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DIGITALIZATION MANAGEMENT IN THE CORPORATE BANKING SECTOR OF UKRAINE

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Introduction. Digitalization in trendy banking services requires changing their relationships with corporate clients within the framework of an individual approach to each client in the context of the development of the latest information and communication technologies and Internet marketing. Therefore, improving the business customer service system based on innovative technologies in banks to increase their competitiveness and profitability remains relevant.

Aim and tasks. This study aims to examine the trends in banks' service of corporate clients in the context of the latest financial technology development and to determine the directions for forming a digitalization strategy in corporate banking in Ukraine.

Results. The growth of corporate clients in the banking system of Ukraine in 2022-2024 became possible due to the digitalization of management and the implementation of electronic payment systems, which contributed to the growth in the number of open accounts, which increased by 27%, while the growth of remote servicing increased from 78% to 89% of business clients. The top 10 banks in Ukraine account for 75% of the funds in corporate clients' accounts. Along with high reliability, the clients of these banks have come to value the digital services that banks provide that meet global standards. As a result of the growth in the volume of banking services provided to corporate clients in 2023 using digital technologies, the volume of fee and commission income of the Ukrainian banking system increased by 13% compared to 2022.

Conclusions. The banking system of Ukraine is in the process of digital transformation that promotes the transformation of financial institutions into high-tech platforms capable of creating new algorithms for generating profit from digital technologies. Implementing digital transformation in the banking sector increases the number of banks' corporate clients and their satisfaction with banking products and services. This leads to an increase in the efficiency of banking activities and banks' profitability through increased commission income. The forecasting of commission income of Ukraine's banking system conducted in this study showed that further introduction of digitalization into corporate banking could contribute to their growth by at least 8% annually.

Keywords: banks, corporate banking, digitalization, financial technology, forecasting.

1. Introduction.

The use of information technology in various sectors of the global economy indicates digitalisation. The development of the digital economy before the COVID-19 pandemic was a gradual process, reflected in the slow implementation of the digital sector in the global economy. During the COVID-19 pandemic, there was a leap in the development of digitalisation, and the banking sector significantly increased the use of information technology in its business processes.

Fintech companies have begun to provide remote financial services using digital technologies. Under the influence of global trends, the banking sector has begun transforming its traditional business models by introducing ecosystem models and online platforms to provide customers with financial and non-financial services on official websites in specialised or universal mobile applications of banks (Yilmaz et al., 2023). Central banks are also interested in using digital technologies, which makes it possible to increase the efficiency of their interaction with commercial banks (Papathomas & Konteos, 2024).

Ukraine's banking system is a global digitisation leader, and martial law in the country has further accelerated the digital transformation of banks over the past two years. The digitalisation of the banking sector of Ukraine contributes to the improvement of customer service of banks owing to the convenience of digital services, accompanied by the creation of digital customer service channels, automation of banking processes, analysis, and use of vast amounts of data for more accurate forecasting and decision-making.

Banks need to adapt and anticipate customer expectations, and the more customers there are, the more difficult it is to meet their current digital expectations.

The factors of a bank's success with corporate clients in the context of digitalisation include an individual approach to each client, the development of information and communication technologies, Internet marketing, the use of biometric systems and authentication methods, and other technologies in the field of automation of the business client service system (Chaimaa et al., 2021).

Therefore, to improve the efficiency of a commercial bank, it is necessary to focus on improving the customer service system, including corporate customers, based on the latest banking technologies and remote service modes.

2. Literature review.

The digital economy contributes to the innovative and sustainable development of national economies.

Skvarčani et al. (2023) conducted a study on the effectiveness of the digital economy in the European Union and substantiated that digitalization can help to strengthen the economies of developing countries more effectively and bring them closer to the developed regions of the world at a rapid pace.

Vozkova (2022) concluded from an analysis of the structure of banking income in the euro area that the growth of commission income of EU banks indicates the expansion of banking activities into non-traditional services over the past decade. As emphasized, modern banks are becoming financial technology (Fintech) institutions that combine traditional and non-traditional activities. This is due to technological developments that have increased competition among financial institutions.

Research on the digitalization of the banking sector in retail and corporate banking, in particular, comes down to the fact that banks must be innovative, sustainable, and safe to use digital instruments in digital transformation (Pousttchi & Dehnert, 2018).

This is confirmed by the development of the digital era, which contributes to the increase of customer literacy in the field of digital banking service on the one hand, and internal motivation for bank employees on the other (Bastari et al., 2020).

Al-Slehat (2023) believes that with the development of financial technology and competition at the local and international levels, the Jordanian banking sector has undergone significant qualitative changes and a shift to digital banking, which relies heavily on financial technology. Therefore, there is an increasing need for the banking sector to activate digital marketing tools.

The transformation relevant for banks is the digitalization of banking services, which aims to strengthen and improve the relationship between the bank and the customer. The development of digital banking services can meet customer needs and expand the range of banking products and services (Yatsukh et al., 2021).

Papathomas and Conteos (2024) defined Greek banks as having reached a level of digital maturity based on digital governance and a gradual transition via three stages: digitization, growth, and adaptation.

Meier and Marthinsen (2023), analysing the activities of Swiss banks, believe that competition in digital markets requires banking institutions to navigate a variety of interrelated issues, such as cybersecurity, competition in financial technology, open banking services, including open finance and embedded finance as well as digital money.

Kopylova et al. (2023) studied the factors of digitalization of the banking sector of Ukraine and proposed a cycle of introducing digital technologies into the activities of the bank.

Panchenko et al. (2023) considered the peculiarities of using the latest technologies in the banking sector of Ukraine and concluded that in the current conditions of martial law, the quality of customer service of the country's banks is most positively affected by the development of the latest banking technologies.

The study by Miroshnyk and Kukhta (2023) focuses on the benefits of online banking services and the challenges of digitalization in the banking sector.

Antypenko et al. (2022) studying the impact of digitalization on security through modelling, found that the development of digitalization in the regions of Ukraine contributes to strengthening their financial security. It should also be noted that while there is a significant amount of scientific work on the digitalization of banks, more attention should be paid to studying the impact of the latest digital technologies on corporate banking.

3. Aim and tasks.

The study aims to analyse trends in Ukrainian banks servicing corporate clients and provide recommendations for developing digitalisation management in banking.

4. Methodology.

This study uses statistical and factor analysis methods to analyse the main indicators of corporate customer service in the current functioning of the Ukrainian banking system. The graphical method was used to visualize the analysis, the method of econometric modelling (based on STATISTICA 10) was used to develop a forecast trend in the volume of commission income of Ukraine's banking system, and the abstract and logical method was used to make theoretical generalizations about the provision of corporate customer service by banks in the context of digitalization and to draw conclusions.

Data sources for the study:

1) Information from the State Statistics Service of Ukraine (data on the number of registered business entities for 2022 – 2024);

2) Statistical data of the National Bank of Ukraine (NBU) for 2022-2024;

3) Bank income reports for 2018-2024.

The study uses descriptive statistics and regression analysis to analyse quantitative and thematic and content analysis to analyse qualitative indicators.

The main variables in the study consist of the number of business entities, the number of corporate clients of the banking system, the number of current accounts opened for business clients, the number of corporate clients' funds (in euros), the amount of banks' income (in euros), the chain growth of these indicators (in %).

The structure (in per cent) of corporate clients by legal entities and individual entrepreneurs, forms of customer service depending on the use of automation tools, current accounts of business clients in national and foreign currency, and bank revenues by their types are considered.

The formula of the built second-degree quadratic function was used to determine the growth trend of commission income in Ukraine's banking system:

$$y = a_0 + a_1t + a_2t^2 + a_3t^3 \quad (1)$$

where, y is the commission income of banks; t is period number (quarterly number); a_0 is the minimum level; a_1 , a_2 , a_3 are the values by which the next value of the time series increases.

5. Results.

Ukrainian banks compete for every prospective client, both corporate and individual ones. Corporate clients include large enterprises, medium and small businesses, and micro-businesses.

During the period of military operations in Ukraine, along with significant losses in big business due to the hostilities in the industrialized areas of the country, the number of registered legal entities and individual entrepreneurs has increased significantly (Table 1).

Table 1. Dynamics of the number of business entities in Ukraine.

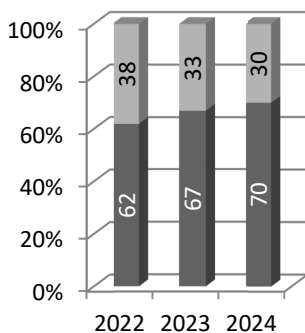
Indicators	Period			
	01.01.2022	01.01.2023	01.01.2024	01.04.2024
Number of business entities, total	2823503	2913274	3074713	3131908
Chain growth, %	100,0	103,2	105,5	101,9
Include				
Legal entities	1437009	1464953	1485979	1503782
Chain growth, %	100,0	101,9	101,4	101,2
Individual entrepreneurs	1386494	1448321	1588734	1628126
Chain growth, %	100,0	104,5	109,7	102,5

Source: based on the State Statistics Service of Ukraine (2024).

Table 1 shows that as of 01.04.2024, 3131908 business entities were registered in Ukraine, consisting of 1503782 legal entities and 1628,126 individual entrepreneurs. The number of business entities has increased the most by 2023. At the same time, the growth in the number of individual entrepreneurs (2% per quarter) was faster than that in the number of sole proprietorships (up to 1% per quarter). The growth in the number of business entities in Ukraine is reflected in the growth of bank business clients.

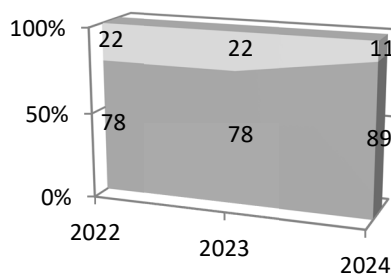
According to the National Bank of Ukraine (2024), from 01.01.2022 to 01.01.2024, the number of corporate clients of the banking system increased by 0.4 million (by 14%) and amounted to 3.3 million; the number of opened accounts increased by 1.5 million (by 27%) and amounted to 7.1 million (of which 6.9 million were current accounts). Fig. 1 shows that at the beginning of 2022, 62% of corporate sector clients were individual entrepreneurs (1.8 million), and their share increased to 70% at the beginning of 2024 (2.3 million).

Client structure by type



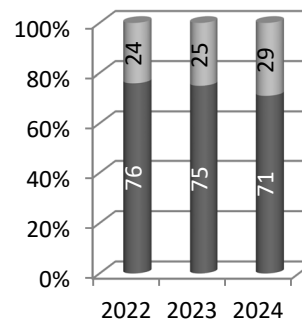
■ Individual entrepreneurs
■ Legal entities

Structure of service forms



■ Not serviced remotely
■ Remotely serviced

Current accounts structure



■ In foreign currency
■ In national currency

Fig. 1. Indicators of corporate client numbers and their accounts in Ukrainian banks in 2022-2024.

Source: based on the State Statistics Service of Ukraine (2024).

Fig. 1 shows that the share of current accounts of corporate clients opened in the national currency decreased from 76% in 2022 to 71% in 2024, but during this period, the share of business entities using remote banking increased from 78% (2.3 million) to 89% (2.9 million).

The dynamics of funds in the current accounts of corporate clients for the period under review are shown in Table 2. Bankers believe that the accumulation of funds in the current accounts of banks and corporate clients is associated with a wait-and-see business strategy during the war period. As uncertainty is associated with hostilities, companies have limited export logistics and no war risk

insurance programs; therefore, companies do not dare to use free funds for business development.

In 2024, the banking system's accounts held free current funds for corporate clients in the following proportions: 46.5% in state-owned banks, 34.5% in banks of foreign banking groups, and 17% in private banks with Ukrainian capital (National Bank of Ukraine, 2024). The most significant increases in business balances were seen in JSC Oschadbank (60%), JSC CITY BANK (48%), JSB Ukrgasbank (29%), and JSC Ukreximbank (68%). Consequently, during wartime, business representatives showed tremendous confidence in state-owned banks.

Table 2. Dynamics of funds on current accounts of banks' corporate clients, million euros at the current NBU exchange rate.

Banks	Period				
	01.01.2022	01.07.2022	01.01.2023	01.07.2023	01.01.2024
Privatbank	2670,6	3009,3	2981,1	2958,5	3444,0
Oschadbank	1861,1	1523,8	1394,2	1615,7	2191,5
Ukreximbank	1854,0	1988,1	1698,8	2202,6	2220,2
Ukrgasbank	1526,8	1749,6	1391,7	1730,4	2181,2
Raiffeisen Bank	1903,0	2259,2	2038,5	1740,0	1859,1
City Bank	968,5	1085,8	1149,3	1252,8	1320,3
Ukrsibbank	1107,4	1340,8	1393,9	1266,4	1270,7
FUIB	1153,8	1209,5	1125,3	876,7	1315,3
Sense Bank	1103,7	654,9	438,6	422,5	934,0
OTP Bank	1068,6	1223,0	1286,3	1067,2	1188,1
Total banking system	20836,6	21050,7	20058,0	19722,7	23810,6

Source: based on the National Bank of Ukraine (2024).

Analysis showed that 10 banks hold over 75% of all corporate clients' accounts. Moreover, it remained almost unchanged during the period under review (Fig. 2).

When a corporate client provides cash and settlement services at a bank, he/she also receives a number of other banking services and products. Banks are now focusing on the quality of service and digitalization of products and services in their fight for customers. The banking sector was one of the first to feel the impact of the transition on a digital interaction strategy with customers and partners.

While previously, it was enough for banks to provide customers with cheaper services than their competitors to achieve market leadership, today, banks also need to keep up with current trends, look for innovative approaches to servicing, and cooperate with third-party products and services, particularly non-bank ones. Recently, corporate clients of banks have begun to value digital services the most, and they need to have a remote information exchange channel and the ability to apply for a loan and open an account online.

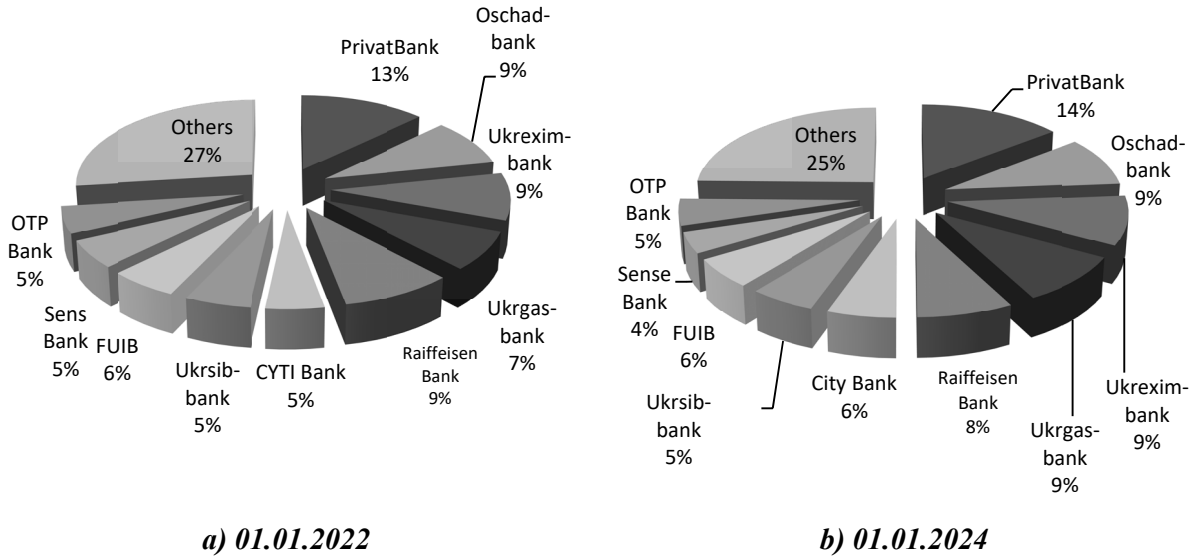


Fig. 2. Structure of Ukrainian banks by the amount of funds on corporate clients' current accounts.

Source: based on the National Bank of Ukraine (2024).

Nowadays, Ukraine's leading banks have significantly improved their online banking for corporate clients and mobile applications for SMEs and individual entrepreneurs. Fig. 3 shows the mobile applications for the corporate business of the banks mentioned above. A corporate client receives statements, invoices, and certificates

via mobile applications, makes various payments in the national currency, has payment templates and currency exchange transactions with an electronic signature, maintains electronic reporting and tax calculation, business reputation dossiers, and can obtain loans, business cards, open deposits.

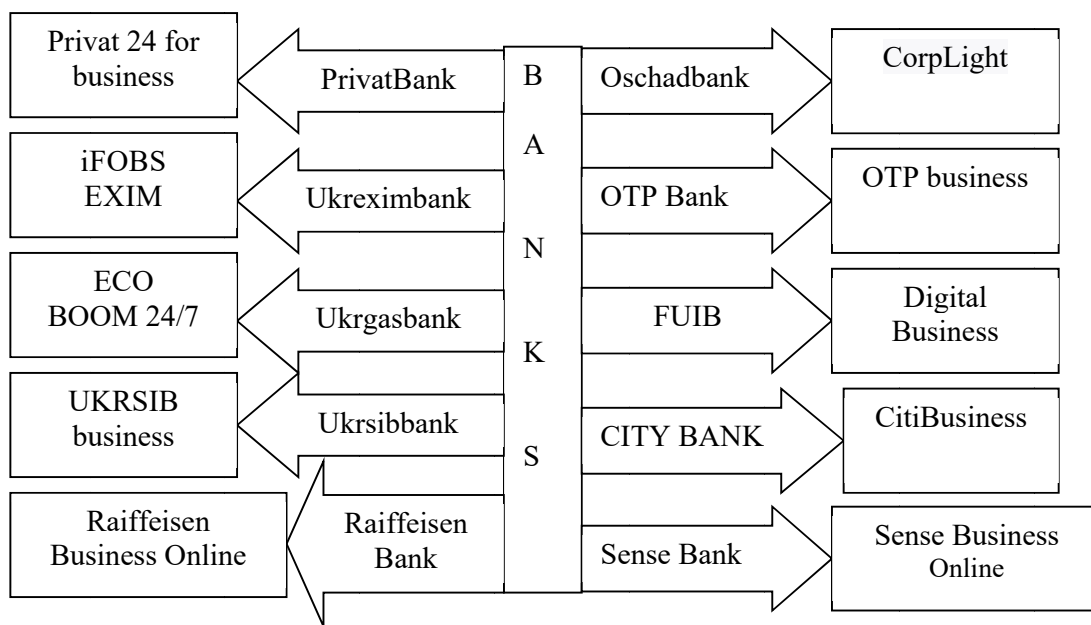


Fig. 3. Mobile applications of leading Ukrainian banks.

Considering the scope of new opportunities available to corporate clients of the Ukrainian banking system in 2023, we note that this is primarily the management of foreign exchange transactions. For example, JSC CB “PrivatBank” has launched a specialized “Trading Platform” for currency exchange transactions in the web version of “Privat24 for Business”. Using this service, a bank’s corporate clients engaged in foreign economic activities create an online application for a transaction. After approval by the bank, they independently choose the time of the currency exchange transaction and conduct it, with the funds being credited to the client’s account by the bank within a minute. JSC CB “PrivatBank” provides its corporate clients with a free TEST DRIVE of the currency space (PrivatBank, 2023). The next advantage among competitors was the introduction of a Tap to Pay contactless payment technology on Apple’s iPhone. It is worth noting that Ukraine became the seventh country in the world and the third in Europe to use this technology.

The essence of this technology is that corporate clients can accept payments from Android smartphones and iPhones (PrivatBank, 2023). As for other banks, JSB Ukgasbank has introduced a virtual corporate card that allows business clients to issue, activate, and link such a card to their smartphones (Ukgasbank, 2023). Military operations in Ukraine have accelerated the development of contactless technology. For example, JSC “Oschadbank” uses TapToPhone technology, which accepts contactless payments on an Android smartphone with an NFC in the Oschad PAY product. The application has a fiscalization function with a software cash register (PPO), and this acquiring solution corresponds to the trading POS terminal alternative. The next step in the development of acquiring in JSC “Oschadbank” will be the option to pay for goods with several cards or in parts in cash and card (partial approval) (Oschadbank, 2023).

The key results of digitalization in servicing corporate clients by Ukrainian banks are shown in Fig. 4.

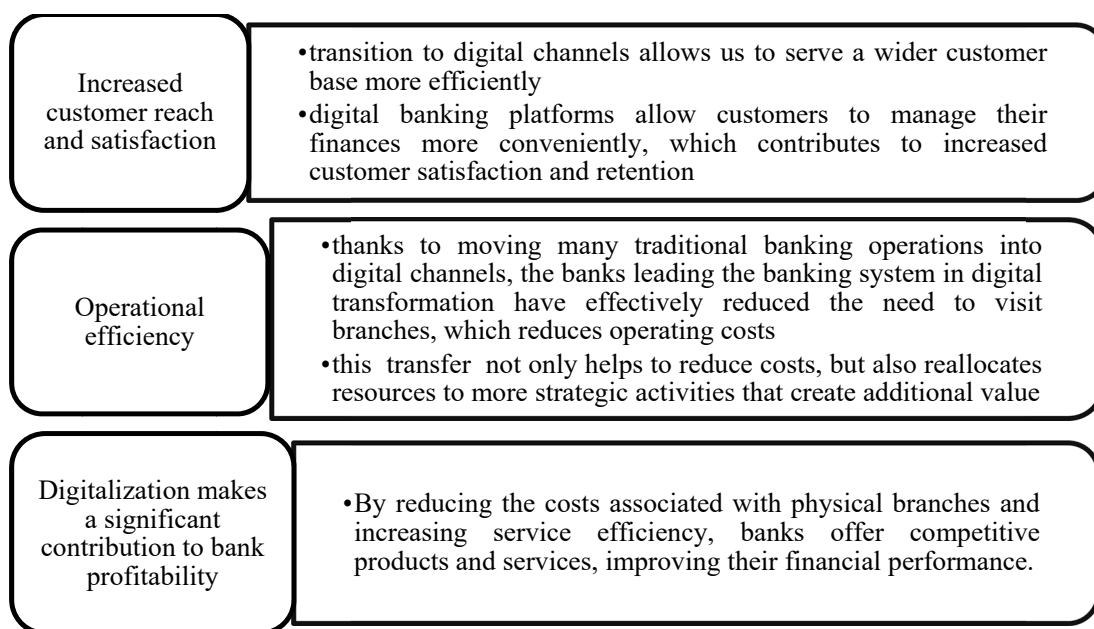


Fig. 4. Key results of digitalization in servicing corporate clients by Ukrainian banks.

Concerning increasing banks' profitability, the latest technologies enable banks to offer a variety of services in order to increase fee and commission income.

Fig. 5 shows the structure of income of the Ukrainian banking system.

Considering the income structure of the Ukrainian banking system, we note that in 2015, it consisted of 68% interest income, 14% commission income, and 18% other income, while in 2023, it was 65% interest income, 21% commission income, and 14% other income.

In turn, the commission income growth in the banking sector is due to the increasing digitalization of banks' processes, which allows them to automate several operations and thereby

increase their profitability. Consider the dynamics and structure of commission income by their types over several years for JSC CB "PrivatBank".

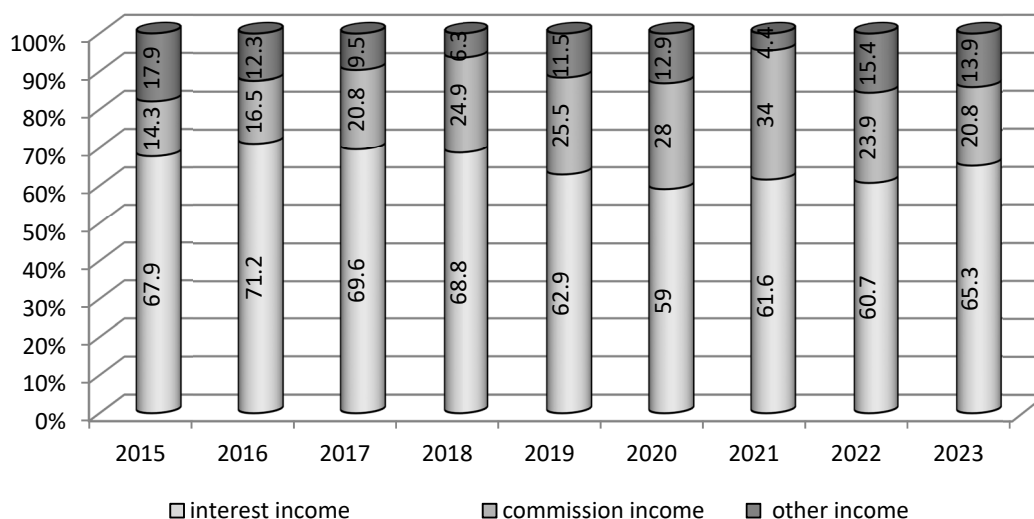


Fig. 5. Revenue structure of the Ukrainian banking system in 2015-2023.

Source: based on to the National Bank of Ukraine (2024).

JSC CB "PrivatBank" was chosen because it has the highest revenues in the banking sector of Ukraine and is one of the most technologically advanced banks in the

country's banking system. Data on the commission income of JSC CB "PrivatBank" for 2018-2023 are shown in Table 3 in terms of euros at the average annual NBU exchange rate.

Table 3. Dynamics of commission income of JSC CB "PrivatBank" for 2018-2023 billion euros at the average annual NBU exchange rate.

Commission income	Years						Deviations 2023/2018	
	2018	2019	2020	2021	2022	2023	billion euros	%
Cash and settlement services	194,5	248,2	229,7	308,9	344,7	263,8	69,3	35,6
Acquiring	109,3	168,8	213,3	279,1	196,2	278,2	168,9	154,5
International payment systems	108,2	160,2	179,4	205,0	195,2	232,0	123,8	114,4
Cash transactions	141,8	195,2	181,6	223,1	29,8	31,9	-109,9	-77,5
Other income, including	55,6	69,9	79,2	68,8	203,4	245,5	189,9	341,5
Transfers	no data available				55,9	81,2	x	x
Payments	no data available				61,2	75,8	x	x
Current accounts	no data available				31,5	35,3	x	x
Total	609,5	848,8	898,0	1085,0	969,5	1051,3	441,8	72,5

Source: based on Privatbank (2024).

Commission income of JSC CB “PrivatBank” from 2018 to 2023 in terms of euros increased by 72.5% and amounted to EUR 1,051.3 billion in 2023 (43% of commission income in the banking system). By type of income, acquiring income increased the most (2.5 times) and income from international payment systems (2.1 times). In this regard, the structure of the bank's fee and commission income has changed (Fig. 6):

the share of income from international payment systems and the share of income from acquiring have increased; the share of income from cash transactions has decreased, and significant income from transfers, payments, and current accounts, which were not present in 2018, has appeared. The growth of the bank's commission income and the change in its structure were due to the development of digital technologies.

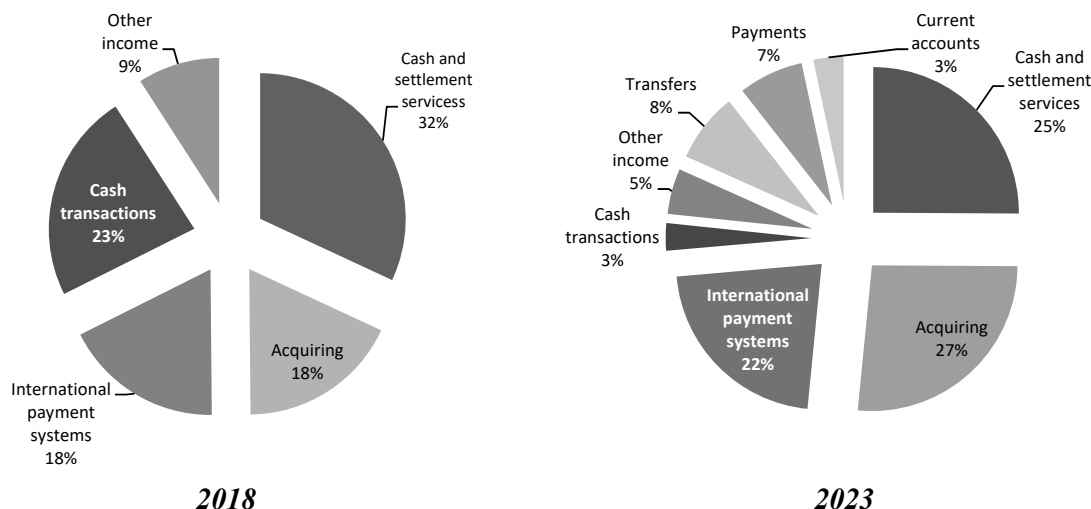


Fig. 6. Structure of commission income of JSC CB “PrivatBank”.

Source: developed according to PrivatBank (2024).

Thus, banks have long been servicing corporate clients not only by lending or placing deposits but also by several non-credit products, the volume of which is growing annually as the digitalization of banking processes improves. Thus, the growing digitalization of banks increases the

commission income in the banking sector. Commission income is forecasted for the entire banking system of Ukraine for the third and fourth quarters of 2024, building a trend using economic and mathematical methods. The data used to build these trends are listed in Table 4.

Table 4. Commission income of the Ukraine’s banking system for 2022 – 2024.

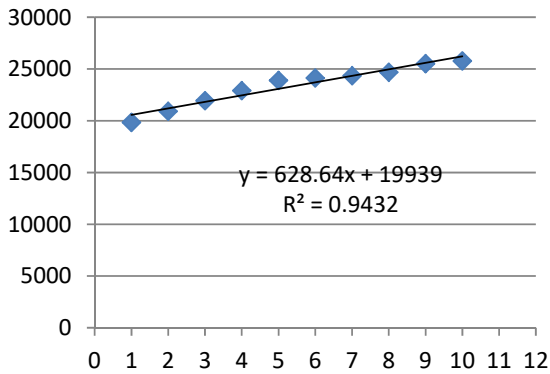
Period	Volume		Period	Volume	
	Million UAH	In million euros at the current NBU exchange rate		Million UAH	In million euros at the current NBU exchange rate
1 quarter 2022	19847	611,1	2 quarter 2023	24133	603,3
2 quarter 2022	20621	678,3	3 quarter 2023	24245	628,9
3 quarter 2022	21336	600,0	4 quarter 2023	24782	590,1
4 quarter 2022	23818	611,5	1 quarter 2024	25311	600,4
1 quarter 2023	23901	600,8	2 quarter 2024	25975	600,4

Source: based on the National Bank of Ukraine (2024).

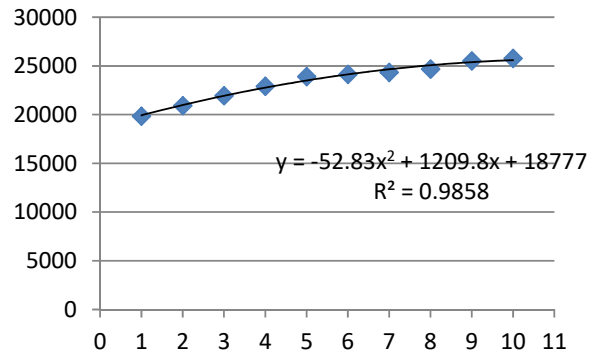
Of the models of the banking system's commission income trends for 2022-2024 built using different formulas (Fig. 7), the best-quality model is that described by the third-degree polynomial function.

$$Y = 8.0779t^3 - 186.11t^2 + 1824.5t + 18084 \quad (2)$$

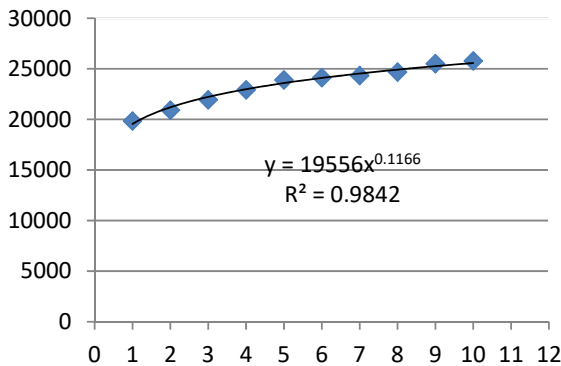
Thus, the trend line of changes in the volume of commission income by Ukrainian banks is 99.2%, which corresponds to model (1). To ensure the reliability of the forecast, the error was calculated as the ratio of the deviation of the forecast for the last period to the actual data, and its value was 0.1%, which means that the forecast can be considered reliable.



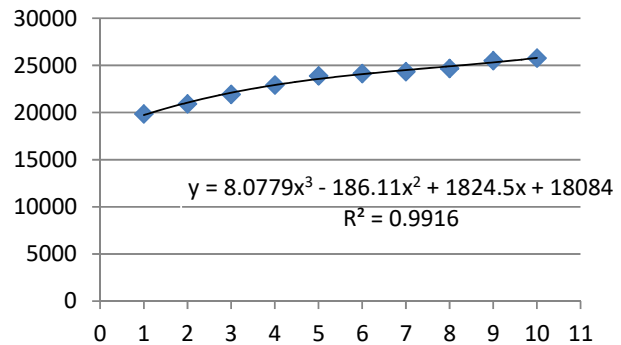
a) *Linear function*



b) *Polynomial function of the 2nd degree*



c) *Degree function*



d) *Polynomial function of the 3rd degree*

Fig. 7. Forecast trends of Ukrainian banks' commission income for 2022 – 2024.

Thus, according to the forecast, the banking system's commission income in the 3rd quarter of 2024 will amount to UAH 26.4 billion (EUR 607.5 million), and in the 4th quarter to UAH 27.1 billion (EUR 627.2 million) (Fig. 8). In 2024, it is expected to generate UAH 104.6 billion (EUR 2.4 billion) in revenues, which is 8% higher than the

actual revenues of 2023, which were 13% higher than the revenues of 2022.

As noted above, the growth in banks' commission income is directly driven by the growth in customer services made possible by the development of digital financial technologies.

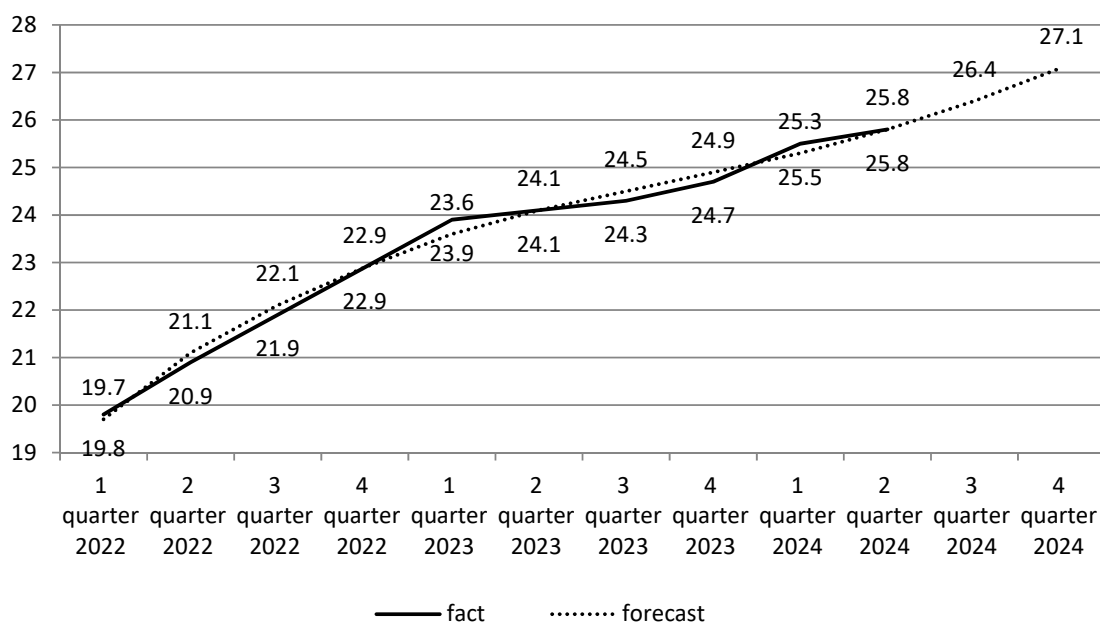


Fig. 8. Dynamics of actual and forecasted commission income of Ukraine's banking system for 2022-2024, UAH billion.

6. Conclusions.

The banking system of Ukraine is in the process of digital transformation, and classical financial institutions are transforming into high-tech platforms that can create new profit algorithms using artificial intelligence and information technologies. Currently, most Ukrainian banks are focused on the quality of service and digitalization of products and services. Achieving market leadership requires banks to provide customers with cheaper services than competitors, which obliges banks to seek innovative approaches to service, including cooperation with third-party non-banking services. In recent years, the number of corporate clients in the banking system of Ukraine has been growing annually, which increases the amount of funds stored in current and other accounts of business clients.

At the same time, three-quarters of these funds are concentrated in only ten banks, which are the most technologically advanced banks in the state. With the help of mobile applications, corporate clients receive statements, invoices, and certificates, make all types of payments with an electronic signature, and maintain electronic reporting etc.

Digitalization of banking will help improve banking products and customer interactions using information technology to increase customer satisfaction and bank profitability.

At the same time, effective digitalization management will allow banks to provide a significantly larger volume of products and services based on modern financial technologies. Digitalization of corporate client services contributed to the client base's growth and increased efficiency in banking activities. The result of the digitalization of corporate client services is an increase in the client base and customer satisfaction with banking services, increased efficiency of banking activities, reduced costs for maintaining branches, redistribution of bank resources to more strategic activities and an increase in their profitability due to an increase in the volume of commission income.

The income growth of Ukraine's banking system, including commissions, which, according to forecasts in 2024, will grow by 8% compared to the current year, can only be ensured by further digitalization of corporate banking.

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