Roman Piskunov
PhD of Economics, Associate Professor,
Head of the Department of Accounting and Taxation,
Education and Research Institute "Karazin Banking Institute"
of V.N. Karazin Kharkiv National University,
Maidan Svoboda, 4, Kharkiv, 61022, Ukraine
e-mail: a.piskunov@karazin.ua;
ORCID ID: 0000-0001-6133-9233

Olena Moskalenko
PhD of Economics, Associate Professor,
Education and Research Institute "Karazin Banking Institute"
of V.N. Karazin Kharkiv National University,
Maidan Svoboda, 4, Kharkiv, 61022, Ukraine
e-mail: o.v.moskalenko@karazin.ua;
ORCID ID: 0000-0001-9840-2347

Victoria Krill
Leading loan specialist
JSC OTP BANK, Kyiv, Ukraine
e-mail: poltavec.viktoriya@gmail.com

ANALYTICAL SUPPPORT FOR BANK LOAN TRANSACTIONS

Abstract. The article emphasizes the importance of analytics in the effective organization of bank loan operations. The purpose of the article is to determine the range of problems currently faced by analysts of loan departments of Ukrainian banks, highlighting urgent issues related to the economic crisis caused by the war, and to outline ways to solve them using the latest and modern methods.

The article proves that the organization of effective analytical support of loan transactions is extremely important both for the bank and its borrowers, and for the state as a whole. However, there are a number of problems that prevent its effective development. Among the main ones, there are such issues as processing a large number of arrays of data on customers and their financial transactions as well as the low quality of such data; structuring of data from separate isolated databases, which complicates the process of their analysis and processing; need for complying with regulatory requirements and standards; deterioration in the quality of analytics due to the increased speed of response to requests for loan, etc.

The article reveals the problems of analytical support for bank loan operations, which become relevant during the law and the economic crisis. These are an increase in the risk of loan defaults, excessive regulatory intervention, changes in market conditions and technologies, a decrease in the liquidity of the banking system, insufficient information about the client, excessive reliance on "historical" data and the rise of fraud.

The study proposes means of solving the outlined problems, the general directions of which are risk-orientation, interaction with clients, internal communications and technology development. Attention is focused on the need for banks to improve their analytical tools using the latest technologies, such as machine learning and artificial intelligence, blockchain technologies, tools for real-time analytics, Big Data technologies, analytical robots and dashboards. The use of the specified methods will allow banks to organize proper analytical support for loan operations and will enable effective management decisions to be made quickly.

Keywords: *loan transactions, analytical support, credit risk, credit portfolio, analytical data.*
JEL Classification: G 21
Formulas: 0; fig.: 1, tab.: 0, bibl.: 10.

Introduction. Providing loan transaction analytics is becoming an increasingly important task for banks due to the growth of the number of loan transactions, risks and regulatory requirements. However, despite the high relevance of this field, there are a number of problems that prevent its effective development. Timely identification and localization of certain obstacles will allow banks to provide effective analytical support for loan transactions in order to increase the efficiency of their own activities.

Analysis of recent research and purpose of the research. Prominent Ukrainian and foreign scholars, including V. Mishchenko, V. Rysin, G. Karcheva, I. Semencha, T. Bolgar and many others, were engaged in the study of the research subject under consideration. However, taking into account the special present conditions, banks are facing new challenges to which they need to quickly adapt.

Thus, the purpose of the article is to determine the range of problems currently faced by analysts of loan departments of Ukrainian banks, highlighting urgent issues related to the economic crisis caused by the war, and to outline ways to solve them, using the latest and modern methods.

Research results. Given the dynamism of the modern environment, the problem of data processing today is one of the main ones. In today's world, banks can receive large amounts of data about customers and their financial transactions, which requires significant computing resources. The latter may be an issue for some banks. Analysts should provide quick and efficient analysis of this data to make informed decisions related to lending.

However, banks sometimes do not have enough data about particular customers, which makes assessing their creditworthiness diffucult. Third-party databases and other sources can be used to solve this problem.

In addition to the quantity, the quality of data is also important: low-quality data about customers and their financial condition often can lead to incorrect analysis and issuance of loans [1]. This problem can be solved by methodological and technological improvement of the data collection and verification process.

But analyzing a large amount of data requires not only a powerful technical infrastructure, but also competent specialists who can work with such tools as machine learning, artificial intelligence and analytical systems. Many banks rely on old, outdated systems that complicate the process of analyzing and securing data [2]. Low automation and a manual approach lead to delays and errors in the process of assessment and decision-making regarding the provision of loans.

Another problem related to data is its structuring. Most of the data about customers and their financial condition are located in separate, isolated databases, which complicates the process of analysis and processing. This problem can be solved by developing a unified information resource.

The lack of standardization, general requirements for data description, methods of analysis and reporting can make it difficult to assess loan risk assessment. To solve this problem, banks should set common internal standards and procedures for risk assessment [3].

At the same time, the variety of services provided by banks, the variety of modern loan products available increasingly demand an individual approach. And this complicates the process of creating a common analytical tool for all products and services.

There is another important nuance in course of analytical work with loan data which is regulatory requirements and standards on lending and protection of confidential customer information. Analytical support for the bank's loan transaction must meet these requirements and ensure a high level of data security. At the same time, it is a common knowledge that compliance with legislative norms and rules related to lending often becomes a problem for high-quality analytics [4].

One of the challenges for banks is growing competition. Banks have to constantly improve the accuracy of analytics: depending on the complexity of loan products, forecasting the respective credit risk can be quite difficult and inaccurate. Competition is also driving the speed of decision-

making: banks have to respond quickly to lending requests, which becomes a challenge for analytical support, which can be slow or delayed.

During the martial law and economic crisis, the problems of analytical support of the bank's loan transactions are becoming especially relevant. The main challenges that banks may face in providing loans include:

1. Increased risk of loan defaults.

Below is a chart showing the dynamics of loan transactions in Ukraine before the war and in the period from 2014 to 2021 according to the statistics portal of the National Bank of Ukraine (Fig. 1).

The table shows that in the period from 2010 to 2013, the volume of loans in Ukraine grew. However, in 2014, after the beginning of the conflict in eastern Ukraine, the volume of loans decreased. The recovery of the credit market began in 2015, but the level of outstanding loans increased. Since 2017, the volume of loans began to grow and reached its peak in 2021. At the same time, the share of overdue loans decreased and amounted to 3.5% in 2021.

This data demonstrates that the credit market in Ukraine has a certain stability and can grow despite the difficult economic and political situation in the country. It is also important to note that the decrease in the level of overdue loans indicates that banks have become more cautious when issuing loans and conducting credit screening, which can positively affect the stability of the credit market.
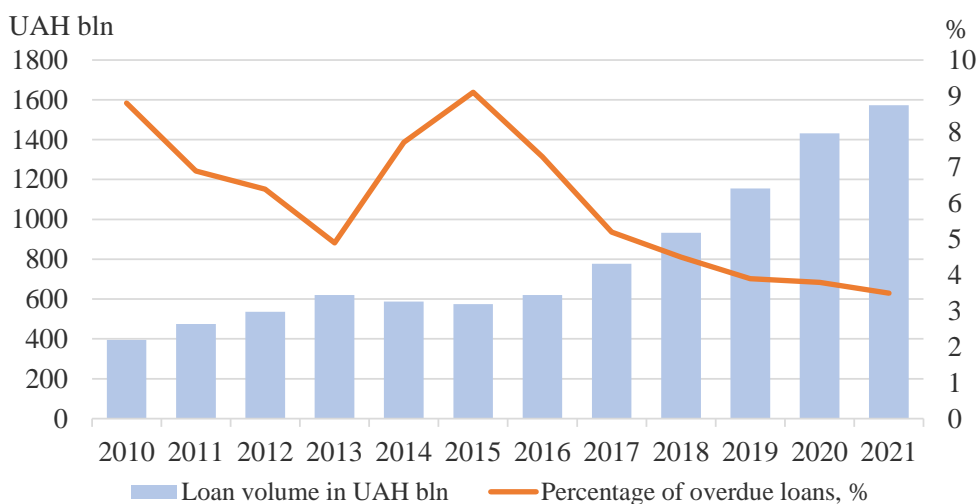

Fig. 1. Dynamics of the volume of loan transactions in Ukraine in 2010–2021.
Source: prepared by the authors on the basis of [5].

However, during recessions and martial law, lending risk increases due to economic and political instability. This can lead to an increase in the number of insolvent debtors and an increase in the amount of outstanding loans, as it was worldwide during the COVID-19 crisis [6]. Banks should quickly and accurately assess the risk of non-payment and make appropriate decisions on granting loans. This requires the use of more complex analytical tools and models for risk assessment.

2. Excessive regulatory intervention [7]. During the martial law, state regulators may change their requirements and excessively interfere with banks. This may create additional difficulties for banks and require additional analytical efforts to adapt accordingly.

3. Change in market conditions and technologies. During the economic crisis or recession, market conditions and technologies may change, which may require banks to quickly adapt and employ new analytical tools and approaches [8]. As a result, banks may have to change their loan requirements and reduce liquidity, which demands modification of their approach and a reassessment of their models.

4. Decrease in the liquidity of the banking system. It is caused by a decrease in the number of deposits, restrictions on the export of capital, an increase in credit risks and by other factors. This causes a decrease in the efficiency of analytical support of loan transactions, as banks are forced to refuse lending, to take more strict measures in granting loans and reduce loan limits. We could observe that last year.

The first two quarters of 2022 were the most shocking for the banking system. However, in the second quarter of 2022, the banking sector quickly adapted to work under the martial law. The hryvnia credit portfolio increased thanks to corporate lending by state banks.

Despite the martial law, the level of liquidity remained high. The volume of loan funds in banks increased first of all due to hryvnia funds of the population and business deposits in foreign currency.

Banks' net assets increased by 3.3% in the second quarter of 2022 and almost recovered to the pre-war level.

Net hryvnia corporate loans increased by 5.3% during the quarter, while foreign currency corporate loans decreased by 7.2% in dollar equivalent.

The growth of hryvnia corporate lending became possible due to the activity of state-owned banks, which increased their activity by 30% during the quarter.

The net retail loan portfolio decreased by 11.1% in the second quarter, which was caused by a decrease in the volume of lending, as well as increased reserves.

The volume of non-performing loans began to grow for the first time in a long period: their share increased by 2.6 percentage points to 29.7% in the second quarter of 2022. The net assets of banks increased by 7.5% in the third quarter and exceeded the pre-war indicators. It was mainly the the volume of NBU deposit certificates that increased.

In the third quarter of 2022, there was a decrease in net hryvnia corporate loans by 2.2%, and foreign currency loans by 10.0% in dollar equivalent.

Only state banks increased the volume of hryvnia lending to businesses by 4.3% over the quarter. The net retail loan portfolio shrank by 13.8% in the third quarter as a result of lower lending due to growth of reserves.

The share of non-performing loans increased by 3.9% for the quarter and by 7.0% since the beginning of the full-scale invasion in total, having reached 33.6% [9].

5. Insufficient information about clients. During the economic crisis and recession, the financial circumstances of clients can change. Moreover, they may change very quickly in the mode of force majeure. And, as a result, banks will not have enough up-to-date information to make decisions on granting loans.

6. Excessive dependence on "historical" data. In the conditions of insufficiency of new data, banks may become excessively dependent on outdated data when analyzing default risk. This can lead to incorrect risk assessments and wrong decisions on granting loans.

7. The growth of fraud is a tradiotional problem of troubled times. In times of crisis, the number of fraudsters and fraudulent schemes increases many times, which can lead to an increase in the risk for banks [10]. Banks should quickly expose them, as well as apply modern technologies and analytical tools to prevent fraud and protect customers from financial crimes. This is due to the fact that modern criminals actively use the latest technologies for financial frauds. There is also a possibility of an increase in cyber-attacks, which may lead to the theft of confidential information about customers and bank accounts.

Conclusions. In the current circumstances the following can be recommended to the banks to solve the above-mentioned problems:

Risk-orientation: banks should develop and implement analytical tools to assess lending risk and determine optimal loan terms for clients with different financial profiles.

Customer interaction: banks should ensure effective communication with customers and provide them with information about their loan transactions. Analysts should develop and implement tools for analyzing customer behavior and identifying their need for loans.

Internal communication: banks should maintain effective communication between departments and employees to ensure proper control and coordination of activities. This approach will allow banks to quickly respond to changes in the economic and political situation and make the right decisions in difficult conditions.

Technology development: in the 21st century, it is one of the most promising directions. Banks can improve their analytical tools by applying the following latest technologies of the modern world:

1. Machine learning and artificial intelligence. The application of these technologies allows in the future to almost completely automate the loan risk assessment and increase the efficiency of decision-making.

2. Blockchain technologies. Their use makes it possible to store and process data more safely and efficiently, avoiding possible data processing errors.

3. Big Data. Its application allows banks to analyze large data sets, obtaining information that may be important for decision-making.

4. Real-time analytics tools. They enable banks to receive information about credit risk instantly, which makes it possible to make decisions faster and more efficiently.

5. Robotic analysts. These are software robots that can automate the process of analyzing data and preparing reports, which helps to improve the productivity and accuracy of analytical support.

In addition, banks can use various types of analytical reports and dashboards to monitor the financial condition of clients and ensure proper risk control. Dashboards can display key indicators such as liquidity and credit risk indicators, which will help banks make timely decisions.

One of the ways to deal with the analytical support of credit operations during the martial law is to provide staff with proper training so that employees can work effectively under stress and emergencies. It is also important to develop detailed action plans in case of crisis situations and relevant documentation, including analytical, to quickly respond to unforeseen circumstances.

Список використаної літератури

1. Зоря О. П. Облік та аналіз кредитних операцій банку. *Ефективна економіка*. 2017. №10. С. 78-81.
2. Волкова В. В., Волкова Н. І., Ставська К. А. Концепція вдосконалення оцінки якості кредитного портфеля в управлінні кредитною діяльністю банку. *Економіка і організація управління*. 2021. № 1. С. 30–40. URL: https://doi.org/10.31558/2307-2318.2021.1.3 (дата звернення: 15.04.2023).
3. Rudhani, L., Balaj, D.: Management of Liquidity Risk and the Banking Activity. International Journal of Finance & Banking Studies 8(2), 01-08 (2019). doi:10.20525/ijfbs.v8i2.29
4. Зверук Л. А., Лисенко Т. С. Управління кредитною діяльністю банківських установ: сутність, практика, напрями вдосконалення. *Бізнес Інформ*. 2019. №1. С. 349-357.
5. Статистика фінансового сектору. Національний банк України. URL: https://bank.gov.ua/ua/statistic/sector-financial#1ms (дата звернення: 15.04.2023).
6. Aldasoro, I., Fender, I., Hardy, B., Tarashev, N. Effects of Covid-19 on the banking sector: the market's assessment. *BIS Bulletin*. 2020. 12. URL: https://www.bis.org/publ/bisbull12.pdf (2020). (дата звернення: 15.04.2023)
7. Крот Л. М., Шаповал Л. П., Фугело П. М. Макропруденційне управління проблемними активами банківських установ. *Подільський вісник: сільське господарство, техніка, економіка*. 2023. № 33. С. 104-114. URL: https://doi.org/10.37406/2706-9052-2020-2-12 (дата звернення: 15.04.2023).
8. Семенча І. Ефективне управління кредитною діяльністю банку: системний погляд професійного менеджера. *Інфраструктура ринку*. 2019. № 34. С. 291-297. URL: https://doi.org/10.32843/infrastruct34-42 (дата звернення: 15.04.2023)
9. Звіт про фінансову стабільність НБУ. URL: https://bank.gov.ua/admin_uploads/article/FSR_2022-H2.pdf?v=4 (дата звернення: 15.04.2023)
10. Криклій О. А. Теорія та практика забезпечення кіберстійкості банків. *Ефективна економіка*. 2020. № 10. URL: http://www.economy.nayka.com.ua/pdf/10_2020/52.pdf. DOI: 10.32702/2307-2105-2020.10.50 (дата звернення: 15.04.2023).

References

1. Zoria, O. (2017). Oblik ta analiz kredytnykh operatsii banku. [Accounting and analysis of bank credit transactions]. *Efektyvna ekonomika*. Vol. 10, 78-81 [in Ukrainian].
2. Volkova, V., Volkova, N., Stavska, K. (2021). Kontseptsiia vdoskonalennia otsinky yakosti kredytnoho portfelia v upravlinni kredytnoiu diialnistiu banku. [The concept of improving the assessment of the quality of the credit portfolio in the management of the bank's credit activity]. *Ekonomika i orhanizatsiia upravlinnia*. Vol. 1, 30-40. Retrieved from https://doi.org/10.31558/2307-2318.2021.1.3. [in Ukrainian].
3. Rudhani, L., Balaj, D. (2019). Management of Liquidity Risk and the Banking Activity. *International Journal of Finance & Banking Studies*. 8(2), doi:10.20525/ijfbs.v8i2.29. [in English].
4. Zveruk, L., Lysenko, T. (2019). Upravlinnia kredytnoiu diialnistiu bankivskykh ustanov: sutnist, praktyka, napriamy vdoskonalennia. [Management of credit activity of banking institutions: essence, practice, areas of improvement.]. *Biznes Inform*. Vol. 1, 349-357/ [in Ukrainian].
5. Official website of the NBU. (2023). *Statystyka finansovoho sektoru.* [Statistics of the financial sector]. Retrieved from https://bank.gov.ua/ua/statistic/sector-financial#1ms. [in Ukrainian].
6. Aldasoro, I., Fender, I., Hardy, B., Tarashev, N. (2020). Effects of Covid-19 on the banking sector: the market's assessment. *BIS Bulletin*. Vol. 12. Retrieved from https://www.bis.org/publ/bisbull12.pdf. [in English].
7. Krot, L., Shapoval, L., Fuhelo, P. (2023). Makroprudentsiine upravlinnia problemnymy aktyvamy bankivskykh ustanov. [Macroprudential management of problematic assets of banking institutions]. *Podilskyi visnyk: silske hospodarstvo, tekhnika, ekonomika.* Vol. 33. 104-114. Retrieved from https://doi.org/10.37406/2706-9052-2020-2-12. [in Ukrainian].
8. Semencha, I. (2019). Efektyvne upravlinnia kredytnoiu diialnistiu banku: systemnyi pohliad profesiinoho menedzhera. [Effective management of the bank's credit activity: a systemic view of a professional manager]. *Infrastruktura rynku.* Vol. 34. 291-297. Retrieved from https://doi.org/10.32843/infrastruct34-42 [in Ukrainian].
9. Official website of the NBU. (2023). *Zvit pro finansovu stabilnist NBU.* [Report on the financial stability of the NBU]. Retrieved from https://bank.gov.ua/admin_uploads/article/FSR_2022-H2.pdf?v=4. [in Ukrainian].
10. Kryklii, O. (2020). Teoriia ta praktyka zabezpechennia kiberstiikosti bankiv. [Theory and practice of ensuring cyber resilience of banks]. *Efektyvna ekonomika.* Vol. 10. Retrieved from: http://www.economy.nayka.com.ua/pdf/10_2020/52.pdf. [in Ukrainian].

Роман Піскунов
к.е.н., доцент, завідувач кафедри обліку та оподаткування,
Навчально-науковий інститут «Каразінський банківський інститут»
Харківського національного університету імені В.Н. Каразіна,
майдан Свободи,4, Харків, 61022, Україна
e-mail:r.a.piskunov@karazin.ua; ORCID ID: 0000-0001-6133-9233
Олена Москаленко
к.е.н., доцент,
Навчально-науковий інститут «Каразінський банківський інститут»
Харківського національного університету імені В.Н. Каразіна,
майдан Свободи,4, Харків, 61022, Україна
e-mail:o.v.moskalenko@karazin.ua; ORCID ID: 0000-0001-9840-2347
Вікторія Кріль
Провідний фахівець з кредитування АТ "ОТП БАНК", Київ, Україна
e-mail: poltavec.viktoriya@gmail.com

АКТУАЛЬНІ ПРОБЛЕМИ АНАЛІТИЧНОГО ЗАБЕЗПЕЧЕННЯ КРЕДИТНИХ ОПЕРАЦІЙ БАНКУ

Анотація. Стаття актуалізує важливість аналітики в ефективній організації кредитних операцій банку. Метою статі є визначення кола проблем, з якими зараз стикаються аналітики кредитних відділів українських банків, виокремивши нагальні питання, пов'язані з викликаною війною економічною кризою, і намітити шляхи їх вирішення, застосовуючи у тому числі новітні та сучасні методики.

В статті доведено, що організація ефективного аналітичного забезпечення кредитних операцій має надзвичайно важливе значення як для банку та його позичальників, так і для держави в цілому. Проте існує певна низка проблем, що стримують його ефективний розвиток. Серед основних виділені такі, як проблема обробки великої кількості масивів даних про клієнтів та їхні фінансові операції та низка якість таких даних; структурування даних з відокремлених ізольованих баз, що ускладнює процес їх аналізу та обробки; складність дотримання регуляторних вимог та стандартів; погіршення якості аналітики через збільшення швидкості реагування на запити про кредитування тощо.

В статті розкрито проблеми аналітичного забезпечення кредитних операцій банку, які набувають актуальності під час воєнного стану та економічної кризи, а саме: збільшення ризику невиплат кредитів, надмірне регуляторне втручання, зміна ринкових умов та технологій, зниження ліквідності банківської системи, недостатня інформація про клієнта, надмірна залежність від «історичних» даних та зростання шахрайства.

В роботі запропоновані засоби вирішення означених проблем, загальними напрямками яких є ризик-орієнтованість, взаємодія з клієнтами, внутрішні комунікації та розвиток технологій. Акцентовано увагу на необхідності вдосконалення банками свої аналітичних інструментів із використанням новітніх технологій, таких як машинне навчання та штучний інтелект, блокчейн-технології, засоби для аналітики в режимі реального часу, технологій Big Data, програмні роботи-аналітики та дашборди. Використання зазначених методів дозволить банкам організувати належне аналітичне забезпечення кредитних операцій та дасть змогу оперативно приймати ефективні управлінські рішення.

Ключові слова: кредитні операції, аналітичне забезпечення, кредитний ризик, кредитний портфель, аналітичні дані.

Формули: 0; рис.: 1, табл.: 0, бібл.: 10.