States of America, the United Kingdom, and Malaysia. The results of the calculations showed that the number of banks in Ukraine does not have a significant impact on the level of concentration. With a fairly large number of banks in 2013, namely 180 institutions, there was a sharp increase in concentration, but a larger share of the market was controlled by private capital, but since 2017, a larger share of the banking sector has been owned by the state. The author notes that the concentration of market power by state-owned banks has led to the emergence of a monopoly, but transformational measures to reduce the concentration of the banking system should be carried out taking into account the existing financial and economic feasibility. Of course, there is a risk of ineffective management decisions by bank management, but it is the largest state-owned banks that demonstrate the sustainability and profitability of their activities.

Keywords: banking system, concentration of the banking system, monopolisation, competition.

**КОНЦЕНТРАЦІЯ БАНКІВСЬКОЇ СИСТЕМИ УКРАЇНИ:
ПРОБЛЕМИ ТА ПЕРСПЕКТИВИ****Тетяна Кубах¹**¹кафедра фінансових технологій і підприємництва, Сумський державний університет, Україна.

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У статті досліджено актуальність проблематики концентрації банківської системи України та визначено основні перспективи зниження частки держави на ринку банківських послуг. Для аналізу та оцінки було обрано період з 2009-2022 рік включно, що дало можливість виявити основні тенденції та фактори які вплинули на зростання та падіння таких індексів концентрації як Херфіндаля–Хіршмана та CR в розрізі наступних показників: активи, кредити юридичних осіб, депозити фізичних осіб, статутний капітал, комісійні доходи, процентні доходи. Отримані розрахунки сприяли визначенню рівня концентрації вітчизняної банківської системи. Метою статті є виокремлення наукових підходів та проведення практичних розрахунків задля визначення ступеню концентрації банківської системи, з'ясування необхідності її деконцентрації. Результати аналізу засвідчили зростання наукового інтересу як вітчизняної так й іноземної економічної школи до проблеми концентрації в банківській системі. Але варто відмітити, що пік публікаційної активності спостерігався у 2018-2020 роках, а в трійку лідерів увійшли Сполучені Штати Америки, Велика Британія, Малайзія. Результати розрахунків довели, що кількість банків в Україні не має значний вплив на рівень концентрації. При достатньо великій кількості банків у 2013 році, а саме 180 установ, спостерігалось різке зростання концентрації, але більша частка ринку була під контролем приватного капіталу, але з 2017 року вже більша частка банківського сектору належить державі. Автором було зауважено, зосередження ринкової влади державними банками призвело до виникнення монополії, проте трансформаційні заходи в напрямку зниження концентрації банківської системи необхідно проводити зважуючи на існуючу фінансову та економічну доцільність. Безумовно є ризик неефективності управлінських рішень менеджментом банків, але саме найбільші державні банки демонструють стійкість та прибутковість своєї діяльності.

Ключові слова: банківська система, концентрація банківської системи, монополізація, конкуренція.

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INTRODUCTION

The banking system of Ukraine, as an integral part of the financial system, is constantly undergoing reforms under the pressure of global and domestic factors. Undoubtedly, professional regulation and control are the key to stability and efficiency in the face of constant transformations and challenges.

Stable and sustainable functioning of the banking system in peacetime, and especially in wartime, should ensure the efficiency of the economy and the resilience of the financial system.

The main trend of the last ten years has been a decrease in the number of banks, which leads to increased concentration in the banking system. On the one hand, this is a positive aspect, as increased financial strength makes it possible to finance large investment projects, a significant number of business entities, act as investors in government bonds, and introduce high-tech tools into the bank's operations. On the other hand, a bank that is too large poses a threat of systemic disruption in the event of its bankruptcy. Therefore, the issue of loss of solvency by such market participants is unacceptable, which requires additional funding from the state if necessary.

The existence of «too big to fail» entities in the market gives financial services consumers confidence in the stability of both the market participant and the entire system, while at the same time this situation creates additional risks for competition. However, it is necessary to pay attention to the owner of the concentrated capital, which may be a foreign or domestic business or the state. The monopolisation of the banking system by foreign capital provides access to financial resources from international markets, while at the same time posing a threat to the regulator's ability to implement monetary policy in the interests of the state. With the growing concentration of state-owned banks, it is possible to implement socially and economically important programmes or the state, while at the same time increasing attention to the issue of professional management of the market entity. The existence of systemically important banks increases the risks of loss of stability of the entire banking system in the event of external shocks, and also violates the principles of a market economy - only those banks that are able to solve their problems independently should operate in the market.

The experience of Western European banks has demonstrated that the rate of increase in profitability of medium-sized banking institutions is higher than that of market participants with monopoly features. Practical experience has shown that the principle of economies of scale is not always applicable to all types of banking services.

At the same time, the standardisation of national banking systems and the focus of bank operations solely on profit maximisation require management to take decisions aimed at capturing a larger market share, which in the long run can increase profitability.

International experience and domestic practice over the past decade have shown that market monopolisation is destructive in most cases, but when deciding to deconcentrate the banking system, the regulator should take a particularly responsible approach to this issue. The analysis of the situation in the banking services market in Ukraine in 2023 makes it possible to argue that the lack of lending to the real sector by banks did not depend on the size of banks at all, but lay in the plane of the greater attractiveness of NBU deposit certificates as an investment asset.

The purpose of the article is to identify scientific approaches and carry out practical calculations to determine the degree of concentration of the banking system and to determine the need for its deconcentration.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

The results of the study of scientific interest in the issue of concentration in the banking system by the number of publications in the journals included in the Scopus database show a growing trend over the period 2000-2022. At the same time, it is worth noting that the sharp increase in interest in this issue comes after a period characterised by crisis shocks: the global financial crisis of 2008, the European debt crisis of 2010, the economic crisis resulting from COVID-19 restrictions, the great war between Russia and Ukraine in 2022, and the escalation of military conflicts in the Middle East in 2023, all of which had a negative impact on the stability of the global financial system.

In 2020, the maximum number of publications dealing with the issue of banking system concentration was 58, and the minimum number was recorded in 2003 - 5 studies. Over the past year, the number of such publications totalled 50, which is 9% higher than in the previous year.

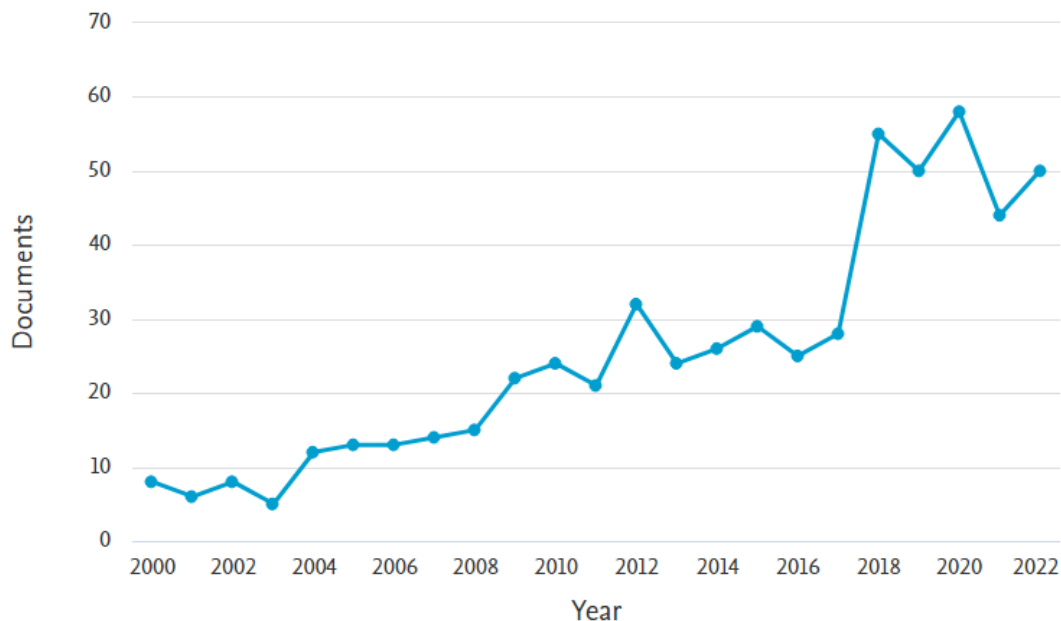


Figure 1. Dynamics of publication activity on the study of banking system concentration
Source: compiled by the authors based on Scopus data

During the analysed period, the total number of publications according to the Scopus database was 582 documents. The study by territory makes it possible to analyse the top 10 countries that have become leaders in terms of publication activity in the above-mentioned topics (Fig. 2). The largest number of papers was published in the United States - 111 documents, and the smallest - in Australia, namely 17 documents. As for Ukraine, its level of publication activity is average and amounts to 10 publications, which corresponds to the indicators of South Korea, Portugal, and the Czech Republic.

The analysis of empirical studies of the banking system concentration issue has made it possible to state that there are both advantages and disadvantages of this state of the system. The study of the world opinion on this issue demonstrates the ambiguity of views.

Thorsten Beck, Asli Demirgüç-Kunt and Ross Levine (2006) investigate the impact of national banking concentration, banking regulation and national institutions on the probability that a country will suffer from a systemic banking crisis. Based on their analysis, the authors found that crises are less likely to occur in economies with a more concentrated banking system, even after controlling for differences in the regulatory policies of commercial banks, national institutions that affect competition, macroeconomic conditions and shocks to the economy [1].

Amidu Mohammed and Wolfe Simo (2013) examine how the level of competition affects diversification and stability using 978 banks in 55 transition and developing countries over the eight-year period 2000-2007. The paper identifies a complex interaction between three key variables: the degree of market power of the bank, diversification and stability. The main conclusion is that competition enhances stability as it increases the diversification of both interest and non-interest bearing activities of banks. The analysis identified revenue diversification as a channel through which competition affects the risk of bank failure in developing countries [2].

Brian Akins, Lynn Li, Jeffrey Ng, Tjomme O. Rusticus (2016) studied the impact of competition on bank stability and concluded that banking institutions facing greater competition receive lower interest margins and make lower-risk investments, which leads to lower profitability. Researchers have found that banks that face more competition are less likely to be subject to regulatory action and less likely to fail. The paper focuses on the impact of competition on risk taking in the residential real estate market. It is proved that if the absence of competition encourages risky investment behaviour

in the residential mortgage market, this will lead to a greater supply of loans. Such lending would have led to an increase in property prices before the crisis and then to an even greater decline during the crisis.

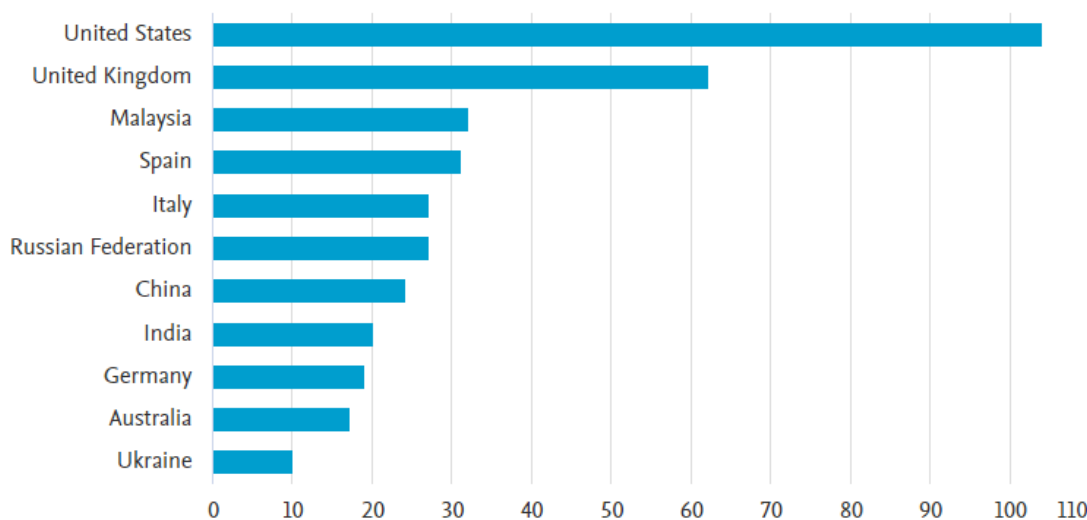


Figure 2. Dynamics of publication activity on the study of banking system concentration
Source: compiled by the authors based on Scopus data.

The above researchers found that countries with higher levels of competition have stricter lending standards in the form of a higher share of rejected mortgage applications. These results suggest that weaker lending standards in states with lower levels of competition were associated with the boom and bust in the housing market. Overall, the study shows that in the United States, greater banking competition is still associated with greater financial stability [3].

Ji Wua, Mengmeng Guob, Minghua Chenb, Bang Nam Jeonc (2019) analysed the impact of banks' market power on their risk-taking and found that there is a significant non-linear relationship between market power and banks' risk-taking. It was found that bank stability increases with market power, but this relationship tends to weaken and even reverse when market power increases above a certain threshold [4].

Rakshit Bijoy, Bardhan Samaresh (2020), having studied the Indian banking system, concluded that there is a need to focus on maintaining an optimal level of banking competition by easing market entry restrictions, reducing consolidation and eliminating overregulation of banking activities. A competitive banking industry ensures both efficiency and stability. A competitive banking sector, by reducing interest margins, facilitates access to finance for both households and small and medium-sized enterprises [5].

Agoraki Maria-Eleni K., Kouretas Georgios P., Triantopoulos Christos (2020) analyse the relationship between democracy, financial regulation, and banking competition in the banking systems of Central and Eastern Europe, i.e. developing countries. The researchers develop new annual non-structural indices of banking competition instead of concentration indices. In addition, using an unbalanced set of panel data for the period, the authors showed that more democratic countries with better regulatory frameworks lead to increased competition [6].

Albaity Mohamed, Mallek Ray Saadaoui, Hassan Al-Tamimi Hussein A., Noman Abu Hanifa Md. (2021) in their work identified a U-shaped relationship between stability and competition in the banking sector of the Gulf countries. It was found that bank concentration has a positive effect on the stability of the entire banking system, which confirms the thesis «banks are too important to fail». In addition, the authors found that Islamic banks are less stable than conventional banks. The paper also found that bank size, profitability and capital regulation increase bank stability. Stock market returns and debt-to-GDP ratios have been shown to increase instability, while rising oil prices increase stability for countries in the region [7].

Pietro Calice, Leone Leonida, Eleonora Muzzupappa (2021) concluded in their research that if concentration is at 50% or below, an increase in concentration improves the stability of the banking sector through profitability. If the concentration is 65% and above, an increase in concentration makes the banking system more vulnerable due to credit risk intermediation effects, diversification, and ease of monitoring [8].

Sukisno Selamat Riadi, Michael Hadjaat, Rizky Yударuddin (2022) noted in their research paper that during COVID-19, high concentration in the banking system led to a decrease in stability, which confirms the concentration-fragility hypothesis. At the same time, the growing problems of a large number of banks prompted them to consolidate in order to increase their capitalisation to avoid bankruptcy. Thus, the authors conclude that capital concentration increases the level of stability of the banking system, which confirms the concentration-stability hypothesis. This conclusion is more pronounced in banks with high capitalisation [9].

Wiyarni W., Ashar Y., Arniati T. (2022), based on an assessment of the issue, concluded that an increase in the level of bank monopolisation increases the level of bank stability, but up to a certain level of bank capital.

Also, banks with high market power tend to set interest rates that are too high, which is why loan portfolios are filled only by high-risk borrowers who are more sensitive to changes in the economy or business cycle. An increase in bank size leads to a decrease in banking stability, which indicates that bank capitalisation should be supported by a banking system with a higher level of competition [10].

Bhuyan P. (2023) in his work explores the problems of consolidation of public sector banks and determines the threshold level of market share that can serve as a benchmark for any future attempts to consolidate banks [11].

Abdurraheem A.A., Alam M.M., Nadzri F.A.A. (2023) focus on the problem of sectoral concentration in the banking sector. The authors draw attention to the existence of a long-term relationship between the concentration of bank funding and credit risks, which was proved using the dynamic OLS cointegration method [12].

As for domestic scholars, it is worth noting that in their work, Sutormina K.M., Sutormina A.M. (2018) - studying the effects of bank capital concentration on economic growth in the state, emphasised that this phenomenon is an objective condition that ensures the banking system's sustainability, efficiency and competitiveness [14].

Balaniuk M.V., Stepanenko S.V. (2020) studied the level of concentration in the banking system of Ukraine and concluded that the growth of the share of assets in state-owned banks had a negative impact on the slowdown in the introduction of technological innovations, as state-owned banks are less flexible [15].

Zherdetska L.V., Kambur M.V. (2021) studied aspects of macroprudential policy and sources of systemic risk. As a result of practical calculations, the researchers came to the conclusion that concentration in the banking system can lead to abuse of market power by banks, and have a negative impact on financial stability and systemic risk in the banking sector [16].

Gasiy O. V., Sokolova A. M., Prokhar N. V. (2021) studied the impact of concentration in the banking system on competition, taking into account regional aspects [17].

Galaziuk N.M., Zelinska O.M. (2021) in their work focus on the fact that the entry of transnational banks into the foreign market becomes a certain stimulating factor for the restructuring of the host country's banking system. This is manifested in an increase in the concentration of bank capital or the creation of a strong competitive environment among local banking institutions. Moreover, very often host countries make a big mistake by implementing too liberal risk policies in order to maximise profits, in which case transnational banks can cause a crisis in the country and thus become a characteristic cause of financial fluctuations that can ultimately lead to inequality in global banking systems [18].

Tchaikovsky Y., Tchaikovska I., Tchaikovsky E. (2022) assessed the level of concentration of the banking system of Ukraine and concluded that the growth of market monopolisation began in 2016

as a result of the transfer of JSC Privatbank to one hundred per cent state ownership. The authors note that these processes have increased the level of stability of the banking system [19].

The results of the evaluation of scientific papers confirm the relevance of the research topic and the significant impact of concentration not only on the stability of the banking and financial system, but also on the development of economies.

RESEARCH RESULTS

The study of concentration issues is impossible without attention to the concept of consolidation. In its economic essence, consolidation is translated from Latin as a union and grouping, so we can talk about a decrease in the number of participants with a simultaneous increase in the volume of the controlled resource base and the amount of capital.

The main prerequisites for mergers include the following: limited resources (primarily financial) to implement innovative solutions; entry into new markets or segments of the economy; increased competition; increased regulatory requirements to improve the financial stability of banks and the system; increased profitability; and risk mitigation.

Exogenous factors, such as financial and political crises and wars, are powerful drivers of consolidation.

The result and a certain marker of consolidation in the banking system is concentration, which in Latin means rivalry and competition. The experience of the development of the domestic and global financial system in general and the banking system in particular shows that the main drivers of bank concentration are competition and regulatory requirements, including capital requirements.

The study of scientific opinion allows us to define bank concentration as the concentration of the main share of the banking services market, and, accordingly, resources, capital, and profits in a smaller number of participants that are the largest in the system.

Considering the issue of capital concentration, one cannot but dwell on the problem of competition, which is a factor of direct influence on the consolidation of resources. On the other hand, monopolisation in the system makes it impossible for fair competition to exist.

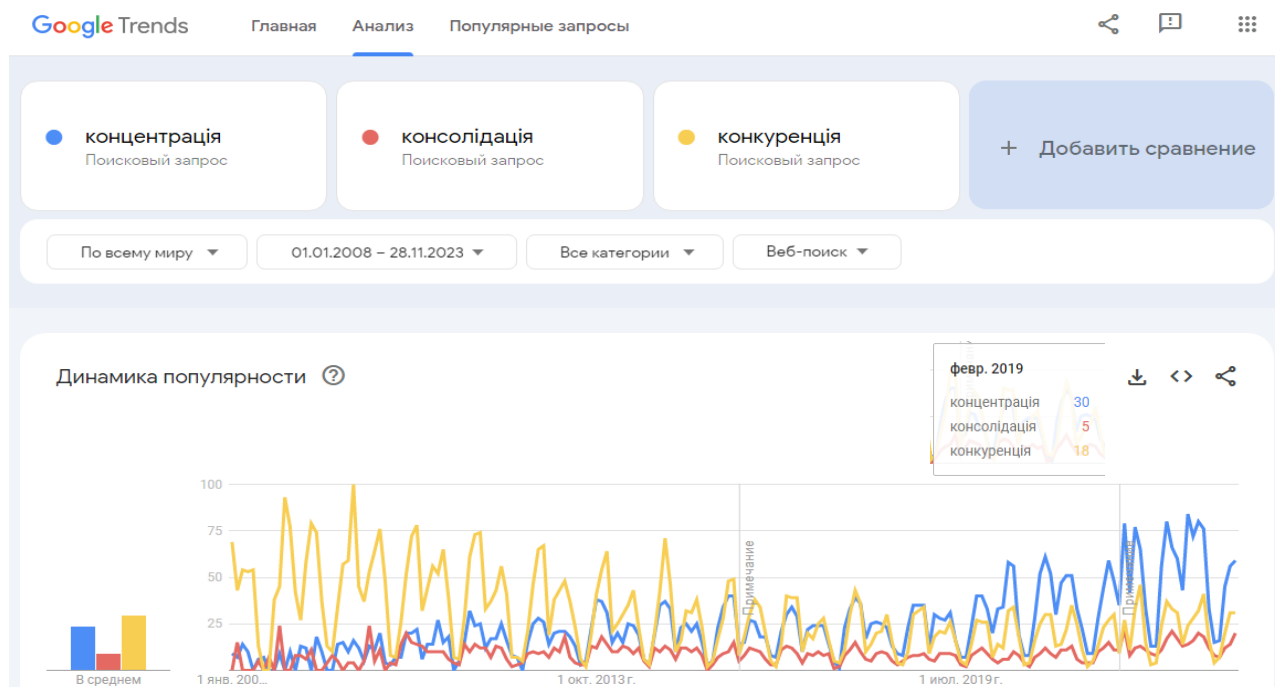


Figure 3. Google Trends query results for the categories «concentration», «consolidation», «competition».

Based on the generalised approaches, it was determined that most systems characterised by stability are subject to the Pareto distribution. According to this distribution, 20% of banks should

concentrate 80% of assets, which actually proves the need for an oligopoly in the banking system. This pattern is commonly referred to in scientific circles as: «Zipf's law of least effort», «Pareto principle», «80/20 ratio». Based on the rank distribution of assets and capital, K. Sutormovna concludes that the optimal number of banks for the effective development of the domestic system should range from 37 to 112 banks [20].

There are two completely opposite concepts in the economic literature: «concentration - stability» and «concentration - instability». Proponents of the concentration-resilience concept believe that unconcentrated banking systems are more vulnerable to crises than concentrated ones. This is because banking systems with a high level of concentration are more resilient to external risks, easier to control by the state and more profitable.

According to the second concept of «concentration-volatility», concentrated banking systems are less stable than unconcentrated ones. This is because large banks can receive subsidies from the state (because they are «big enough to fail») and use such financial assistance to engage in high-risk transactions, thereby reducing the resilience of the banking system. Secondly, an oligopoly or monopoly in the banking market leads to higher interest rates and encourages lending to riskier projects Berger and others [21].

To assess concentration, global economic thought offers a fairly wide range of indicators.

In practice, the most popular among institutions such as the National Bank of Ukraine and the European Central Bank is the assessment of the level of concentration using the Herfindahl-Hirschman Index (HHI; HHI-score; Herfindahl-Hirschman Index) and the Concentration ratio, which reflects the market share of the three CR3, five CR5, ten CR10, and twenty CR20 largest banks.

The concentration index is calculated using the following formula:

$$CR_k = \sum_{i=1}^k S_i \quad (1)$$

where:

CR_k – the concentration index of the k -th number of large economic entities in the market;

k – number of the largest banks (3, 5, 10, 20);

S_i – market shares of the i -th bank (the largest) [21].

The peculiarity of this indicator is that it takes into account the arithmetic sum of the market share of large banks. At the same time, the index does not take into account the distribution of these shares among the market entities used in the calculation.

The Herfindahl-Hirschman index is a measure of bank size in relation to the industry, calculated as the sum of the squared market shares of banks:

$$HHI = \sum_{i=1}^k S_i^2 = \sum \left(\frac{x_i}{\sum x_i} \right)^2 \quad (2)$$

where:

HHI – the Herfindahl-Hirschman index;

k – number of the largest banks (3, 5, 10, 20);

S_i – market share of the i -th bank;

x_i – the value of the i -th bank's indicator [21].

This indicator can be in the form of shares or points and can range from 0 to 1 (or from 0 to 10,000), moving from a large number of participants to a single monopolist. An increase in this index demonstrates a decrease in competition and an increase in market power among a limited number of participants. The Herfindahl-Hirschman index is particularly sensitive to heterogeneity in the distribution of market shares and has low sensitivity to a reduction or increase in the number of banks in a sector with a large number of banks and to the reorganisation of small banks [22]. Thus, if a large number of small banks merge, the index will not change as much as when two large banks combine their capital, which can dramatically increase its value.

Table 1. Regulator's activities according to the degree of system concentration.

Indicator/value	Sign of concentration	Regulator's policy
70% < CR3 < 100 60% < CR5 < 80% 2000 < HHI < 10 000	High degree of concentration	Controlling market pricing, reducing requirements for the standards of participants to increase their number, prohibiting mergers and acquisitions of large banks.
45% < CR3 < 70% 40% < CR5 < 60% 1000 < HHI < 2000	Medium degree of concentration	Monitoring market concentration indicators, encouraging mergers of small banks.
0% < CR3 < 45% 0% < CR5 < 40% HHI ≤ 1000	Low degree of concentration	Monitor market concentration indicators, and if the level of concentration increases, implement measures to improve financial stability and customer confidence in all market participants.

Source: compiled by the author on the basis of [20, 22].

Increased attention to concentration in the financial system by the state of Ukraine is confirmed by attempts to select criteria and implement them in the regulatory field to avoid monopolisation in the banking sector. For the first time, the Resolution of the Board of the National Bank of Ukraine No. 391 dated 18.06.2015 «Comprehensive Programme for the Development of the Financial Sector of Ukraine until 2020» included the Herfindahl-Hirschman Index (HHI) with a value of at least 0.08 (800) in terms of assets in the list of key indicators of the Comprehensive Programme for the Development of the Financial Market of Ukraine [23]. It is worth noting that the Herfindahl-Hirschman Index is recommended by the IMF for calculating financial stability indicators as an indicator of the level of concentration in the banking sector, despite the fact that its first use in 1982 in the United States was to assess the possibility of mergers or acquisitions. It is worth noting that this indicator is the most popular generalised indicator that takes into account both the number of business entities and the inequality of their position in the market [23]. It is noteworthy that the Strategy for 2025 does not focus on the Herfindahl-Hirschman index, but notes the need to reduce the share of state-owned banks in the assets of the banking system from 55.2% as it was in 2020 to 25% by the beginning of 2025 [24]. The full-scale invasion of Ukraine by the Russian Federation in 2022 forced the regulator to review, identify, and in August 2023 declare the highest priority areas for the development of the financial system and macroeconomic environment, declaring them in the new version of the Strategy for the Development of the Financial Sector of Ukraine. And the issue of concentration and reduction of the share of state influence on the banking system is not addressed [24].

The gradual transition from theoretical to practical concentration research was facilitated by the National Bank of Ukraine's policy of reducing the number of banks to cleanse the banking sector of inefficient market participants and to understand the need to create a resilient system to internal and external challenges. The downside of this policy was concentration and, as a result, the state monopolisation of the banking services market.

The analysis of the Herfindahl-Hirschman index based on the data in Figure 4 shows that the Ukrainian banking system is experiencing the third peak moment of concentration growth as of the end of 2022.

It is worth noting that over the 13 years taken for the analysis, the maximum value of the HNI index was recorded in 2013 for retail deposits, which can be explained by the rather large volume of this type of resource accumulated by banks. The value of CR3 index at 72% is noteworthy this year, which indicates the monopoly position of three banks, namely JSC Privatbank, JSC Oschadbank, and JSC Delta Bank (Table 2). This situation should encourage the regulator to pay more attention to the interest rate policy of banks and the use of borrowed capital. In 2015, JSC Delta Bank was declared insolvent, and its owner was accused of withdrawing USD 76.5 million by lending to related companies in Ukraine and then transferring funds abroad under fictitious contracts [26]. A similar

situation occurred in 2016 with JSC Privat Bank, but given its systemic importance and large client base for payroll projects, the NBU decided to nationalise this banking institution.

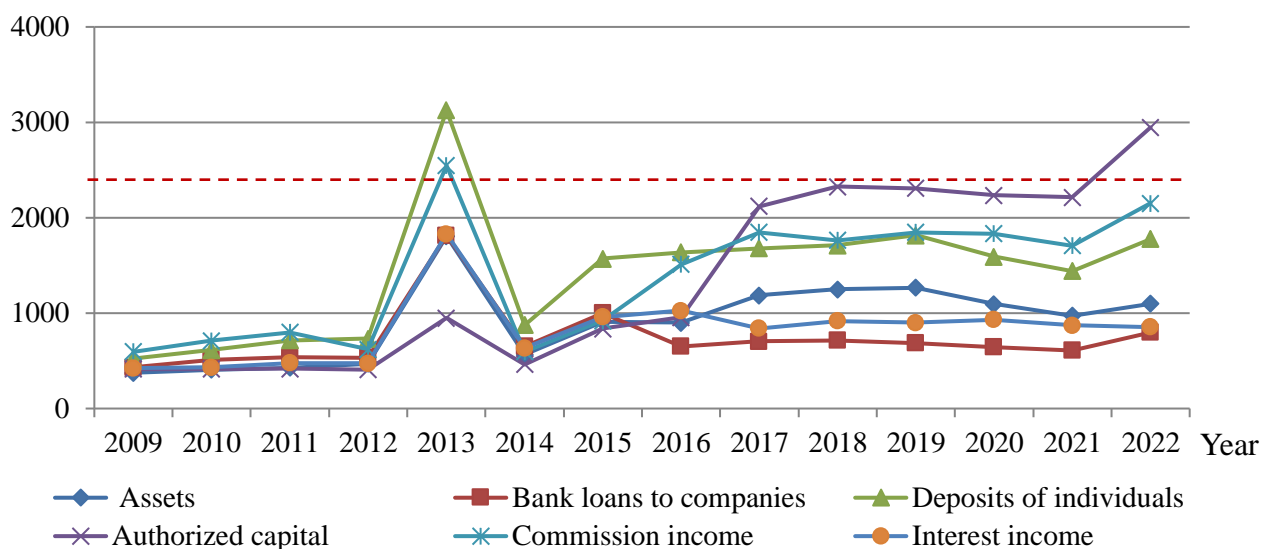


Figure 4. Level of banking sector concentration by HHI in 2009-2022

Source: calculated by the author based on NBU reports [25].

At the same time, the revolution and the outbreak of the war with the Russian Federation had a negative impact on the amount of capital raised by banks in the form of deposits from the public, which led to a significant drop in the NBI index. The aforementioned external factors reduced the concentration index for a number of other indicators: assets, share capital, loans to legal entities, fees and interest income.

Since 2015, the Herfindahl-Hirschman index in terms of retail deposits has been growing, but it has not reached the 2000 level, indicating an average degree of concentration in this indicator. However, the CR5 concentration index indicates a monopoly position of 5 market participants not only in 2013, but also in 2018, 2020-2022 with a value above 60%, which indicates a high degree of concentration and a monopoly position of banks in the retail deposits sector. At the end of 2022, the market was effectively divided between two state-owned banks (JSC CB PrivatBank, JSC Oschadbank), one bank with foreign capital (JSC Raiffeisen Bank), and two banks with private Ukrainian capital (JSC Universal Bank, JSC PUMB).

The dynamics of the index of NRIs by authorised capital deserves special attention. Until 2016, this indicator did not exceed the minimum level of 1,000 points. However, after the nationalisation of Privatbank JSC and the NBU's increased capital requirements for the bank, the state's share in the Ukrainian banking system began to grow significantly in 2017, which eventually led to the Herfindahl-Hirschman index exceeding the 2000 mark, indicating a high level of concentration. The monopolisation of the market by 5 participants is also evidenced by the CR5 index, which had an upward trend and reached its maximum of 131% in 2021 and remains quite high in 2022. This trend is noteworthy because at the end of the analyzed period, three banks in the TOP 5, namely JSC CB PrivatBank, JSC Oschadbank, and JSC Ukreximbank, accounted for 75% of the total authorized capital of all banks. It is worth noting that in 2022, the share of the authorised capital of state-owned banks, the number of which increased from 4 to 5 over the year, also increased by 20% and reached 85% [25, 26].

At the same time, the NBI and CR3 asset indices have been at a low and medium level of concentration during the analysed period. At the same time, CR5 assets have tended to be highly concentrated since 2017.

As a result, the Herfindahl-Hirschman index for loans to legal entities demonstrates a low degree of concentration throughout the analysed period. At the same time, the CR3 and CR5 indices also demonstrate a similar level, with the exception of 2013 and 2021, demonstrating the existence of a

monopoly in this market segment, with the share of banks with foreign capital amounting to 40% and state-owned 35% in 2021.

In terms of income, the NII index has a low degree of concentration in terms of interest income, with the exception of 2013. But the CR3 and CR5 indices show a high degree of concentration in 2021. At the same time, according to the Herfindahl-Hirschman index, fee and commission income was within the medium degree of concentration, except for 2013 and 2022. The CR3 and CR5 concentration indicators of fee and commission income were also at low and medium levels, with the exception of 2013 for CR5. At the same time, it is worth noting that despite the above indicators, in 2022 the share of fee and commission income earned by state-owned banks was 64%.

Table 2. Dynamics of the concentration index of three and five banking institutions in Ukraine for the period from 2009 to 2022, (%).

Year	Assets		Bank loans to companies		Deposits of individuals		Authorized capital		Commission income		Interest income	
	(CR3)	(CR5)	(CR3)	(CR5)	(CR3)	(CR5)	(CR3)	(CR5)	(CR3)	(CR5)	(CR3)	(CR5)
2009	23	35	29	37	27	41	27	33	29	41	24	37
2010	26	37	32	38	32	42	25	32	33	46	26	38
2011	28	37	33	40	35	43	26	28	34	46	29	39
2012	31	39	33	41	36	42	27	31	28	38	30	39
2013	60	75	58	69	72	91	41	45	51	94	61	75
2014	35	43	35	44	39	47	30	36	24	39	36	44
2015	28	28	22	22	23	23	33	34	15	15	26	26
2016	48	52	34	38	57	60	39	44	48	50	49	53
2017	54	63	31	45	58	66	59	63	51	64	44	55
2018	55	60	31	40	59	63	63	66	51	53	44	50
2019	54	60	30	39	53	56	63	66	52	54	42	49
2020	49	56	26	36	56	60	63	66	52	54	42	49
2021	44	100	28	71	52	111	63	131	50	105	41	92
2022	47	60	35	51	57	65	75	85	57	64	39	49
Growth Rate Indicators												
2010	12	6	11	4	15	5	-6	-4	13	11	6	2
2011	7	-1	4	4	11	2	4	-10	4	0	12	4
2012	10	5	-2	2	1	-3	3	10	-17	-17	3	0
2013	96	94	78	69	103	116	53	44	80	147	104	93
2014	-42	-42	-39	-37	-46	-48	-27	-19	-53	-58	-40	-42
2015	-20	-35	-39	-51	-42	-51	13	-8	-38	-62	-29	-41
2016	70	84	55	75	152	166	18	31	221	231	89	105
2017	14	21	-8	19	2	10	50	43	7	28	-9	5
2018	2	-4	0	-11	1	-5	7	5	0	-16	0	-9
2019	-2	1	-4	-4	-9	-11	-1	-1	2	2	-5	-3
2020	-9	-7	-12	-6	5	7	0	0	0	0	0	0
2021	-10	78	6	95	-7	85	0	99	-4	93	-2	90
2022	6	-40	26	-28	11	-41	19	-35	14	-39	-4	-47

Source: Authors' calculations based on NBU reports

This trend should encourage the NBU to reduce the state's share in the banking system, but it is a mistake to privatise such banks as PrivatBank, whose fee and commission income in the structure of the entire market is 43%, and Oschadbank, whose fee and commission income is 12%.

The dynamics of the CR3 and CR5 rates demonstrates two periods of rather sharp growth of concentration in the system: 2013 and 2016, as well as a significant increase in CR5 in 2021, and a yield of this indicator in favour of CR3 in 2022.

Focusing on the first year of the full-scale war between Russia and Ukraine, it is worth noting that the market power of the three leading banks is growing, but in accordance with the regulatory values of CR3, the vast majority of indicators show an average degree of concentration (Table 1). A positive signal at the end of the analysed period is a decrease in the growth rate of CR5 indicators, but their value indicates a high degree of concentration in the banking system.

CONCLUSIONS

When assessing the degree of concentration in the Ukrainian banking system, it is worth noting that several stages of increasing concentration can be identified during the analysed period. After the crisis of 2008, the banking sector participants gradually accumulated their own potential, reaching its peak in 2013, as evidenced by the indicators calculated in this paper. Russia's military aggression in 2014 resulted in the loss of territories and a part of the real, financial sector of the economy; in the same year, the NBU launched a policy of cleansing the banking system of banks unstable to the crisis and nationalising a systemic bank, which eventually led to a significant increase in market concentration in 2017, due to an increase in the share of state-owned banks. The full-scale invasion of Russia in 2022 had a mixed impact on market concentration, which can be explained by the growing role of the three leaders in the system, but the degree of influence of other players decreased. The data obtained gives grounds to assert the existence of a state monopoly in the market

Undoubtedly, the concentration of market power by state-owned banks is highly relevant and requires a reduction in the state's share, due to the risk of inefficient decisions. At the same time, it is worth noting that the situation in the system as of 2022 had a rather positive impact on the state's ability to attract financial resources to finance military operations and its ability to influence inflationary processes.

REFERENCES

1. Beck, T, Demirgüç-Kunt, A., , Levine, R. (2006) Bank concentration, competition, and crises: First results. *Journal of Banking & Finance*, 30 (5), 1581–1603. https://www.researchgate.net/publication/4965031_Bank_concentration_competition_and_crises_First_results
2. Amidu, M. (2013) Does Bank Competition and Diversification Lead to Greater Stability? Evidence from Emerging Markets. *Review of Development Finance*, 3, 152 – 166. doi:10.1016/j.rdf.2013.08.002
3. Akins, B., Li, L., Ng, J., Rusticus, T. (2016) Bank Competition and Financial Stability: Evidence from the Financial Crisis. *Journal Of Financial and Quantitative Analysis*, 1, 1–28. doi:10.1017/S0022109016000090
4. Wua, J., Guob, M., Chenb, M., Jeonc, B. (2019) Market power and risk-taking of banks: Some semiparametric evidence from emerging economies. *Emerging Markets Review*, 41, 1–21. doi: 10.1016/j.ememar.2019.100630
5. Bijoy, R., Samaresh, B. (2020) Bank competition in India: revisiting the application of Panzar–Rosse model. *Managerial Finance*, 46 (11), 1455 – 1477. doi:10.1108/MF-09-2019-0457
6. Agoraki, M., Kouretas, G., Triantopoulos, Ch. (2020) Democracy, regulation and competition in emerging banking systems. *Economic Modelling*, (84), 190 – 202. doi: 10.1016/j.econmod.2019.04.009
7. Mohamed, A., Ray Saadaoui, M., Hassan Al-Tamimi, H., Md. Noman, A. (2021) Does competition lead to financial stability or financial fragility for Islamic and conventional banks?

Evidence from the GCC countries. *International Journal of Finance and Economics*, 3, 4706 – 4722. doi: 10.1002/ijfe.2037

8. Calice, P., Leonida, L., Muzzupappa, E. (2021) Concentration–stability vs concentration–fragility. New cross–country evidence. *Journal of International Financial Markets, Institutions and Money*, 74. doi: 10.1016/j.intfin.2021.101411

9. Selamat Riadi, S., Hadjaat, M. (2022) Rizky Yudaruddin Bank Concentration and Bank Stability during the COVID–19 Pandemic. *Emerging Science Journal*, 6, 262–274. doi:10.28991/esj–2022–SPER–018

10. Wiyarni, W., Ashar, Y. and Arniati, T. (2022) Competitiveness and Bank Stability: Empirical Study on Banking Listed on the Indonesia Stock Exchange Period 2011–2020. *American Journal of Industrial and Business Management*, 12, 1088–1104 doi: 10.4236/ajibm.2022.126058 .<https://www.scirp.org/journal/paperinformation?paperid=117827>

11. Bhuyan, P. (2023) Concentration, Competition and Soundness of the Banking System in India. *Economic and Political Weekly*, 58(49), 56–63. <https://www.epw.in/journal/2023/49/special-articles/concentration-competition-and-soundness-%C2%A0-banking.html>.

12. Abdurraheem, A.A., Alam, M.M., Nadzri, F.A.A. (2023) Financing Concentration and Credit Risks: Empirical Study on the Islamic Banks in Malaysia *Management and Accounting Review*, 22(3), 465–489. <https://www.epw.in/journal/2023/49/special-articles/concentration-competition-and-soundness-%C2%A0-banking.html>

13. Ghossoub, E.A. (2023) Economic growth, inflation, and banking sector competition. *Economic Modelling*, 129. doi: 10.1016/j.econmod.2023.106528

14. Sutormina, K.M., Sutormina, A.M. Trends in the manifestation of concentration processes in the banking sector of Ukraine. Modernisation of the financial and credit system: materials of the All-Ukrainian scientific and practical conference (pp. 32-35). 27 March, 2018, Kyiv, Ukraine: Kyiv National University of Trade and Economics.

15. Balaniuk, M.V., Stepanenko, S.V. (2020) Concentration of banking activity in Ukraine. *Ukrainian Journal of Applied Economics*, 5(2), 33-39.

16. Zherdetska, L.V., Kambur, M.V. (2021) Macropprudential analysis of the banking sector of the Ukrainian economy. *Scientific Bulletin of Odesa National Economic University*, 5(6), 282-283.

17. Gasiy, O. V., Sokolova, A. M., Prokhar, N. V. (2021) Factors of the competitive environment in the banking sector of Ukraine: a regional aspect. *Effective Economy*, 5. doi: 10.32702/2307-2105-2021.5.85

18. Galaziuk, N. M., Zelinska, O. M. (2021) Modern trends in the activities of transnational banks and their impact on the world economy in the context of financial globalisation. *Economic Forum*, 4, 42-48. DOI: <https://doi.org/10.36910/6775-2308-8559-2021-4-6>

19. Tchaikovsky, Y., Tchaikovsky, I., Tchaikovsky, E. (2022) Efficiency of banking institutions in Ukraine. *World of Finance*, (3), 127-140. doi: 10.35774/sf2022.03.127 UDC 336.717

20. Sutormina, K. M. (2018) Regulation of concentration processes in the banking system of Ukraine. *Finance, accounting, audit*, (2), 221-234.

21. Gasyuk, M.O. (2016) Estimation of the indices of concentration of the banking system of Ukraine. *Socio-economic problems of the modern period of Ukraine*, (2), 99-104.

22. Okrepkyi, R.B., Myhal, O.F. (2016) Methodological aspects of using quantitative indicators of commodity market concentration and the degree of its monopolisation. *Ukrainian Journal of Applied Economics*, (4), 81-88.

23. Comprehensive Programme for the Development of the Financial Sector of Ukraine until 2020 (NBU Resolution). №391. (2015). Retrieved from <https://zakon.rada.gov.ua/laws/show/v0391500-15#Text>

24. Strategy for the Development of the Financial Sector of Ukraine until 2025. (2023) Retrieved from <https://bank.gov.ua/ua/about/develop-strategy/develop-strategy2023>

25. Official website of the National Bank of Ukraine. (2023) Retrieved from <https://bank.gov.ua/>.

26. Overview of the banking sector. February. 2022. (2023) Retrieved from https://bank.gov.ua/admin_uploads/article/Banking_Sector_Review_2022-02.pdf?v=4.