

UDC 336.71

Romashko O.

*Ph. D. in Economics, Associate Professor,
Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine;
e-mail: les.rom@ukr.net; ORCID ID: 0000-0001-7560-2733*

Zapukhliak I.

*Doctor of Economics, Professor,
Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine;
e-mail: zapib@ukr.net; ORCID ID: 0000-0002-1218-0251*

Krykhivska N.

*Ph. D. in Economics, Associate Professor,
Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine;
e-mail: kryhivska@gmail.com; ORCID ID: 0000-0001-6807-0177*

Farat O.

*Doctor of Economics, Associate Professor,
Lviv Polytechnic National University, Ukraine;
e-mail: farat_o@ukr.net; ORCID ID: 0000-0002-2192-4136*

Kalynovskyy A.

*Ph. D. in Economics, Associate Professor,
Lviv Polytechnic National University, Ukraine;
e-mail: andrii.o.kalynovskyi@lpnu.ua; ORCID ID: 0000-0001-7927-3033*

COMMERCIAL BANKING PERFORMANCE AS PREREQUISITE FOR BUSINESS DEVELOPMENT

Abstract. The article substantiates the need to improve the performance of banks as one of the prerequisites for the economic development of business entities. To assess the performance of banks, the methodological approaches to such an assessment are generalized and their advantages and disadvantages are analyzed. The ease of use and interpretation of the results obtained has been proved when using the coefficient approach as a tool for assessing the performance of Ukrainian banks. However, in order to mitigate the main drawback of the coefficient methodological approach, which is expressed in the impossibility of obtaining an unambiguous assessment of the banking performance, it is proposed to apply a methodological approach that provides for the determination of an integral indicator of the banking performance using taxonomy methods. The use of the method of taxonomic analysis made it possible to generalize eleven relative coefficients that comprehensively characterize the banking performance: the overall efficiency of the bank, the efficiency of resource use, the structure of revenues and expenses and the efficiency of personnel use, as well as obtain an integral indicator of development. The proposed methodology for assessing the level of banking performance was tested on the example of state banks of Ukraine with their subsequent ranking. In particular, the authors found that JSC «Oschadbank» was the leader in terms of performance in 2017. However, during 2018—2019, the leadership passed to JSC CB «PrivatBank». The need to improve the performance of JSC «Ukreximbank» and JSB «Ukrasbank» was proved, since JSC «Ukreximbank» was characterized by a decrease in business performance, and the lowest level of performance was found in JSB «Ukrasbank». We believe that research on the main reasons for the decline in the banking performance and the impact of such trends on economic growth, including the development of entrepreneurship, is promising and practically significant.

Keywords: efficiency, assessment, bank, taxonomy, integrated indicator, economic growth, entrepreneurship.

JEL Classification G21

Formulas: 0; fig.: 1; tabl.: 5; bibl.: 18.

Ромашко О. М.

*кандидат економічних наук, доцент,
Івано-Франківський національний технічний університет нафти і газу, Україна;
e-mail: les.rom@ukr.net; ORCID ID: 0000-0001-7560-2733*

Запихляк І. Б.

*доктор економічних наук, професор,
Івано-Франківський національний технічний університет нафти і газу, Україна;
e-mail: zapib@ukr.net; ORCID ID: 0000-0002-1218-0251*

Крихівська Н. О.

*кандидат економічних наук, доцент,
Івано-Франківський національний технічний університет нафти і газу, Україна;
e-mail: kryhivska@gmail.com; ORCID ID: 0000-0001-6807-0177*

Фарат О. В.

*доктор економічних наук, доцент,
Національний університет «Львівська політехніка», Україна;
e-mail: farat_o@ukr.net; ORCID ID: 0000-0002-2192-4136*

Калиновський А. О.

*кандидат економічних наук, доцент,
Національний університет «Львівська політехніка», Україна;
e-mail: andrii.o.kalynovskyi@lpnu.ua; ORCID ID: 0000-0001-7927-3033*

ЕФЕКТИВНІСТЬ ДІЯЛЬНОСТІ КОМЕРЦІЙНИХ БАНКІВ ЯК ПЕРЕДУМОВА РОЗВИТКУ ПІДПРИЄМНИЦТВА

Анотація. Обґрунтовано необхідність підвищення ефективності діяльності банків як однієї з передумов економічного розвитку суб'єктів підприємництва. Для оцінювання ефективності діяльності банків узагальнено методичні підходи до такого оцінювання та проаналізовано їх переваги і недоліки. Доведено простоту використання та інтерпретації отриманих результатів при застосуванні коефіцієнтного підходу як інструмента оцінки ефективності діяльності українських банків. Проте, для нівелювання основного недоліку коефіцієнтного методичного підходу, що виражається у неможливості отримання однозначної оцінки щодо ефективності банківської діяльності, запропоновано застосувати методичний підхід, що передбачає визначення інтегрального показника ефективності банківської діяльності з використанням прийомів таксономії. Застосування методу таксономічного аналізу дозволило узагальнити одинадцять відносних коефіцієнтів, що всебічно характеризують ефективність банківської діяльності: загальну ефективність роботи банку, ефективність використання ресурсів, структуру доходів та витрат та ефективність використання персоналу, і отримати інтегральний показник розвитку. Запропоновану методику оцінювання рівня ефективності банківської діяльності апробовано на прикладі державних банків України з наступним їх ранжуванням. Зокрема, авторами встановлено, що лідером за рівнем ефективності у 2017 році був АТ «Ощадбанк». Проте упродовж 2018—2019 років лідерство перейшло до АТ «Приватбанк». Доведено необхідність удосконалення забезпечення ефективності діяльності АТ «Укрексімбанк» та АТ «Укргазбанк», оскільки АТ «Укрексімбанк» характеризувався зниженням ефективності бізнесу, а найнижчий рівень ефективності виявлено у АТ «Укргазбанк». Перспективним та практично значущим вважаємо дослідження основних причин зниження ефективності банківської діяльності та вплив таких тенденцій на економічне зростання, в тому числі на розвиток підприємництва.

Ключові слова: ефективність, оцінювання, банк, таксономія, інтегральний показник, економічне зростання, підприємництво.

Формул: 0; рис.: 1; табл.: 5; бібл.: 18.

Introduction. Due to the crisis in the economy of our country, and the general stagnation of world processes caused by the pandemic, among other things, the question of finding ways to prevent further curtailment of the economy and ensure the sustainability of the functioning of business entities becomes urgent. One of such ways, as proved in the works of many scientists [1—4], is the development of the financial sector, which will have a positive impact on economic growth. Thus, since one of the main subjects of the financial system are banks, we aim to establish the level of their performance today in order to find ways to improve their work in the future to support the economic development of business entities.

Literature review and the problem statement. Foreign and domestic scientists use a number of methodological approaches to assessing the banking performance. Scientists limit themselves to analyzing the key performance indicators, namely return on assets (ROA), return on equity (ROE), net interest margin (NIM), net interest rate spread (NIRS) and the like [5; 6].

E. Grmanová and E. Ivanová propose to study the performance of banking institutions based on the analysis of the amount of data (DEA model). The component composition of the model they propose is as follows: inputs (liabilities to banks and customers, operating cost); outputs (loans and advances to banks and customers, non-interest income) [7]. M. Fethi, F. Pasiouras [8], J. Paradi, H. Zhu [9] also consider it expedient to use the nonparametric DEA method when assessing the banking performance.

However, some scientists propose to estimate the parameters of inefficiency. For example, S. V. Leonov, T. A. Vasylieva, A. V. Buriak suggest using the indicator of lost profit as a bank performance indicator, which they determine based on stochastic frontier analysis [10].

Based on the results of a theoretical analysis of existing approaches to evaluating the bank performance, two methodological approaches have been identified:

- approach of financial ratios and technical and economic indicators;
- econometric approach based on the construction of the efficiency frontier.

Within the framework of this approach, two methods exist in parallel:

- a) parametric — is based on econometric analysis and provides for an assessment of the efficiency function, which does not exist in reality;
- b) nonparametric — is based on mathematical programming and provides for the use of an already known efficiency frontier and an assessment of efficiency, rather than its precise calculation.

The above approaches differ in terms and scope of application, information base and mathematical tools for their analysis, as well as analysis models. The advantages and disadvantages of using these methods are summarized in *Table 1*.

Table 1

**Strengths and weaknesses of methods for assessing
the bank’s performance**

Methods of assessment	Strengths	Weaknesses
Financial Ratios Approach	<ul style="list-style-type: none"> - methodological transparency, that is, calculating the coefficients does not require special knowledge; - ease of interpretation of the data obtained; - availability for all subjects of assessment; - ability to determine the boundaries and the ideal level of certain coefficients; - ability to indicate directions for improvement 	<ul style="list-style-type: none"> - complexity of the final conclusion about the level of bank’s performance; - impossibility of taking into account such characteristics of performance as multifactoriality, relativity and stochasticity; - retrospective nature of the assessment; - impossibility of determining the promising directions of the bank’s development; - use at the operational and tactical levels of management and the impossibility of use at the strategic management of the bank; - impossibility of comparing the values of the coefficients in different countries due to differences in the calculation methods

Table 1 (continued)

Methods of assessment	Strengths	Weaknesses
Parametric models (DEA, TFA, SFA)	<ul style="list-style-type: none"> - taking into account such characteristics of performance as stochasticity, that is, the level of efficiency and not a clear calculation is assessed; - give an idea of the significance of the solution found, that is, there is no need to check the significance of the estimates obtained and the influence of various factors; - ability to take into account random inaccuracies 	<ul style="list-style-type: none"> - labor intensity; - need to use a special mathematical apparatus; - availability of an appropriate information base for researching the bank's activities; - need for a clear definition of the form of the «frontier» of efficiency, which increases the subjectivity of the results of the assessment
Nonparametric models (DEA, FDH)	<ul style="list-style-type: none"> - there is no need to clearly define the form of the «frontier» of efficiency; - mandatory presence of banks with 100% efficiency 	<ul style="list-style-type: none"> - labor intensity; - need to use a special mathematical apparatus; - clear calculation (and not assessment) of efficiency values; - initial assumption about the absence of random errors

Source: improved by the authors for [11, c. 61; 12; 13].

To generalize the results of the analysis of the bank's performance, obtain a comprehensive assessment and conduct a comparative characteristic with other banks, we propose to determine the integral indicator of the bank's performance by constructing a taxonomic indicator of development.

The purpose of the article is to substantiate the taxonomy method for a comparative assessment of the commercial banks' performance and to test it on the example of state banks in Ukraine.

Research methods. In the study, the following general scientific dialectical and specific economic methods were used: analysis, synthesis, comparison and generalization – when studying the developments of Ukrainian and foreign scientists; structural and logical – when presenting the author's vision of an algorithm for constructing and determining an integral taxonomic indicator for assessing the bank's performance; analytical, index, comparison — to analyze the current state and development trends of state banks; cross classification — for building statistical tables aimed at summarizing reporting data; coefficient, indicator and taxonomic analysis — when determining the integral taxonomic indicator; tabular — to display analytical and statistical information, a schematic representation of a number of theoretical and practical provisions of scientific work.

Research results. The process of an integral assessment of the bank's performance consists of a number of successive stages, starting with the formation of requirements for the construction of an integral taxonomic indicator Y , the selection and calculation of values of particular indicators characterizing the bank's performance, as well as the procedure for calculating an integral taxonomic indicator for assessing the bank's performance (*Fig.*).

The system of 11 relative coefficients, which are proposed by the rating agency «IBI-Rating», meets the requirements for constructing an integral indicator for assessing the bank's performance, given in stage 1, *Fig.* This system of indicators is grouped into the following four groups [14], characterizing various aspects of performance:

- general performance indicators for banks;
- indicators of the efficiency of using the bank's resources;
- indicators of management efficiency of revenue and expenses;
- indicators of the effectiveness of the use of staff.

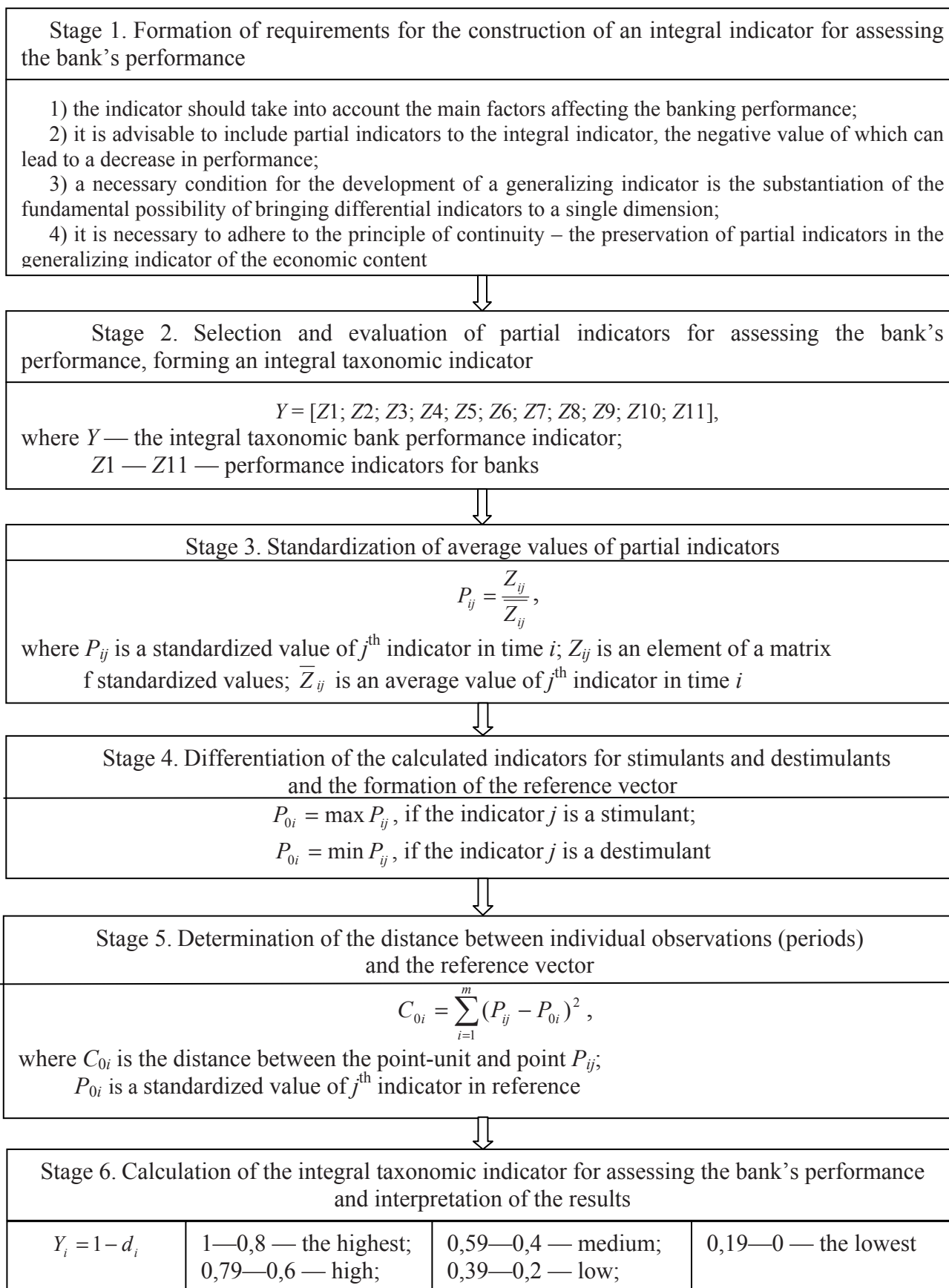


Fig. The sequence of stages of construction and determination of the integral taxonomic indicator for assessing the bank's performance

Source: generated by the authors.

Calculation formulas, standard values and the economic content of indicators are listed in Table 2.

Table 2

Performance indicators for banks

Indicator	Calculation formula	Standard value	Economic content of the indicator
<i>1. General Performance Indicators For Banks</i>			
Return On Assets (ROA), Z1	Net Income / Average Total Assets · 100%	> 1 %	It characterizes the ability of management to effectively manage the bank's assets. Indicates the amount of net income that each hryvnia of assets generates.
Return On Equity (ROE), Z2	Net Income / Average Shareholder's Equity · 100%	> 15%	It characterizes the efficiency of the bank's use of its own capital. Indicates the amount of net income that was generated for each hryvnia of own funds.
<i>2. Indicators of the efficiency of using the bank's resources</i>			
Total Yield Assets (TYA), Z3	Total Revenue / Average Total Assets · 100%	> 14%	It characterizes the efficiency of using the bank's assets. Shows the level of revenue per unit of assets used by the bank.
Net interest margin (NIM), Z4	Net Interest Income / Average Total Assets · 100%	> 4,5%	It characterizes the bank's ability to receive income, namely, differential interest income as a percentage of assets. Indicates the amount of net interest income that each hryvnia of assets generates.
Net Interest Rate Spread (NIRS), Z5	(Interest Income / Average Earning Assets · 100%) — (Interest Expenses / Average Interest Bearing Liabilities · 100%)	> 1,25%	It characterizes bank's performance as an intermediary between depositors and borrowers, as well as the level of competition in the market. Shows the difference between the weighted average interest on assets and liabilities of the bank.
<i>3. Indicators of management efficiency of revenue and expenses</i>			
Efficiency Bank Ratio, Z6	Total Revenue / Total Expenses · 100%	> 120%	It characterizes bank's performance. Shows the level of revenue received from each hryvnia cost.
The share of net Interest Income and Commission Income in Operating income, Z7	(Net Interest Income + Net Commission Income) / Operating income · 100%	> 80%	It characterizes the bank's ability to make a profit from the paid placement of funds and from making payments and providing related services. Shows what part of the bank's operating income is occupied by income generated by the interest margin and commissions received from clients.
The share of Selling, General and Administrative Expenses (Total SG&A Expenses) Operating income, Z8	Total SG&A Expenses / Operating Income	< 70%	It characterizes the management level of bank's total SG&A expenses. Shows the amount of the bank's operating income, which falls on the expenses associated with its business activities.
Providing the administrative and economic apparatus Ratio, Z9	Total SG&A Expenses / Total Expenses · 100%	< 35%	It characterizes the level of SG&A expenses. Shows what part of the bank's expenses is occupied by the expenses of maintaining its administration.
<i>4. Indicators of the effectiveness of the use of staff</i>			
The ratio of Earnings Before Tax and taxation to Labor Costs, Z10	Earnings Before Tax / Labor Costs · 100%	> 100%	It determines the cost recovery of labor costs and allows one to evaluate the result of personnel decisions to motivate employees. Indicates the amount of earnings before tax per unit of labor costs.
The ratio of Labor Costs to assets, Z11	Labor Costs / Average Total Assets · 100%	< 2%	It characterizes the degree of influence of labor costs on the economic activity of the bank, expressed in the total volume of its assets. Shows the amount of labor costs per unit of bank assets.

Source: improved by the authors for [14].

The division of indicators into stimulants and destimulants is the basis for constructing a reference vector. In accordance with the direction of influence of the selected particular characteristics on the generalizing indicator, we will differentiate the bank performance indicators. Thus, the stimulants include the return on assets (Z1), return on equity (Z2), total yield assets (Z3), net interest margin (Z4), net interest rate spread (Z5), efficiency bank ratio (Z6), the share of net interest income and commission income in operating income (Z7) and the ratio of earnings before tax and taxation to labor costs (Z10). All other partial indicators are destimulants.

Using the above methodology of the rating agency «IBI-Rating» on the basis of the financial statements of four state-owned banks of Ukraine, the calculation of indicators characterizing the level of their performance during 2017—2019 was carried out, *Table 3*.

Table 3

Values of performance indicators of state-owned banks of Ukraine

Indicator	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	Z11
JSC CB «PrivatBank»											
2017	-10,40	-200,03	19,04	2,66	4,56	64,70	-123,80	-92,59	18,01	-524,13	1,98
2018	4,80	45,50	20,61	6,29	7,32	130,35	230,53	101,03	33,22	223,23	2,15
2019	11,10	75,84	23,70	6,69	6,70	188,04	147,72	57,81	40,00	446,70	2,48
JSC «Oschadbank»											
2017	0,25	2,38	11,52	2,48	2,76	102,23	1469,68	1276,59	28,46	17,30	1,45
2018	0,07	0,65	11,90	2,41	2,71	100,12	5495,15	5275,06	31,88	0,82	1,77
2019	0,11	1,34	12,66	2,35	3,22	100,87	3799,45	3844,66	33,48	5,62	1,94
JSC «Ukreximbank»											
2017	0,47	8,10	8,58	0,97	1,77	107,29	567,34	430,17	12,71	101,89	0,57
2018	0,51	7,58	9,13	1,15	1,86	105,95	197,72	162,26	14,51	64,02	0,80
2019	0,04	0,73	11,47	1,17	2,61	100,37	62,58	61,50	13,80	4,19	1,00
JSB «Ukrgasbank»											
2017	1,02	11,49	15,53	3,83	4,76	105,80	746,99	454,56	19,60	57,45	1,48
2018	1,02	13,51	15,56	3,91	5,73	108,09	409,48	235,19	19,61	73,32	1,59
2019	1,28	18,40	13,92	2,72	6,86	110,61	820,13	576,72	21,11	90,35	1,48

Source: calculated by the authors using the materials [15—18].

The analysis of profitability ratios allows us to draw conclusions about the insufficiently successful development of state-owned banks, since effective asset management at the maximum permissible level was noted only for JSB «Ukrgasbank». In JSC CB «PrivatBank», the return on assets for 2018—2019 is above the norm. The growth trend of this indicator is ensured by the high quality of management, an increase in operational risks (economically justified or not). In general, state banks do not effectively use their own capital, since only in JSC CB «PrivatBank» the indicator is higher than the recommended value during 2018—2019.

The indicators of the efficiency of using bank resources are used to assess how correctly and optimally the bank allocates its resources in order to achieve the maximum level of revenue. Only in JSC CB «PrivatBank» the total return on assets during the period under review was higher than the recommended value and had a growing trend, which indicates the improvement of the bank's performance, while in JSB «Ukrgasbank» the indicator was at the minimum level with a downward trend. The net interest margin ratio shows that among banks only in JSC CB «PrivatBank» in 2018—2019 banking operations were effective. Other banks are not able to obtain a sufficient level of profit by attracting resources on favorable terms and their subsequent effective use. The net spread ratio shows that all state-owned banks had an effective level of consistency of interest rate policy on lending and deposit operations. However, JSC CB «PrivatBank» and JSB «Ukrgasbank» obtained the highest values of the net spread.

The indicators of revenue and expenses management of state-owned banks in Ukraine also demonstrate the inefficiency of their activities. In particular, almost the same level of revenue and expenses in JSC «Oschadbank» and JSC «Ukreximbank», and insufficient — in JSC «Ukreximbank» is a negative trend. The share of Selling, General and Administrative Expenses in

operating profit significantly exceeds the recommended value and is a negative indicator of the performance of these banks. Only in 2019, JSC «Ukreximbank» and JSC CB «PrivatBank» were able to optimize the amount of Selling, General and Administrative Expenses.

The efficiency of banking institutions is evidenced by the level of net commission and interest income in operating income, which is significantly more than 80%. However, in JSC «Ukreximbank» at the end of the period there was a decrease in the level of the bank’s revenue generated by the interest margin and commissions received from customers. In addition, the level of expenses for the maintenance of the bank’s administration in the total amount of expenses is below the recommended limit; however, it has a growing trend.

As for the staff performance indicators, labor costs should be proportional to the volume of the bank’s assets and not exceed 2%. Only JSC CB «PrivatBank» slightly exceeded the recommended value. However, the recoupment of labor costs in comparison with the amount of earnings before tax is insufficient in all state-owned banks, except for JSC CB «PrivatBank».

At the next stage, it is advisable to define a standardized system of partial performance indicators, *Table 4*.

Table 4

Standardized system of performance indicators for state-owned banks

Indicator	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	Z11
JSC CB «PrivatBank»											
2017	-5,67	7,63	0,90	0,51	0,74	0,51	-1,46	-4,19	0,59	-10,78	0,90
2018	2,62	-1,73	0,98	1,21	1,18	1,02	2,72	4,57	1,09	4,59	0,97
2019	6,05	-2,89	1,12	1,28	1,08	1,47	1,74	2,62	1,32	9,19	1,13
JSC «Oschadbank»											
2017	1,74	1,63	0,96	1,03	0,95	1,01	0,41	0,37	0,91	2,19	0,85
2018	0,50	0,45	0,99	1,00	0,94	0,99	1,53	1,52	1,02	0,10	1,03
2019	0,76	0,92	1,05	0,97	1,11	1,00	1,06	1,11	1,07	0,71	1,13
JSC «Ukreximbank»											
2017	1,38	1,48	0,88	0,89	0,85	1,03	2,06	1,97	0,93	1,80	0,72
2018	1,50	1,39	0,94	1,04	0,89	1,01	0,72	0,74	1,06	1,13	1,01
2019	0,12	0,13	1,18	1,07	1,25	0,96	0,23	0,28	1,01	0,07	1,27
JSB «Ukrigasbank»											
2017	0,92	0,79	1,04	1,10	0,82	0,98	1,13	1,08	0,97	0,78	0,98
2018	0,92	0,93	1,04	1,12	0,99	1,00	0,62	0,56	0,98	0,99	1,05
2019	1,16	1,27	0,93	0,78	1,19	1,02	1,24	1,37	1,05	1,23	0,97

Source: calculated by the authors.

Thus, for JSC CB «PrivatBank» the reference vector has the following coordinates:

$P = (6,05; 7,63; 1,12; 1,28; 1,18; 1,47; 2,72; 2,62; 0,59; 9,19; 0,90)$.

For JSC «Oschadbank» the reference vector has the following coordinates:

$P = (1,74; 1,63; 1,05; 1,03; 1,11; 1,01; 1,53; 0,37; 0,91; 2,19; 0,85)$.

Thus, for JSC «Ukreximbank» the reference vector has the following coordinates:

$P = (1,50; 1,48; 1,18; 1,07; 1,25; 1,03; 2,06; 0,28; 0,93; 1,80; 0,72)$.

For JSB «Ukrigasbank» the reference vector has the following coordinates:

$P = (1,16; 1,27; 1,04; 1,12; 1,19; 1,02; 1,24; 0,56; 0,97; 1,23; 0,97)$.

The values of the integral taxonomic indicator for assessing the performance of the studied banks for 2017—2019 are given in *Table 5*.

Table 5

The value of the integral taxonomic bank performance indicator

Indicator	d_i	Y_i	Development level
JSC CB «PrivatBank»			
2017	0,563	0,437	medium
2018	0,117	0,883	the highest
2019	0,105	0,895	the highest

Table 5 (continued)

Indicator	d_i	Y_i	Development level
JSC «Oschadbank»			
2017	0,084	0,916	the highest
2018	0,567	0,433	medium
2019	0,296	0,704	high
JSC «Ukreximbank»			
2017	0,181	0,819	the highest
2018	0,158	0,842	the highest
2019	0,591	0,409	medium
JSB «Ukrgasbank»			
2017	0,800	0,200	low
2018	0,585	0,415	medium
2019	0,700	0,300	low

Source: calculated by the authors.

The interpretation of this indicator is as follows: a commercial bank has the better the performance level, the closer to 1 the value of the integral indicator is.

In JSC CB «PrivatBank», the dynamics of the general indicator during 2017—2019 had a growing trend from the medium level to the highest. The taxonomic indicator in JSC «Oschadbank» at the beginning of the period under review was at the highest level. In 2018, there was a significant decrease in the indicator to the medium level (0,433) caused by a decrease in the indicators of stimulants. However, according to the results of 2019, the integral indicator for assessing the bank's performance was 0.704, which is evidence of increasing the level of banking performance. In JSC «Ukreximbank» the situation worsened, as the value of the integral indicator decreased from the highest level to the medium. The low performance level of JSB «Ukrgasbank» indicates the need to improve the performance of this bank.

Conclusions. Based on the study, it has been established that the level of banking performance can be identified using a number of approaches, each of which has certain advantages and disadvantages in application. We have proposed a methodological approach to assessing the banking performance based on the definition of an integral taxonomic indicator. The use of the method of taxonomic analysis made it possible to generalize 11 relative coefficients characterizing various aspects of performance: general performance for banks, the efficiency of using the bank's resources, management efficiency of revenue and expenses, the effectiveness of the use of staff, and to obtain an integral indicator of development, which in turn is the basis for finding solutions to improve the commercial banks' performance. The results of the taxonomic analysis carried out made it possible to rank the state banks of Ukraine according to the main performance indicators during 2017—2019. The highest level of performance efficiency was noted in JSC CB «PrivatBank», and a low level of performance efficiency was revealed in JSB «Ukrgasbank». Prospects for the development of further research in the direction of establishing the magnitude of the impact of the banking performance and the development of entrepreneurship are substantiated, since theoretically scientists have proved a close relationship between the development of the financial system and economic growth.

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Статтю рекомендовано до друку 19.04.2021

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The article is recommended for printing 19.04.2021

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