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### **MANAGEMENT OF COMPETITIVENESS OF THE BANKING SERVICES**

**Abstract.** In particular, the process of adapting commercial banks to rapidly changing macro- and micro-conditions is of particular importance in the context of the economic and banking sector crisis phenomena, which in turn affects the quality and, accordingly, competitiveness of banking services. Increasing the competitiveness of banking services of Ukrainian banks and ensuring the competitiveness of the domestic banking system is a prerequisite for ensuring sustainable economic growth. In view of this, the authors updated the issues of assessing the competitiveness of banking services offered in the market, using methods of economic and mathematical modeling. In assessing the competitiveness of banking services, research methods such as analysis and synthesis, the method of comparison, economic-statistical, mathematical, grouping and modeling, table and graphic are used.

The work also used the modification of the Saati method as a hierarchy analysis method from the point of view of replacing the Saati estimates in the matrix of pairwise comparisons based on the numerical relations of the corresponding characteristics of the model's factors. Thus, the competitiveness of the banking service «Credit» of JSC Oschadbank, PJSC CB «Privatbank», JSC «Raiffeisen Bank Aval», JSC «Kredobank», JSC «Alfabank» and PJSC CB «Taskombank» on the basis of its economic and consumer properties.

The approach proposed by the authors to assess the competitiveness of banking and banking services, allows positioning services of a competitive bank in the financial market. For each commercial bank it is possible to determine the position and establish the competitive advantages of banking services in comparison with similar services of other commercial banks.

Using the proposed model provides an opportunity to assess the competitiveness of the banking institution in terms of the competitiveness of banking services and should become a complete and informative information tool for managing the competitive advantages of domestic commercial banks.

**Keywords:** banking system, competitiveness, commercial bank, banking market, credit, Saati method, modeling.

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## УПРАВЛІННЯ КОНКУРЕНТОСПРОМОЖНІСТЮ БАНКІВСЬКИХ ПОСЛУГ

**Анотація.** Процес адаптації комерційних банків до мінливих макро- та мікро-умов є особливо важливим у контексті кризових явищ економічного та банківського секторів, що, у свою чергу, впливає на якість та, відповідно, конкурентоспроможність банківських послуг. Підвищення конкурентоспроможності банківських послуг українських банків та забезпечення конкурентоспроможності вітчизняної банківської системи є передумовою забезпечення сталого економічного зростання. З огляду на це, автори поновили питання оцінки конкурентоспроможності банківських послуг, що пропонуються на ринку, за допомогою методів економіко-математичного моделювання. При оцінці конкурентоспроможності банківських послуг використовуються методи аналізу і синтезу, економіко-статистичний, метод порівняння, математичний, групування і моделювання, табличний і графічний.

Використано також модифікацію методу Сааті як методу аналізу ієрархії з точки зору заміни оцінок Сааті в матриці попарних порівнянь на основі числових співвідношень відповідних характеристик факторів моделі. Таким чином, проранжовано конкурентоспроможність банківської послуги «Кредит» ВАТ «Ощадбанк», ПАТ КБ «Приватбанк», ВАТ «Райффайзен Банк Аваль», ВАТ «Кредобанк», АТ «Альфабанк» та ПАТ КБ «Таскомбанк» на основі своєї економічної та споживчі властивості.

Підхід, запропонований авторами для оцінки конкурентоспроможності банківської справи і банківських послуг, дозволяє позиціонувати послуги конкурентного банку на фінансовому ринку. Для кожного комерційного банку можна визначити позицію та встановити конкурентні переваги банківських послуг у порівнянні з аналогічними послугами інших комерційних банків.

Використання запропонованої моделі дає можливість оцінити конкурентоспроможність банківської установи з точки зору конкурентоспроможності банківських послуг і повинна стати повноцінним і інформативним інформаційним інструментом управління конкурентними перевагами вітчизняних комерційних банків.

**Ключові слова:** банківська система, конкурентоспроможність, комерційний банк, ринок банківських послуг, кредит, метод Сааті, моделювання.

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## **УПРАВЛЕНИЕ КОНКУРЕНТОСПОСОБНОСТЬЮ БАНКОВСКИХ УСЛУГ**

**Аннотация.** Проведена оценка конкурентоспособности банковских услуг с помощью приемов экономико-математического моделирования путем использования модификации метода Саати. Проранжированы конкурентоспособность банковской услуги «Кредит»АО «Ощадбанк», АО «Райффайзен банк Аваль», АО «Альфабанк», АО«Кредобанк»та ПАО КБ «Таскомбанк»на основе ее экономических и потребительских свойств. Использование предложенной модели дает возможность оценить конкурентоспособность банковского учреждения с точки зрения конкурентоспособности банковских услуг и должен стать основательным и содержательным информационным инструментом управления конкурентными преимуществами отечественных коммерческих банков.

**Ключевые слова:** банковская система, конкурентоспособность, коммерческий банк, рынок банковских услуг, кредит, метод Саати, моделирования.

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**Introduction.** Today, commercial banks are operating in an ever-changing general economic, social and political situation that affects the reliability and efficiency of their activities. To date, problems of ensuring the efficiency of banking activity and stability of the banking system of Ukraine as a whole have become important.

Expanding the spectrum of banking services provided to customers allows redistributing financial risks, reducing their negative impact on the efficiency of the bank, creating new revenue channels. The foregoing actualizes the issue of growth of volumes of provision of banking services and an increase in their share in the overall structure of revenues of domestic banks. In times of recurring crisis phenomena, the process of adapting commercial banks to rapidly changing macro- and micro-conditions is of particular importance, which in turn cannot but affect the quality and, accordingly, the competitiveness of banking services. Increasing the competitiveness of banking services of Ukrainian banks and ensuring the competitiveness of the domestic banking system is the encouragement of socio-economic development of the country and ensuring sustainable growth of the economy. In view of this, there is a need to assess the competitiveness of the banking services offered by the market using some of the most effective tools — methods of economic and mathematical modeling. The problem of developing an adequate mathematical model for assessing the competitiveness of banking services is at the same time extremely relevant and difficult.

**Research analysis and problem statement.** Some aspects of competitive relations in the banking system were researched in scientific papers by such domestic and foreign scholars: Vasilchuk I. [1], Vovk V. [2], Zaruba Yu. [3], Kovalenko V. [4], Kolesova P. [5], Kolomyets I. [6], Salo I. and Miroshnichenko O. [9], Tregulova N., Vasiliev T. [12], Khalatur S., Zhilenko K., Masyuk Yu., Velichko L. and Kravchenko M. [14] and others.

Despite the achievements of domestic and foreign scientists in addressing the problem of managing the competitiveness of banking services, there are a number of issues related to finding ways to increase the efficiency of managing the competitiveness of banking services in a changing environment of the bank. A further system of assessing the effectiveness of banking services needs further scientific and methodological developments.

In view of this, there is a need for further research in combining theoretical developments with methods of economic and mathematical modeling for analyzing, quantifying and identifying

the competitive advantages of banking services offered on the market to manage the competitiveness of banking services, building an effective policy of providing quality services and ensuring a high the competitive position of a banking institution in the market.

**The aim of the work** is to assess the competitiveness of banking services through the method of economic and mathematical modeling to form the competitive advantages and positions of a banking institution and ensure an effective policy of providing services by a commercial bank.

**Methods of research.** Analysis and synthesis, comparison method, economic-statistical, mathematical, grouping and modeling, tabular and graphical are used in the assessment of the competitiveness of banking services.

**Research results.** In today's competitive environment, competition is based on a strategy of protection market participants and defend their interests.

The competitive strategy determines the direction of the commercial bank's activities in financial, production, personnel and other areas of operation in order to achieve long-term competitive advantages over other banks. A commercial bank that has managed to create, maintain and skillfully use competitive advantages becomes competitive. Assessment of the bank and banking services is one of the steps in managing their competitiveness.

An assessment of the bank's competitiveness and banking services allows positioning the services of a competitive bank in the financial market. To date, there is no single method for measuring it.

The mathematical modeling is powerful tool to studying, analyzing and forecasting economic processes. Our task is to create a model for assessing the competitiveness of banking services, taking into account the multiplicity of factors of influence. To date, a number of approaches have been developed to determine the optimal solution in terms of multicriteriality. As noted by Trunova O.V. [13], a special place here occupies the method of analysis of hierarchies, proposed by T. Saati [10]. This method finds its practical application in a wide variety of fields: real estate valuation, planning and decision making in the economy, software development, project management, resource management, and others [7; 11]. This indicates the effectiveness and objectivity of the method.

However, if a relatively large number of factors are included in the model, then during the construction of matrices of pairwise comparisons there may be problems of their evaluation on the Saati scale: this is due to the fact that it is difficult for an ordinary person to make a rational choice if the number of objects of choice exceeds  $7 \pm 2$  [11]. In addition, some factors are not easy to compare among themselves (especially to a person who has little practical experience). Therefore, Nikul E.S. [7] proposed a modification of the Saati method, which consists in the fact that instead of Saati's estimates in the matrix of pairwise comparisons; numerical ratios of the corresponding characteristics of the model factors are recorded. In this case, the results obtained by the classical Saati method and the modified method, differ in their statistical error.

Proceeding from the foregoing, to construct our model we will use the modification of the Saati method [7], singling out, similar to the four levels of the hierarchy (Fig. 1):

— the first level is the focus of the hierarchy. At this stage, the task is formed, the purpose of the study is to identify the most competitive banking services;

— the second level is the group of factors that directly affect the achievement of the goal. In this case, each group of factors is represented as the summit in the constructed hierarchy, which is connected to the top of the first level. In the hierarchical structure of the choice of a commercial bank with the highest level of service competitiveness (the «Credit» service is selected in the research), which is determined by the integral indicator of the first level, which is based on the main factors placed on the second level: consumer (qualitative) properties and economic (cost) characteristics of banking services from the standpoint of the consumer;

— the third level — the individual characteristics of the groups of indicators. Identification of the most significant characteristics forms the task for which bank experts determine the factors affecting the attractiveness of banking services for the consumer, on which the heights of the second level depend.

— the fourth level — alternatives. At this stage, the assessment and selection of the most competitive banking services from the submitted sample of commercial banks is being carried out (for the study, we choose six «banks» from three banking groups: JSC Oschadbank, PJSC CB «Privatbank», JSC «Raiffeisen Bank Aval», JSC «Kredobank», JSC «Alfabank» and PJSC CB «Taskombank»).

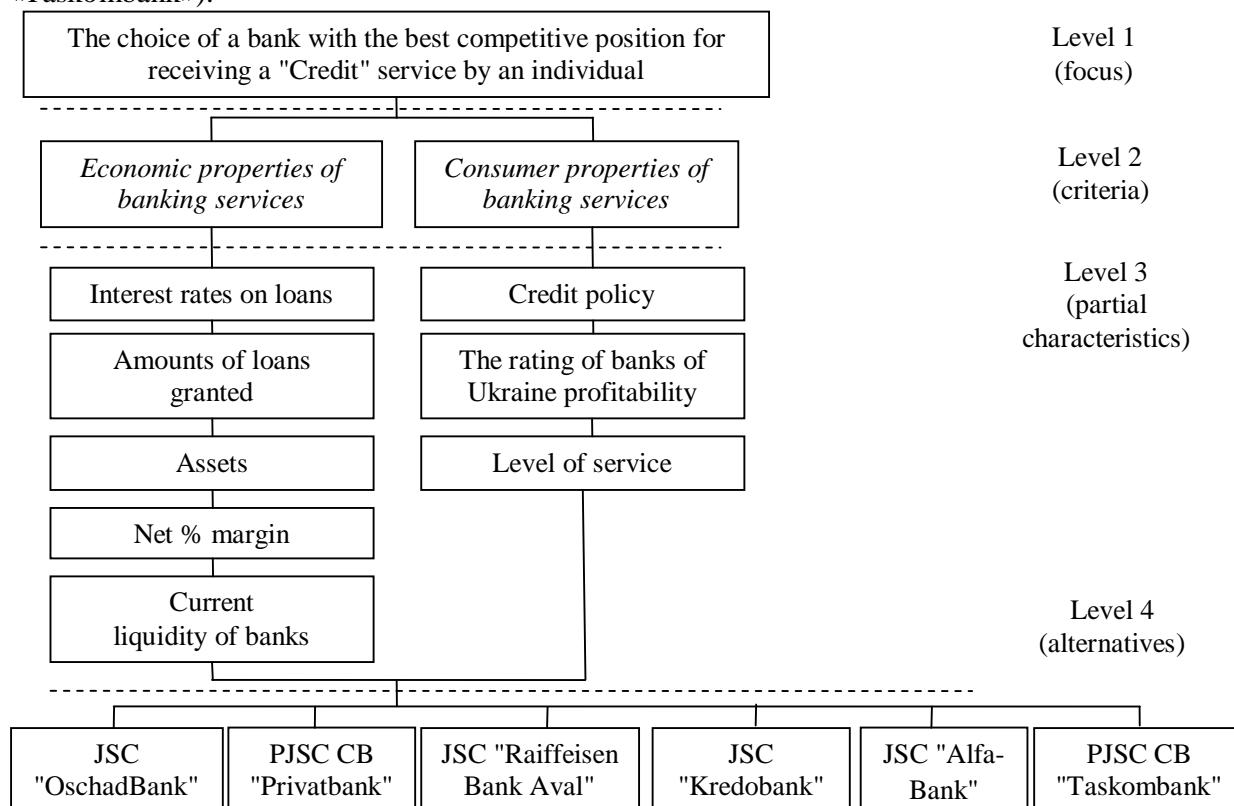


Fig. 1. Levels of model hierarchy

Source: Created by authors

Input statistics on model factors are based on the official reporting of the investigated commercial banks. According to these data, the corresponding mean values (Annex 1) were calculated and their normalization (Annex 2) was calculated. It is these normalized data that will be used as numerical estimates of the model's factors.

The next stage of the presented model is the construction of a matrix of pairwise comparisons of the criteria of the second level of the hierarchy (Table 1).

Table 1

The matrix of pairwise comparisons for elements of level 2

Properties	Consumer properties	Economic properties	Medium geometric	The normalized vector of priorities $V_{pr}$
Consumer properties	1	0,5	0,70711	0,333333
Economic properties	2	1	1,41421	0,666667
SUM	3	1,5	2,12132	1

$\lambda_{\max}=2,000000324, IV=0, VY=0.$

Source: own calculations by the authors

The  $VY < 10\%$  index  $< 10\%$  indicates the logic of judgments when filling matrices of pairwise comparisons, and therefore, the obtained data can be used in further modeling.

The next step is to calculate matrices of pairwise comparisons for elements of the third and fourth level of the hierarchy. Each of these matrices  $V^{(c)}$  is formed:

$$V^{(c)} = (b_{ij}^{(c)}), i, j = \overline{1; n}, b_{ii}^{(c)} = 1, \quad (1)$$

where for each of the matrices all diagonal elements are equal to units  $i = \overline{1, n}$ .  
 For each of the matrices there are the following characteristics:

— normalized vector,  $V_c = (\beta_1^{(c)}, \beta_2^{(c)}, \dots, \beta_n^{(c)})$ , where 
$$\beta_i^{(c)} = \frac{\sqrt[n]{\prod_{j=1}^n b_{ij}^{(c)}}}{\sum_{i=1}^n \sqrt[n]{\prod_{j=1}^n b_{ij}^{(c)}}}, j = \overline{1, n};$$

— the most significant value: 
$$\lambda_{\max} = \sum_{j=1}^n \left( \sum_{i=1}^n [b_{ij}^{(c)}] \right) \beta_j^{(c)} ;$$

— index of consistency: 
$$IY = \frac{\lambda_{\max} - n}{n - 1} ;$$

— coherence ratio:  $VY = \frac{IY}{TIY}$ , where  $TIY$  — is the table value of the index of consistency for the matrix of a given size. For the Saat hierarchy analysis method, it is assumed that the matrix is consistent (that is, suitable for simulation) if the value of  $VY < 10\%$ , that is,  $VY < 0,1$  [12, p. 85]. Matrices of pairwise comparisons are shown in Table. 2.

Table 2

The matrix of pairwise comparisons of consumer factors

Consumer factors	Credit policy	The rating of banks of Ukraine NBU profitability	Level of service	Medium geometric	The normalized vector of priorities, $V_c$
Credit policy	1	1,3893899	1,1195962	1,15867558	0,378669
The rating of banks of Ukraine NBU profitability	0,71974037	1	0,8058186	0,84837513	0,277259
Level of service	0,89317915	1,24097408	1	1,05281156	0,344072
$\lambda_{\max}= 3,00253616, IY=0,00126808, VY=0,00218634$					

Source: own calculations by the authors

This means that the factor «Service level» is the most important in the group of consumer factors, and the factor «Rating of Ukrainian banks by NBU on profitability» is the least significant.

By analogy, the matrix of pairwise comparisons of economic factors received a normalized vector of priorities:

$$V_{ef} = (0,29 \ 0,11 \ 0,12 \ 0,21 \ 0,28)^T. \quad (2)$$

The analysis of this components shows that in the group of economic factors, the factor «Interest rates on loans» is the most important, and the least important is «Volume of loans granted» (Table 3).

For a matrix of pairwise comparisons of alternatives on the factor «Credit Policy» received a normalized vector of priorities:

$$V_{1^*T} = (0,14778518 \ 0,18228146 \ 0,16111329 \ 0,15680125 \ 0,18188946 \ 0,17012936$$

The components of this vector are almost the same, that is, the credit policy in all investigated banks is not significantly different. Privatbank and Alfabank share the first position, while Oschadbank is the last.

By analogy, for the matrix of pairwise comparisons of alternatives with respect to the factor «Rating of Ukrainian banks by NBU for profitability», the normalized vector of priorities was obtained:  $V_2 = (0,17 \ 0,32 \ 0,17 \ 0,09 \ 0,10 \ 0,15)^T$ . The largest components of this vector corresponds to the bank «Privatbank», while the smallest share is between «Kredobank» and «Alfabank».

Table 3

The matrix of pairwise comparisons of alternatives relative factor «Credit policy»

Credit policy	JSC «Oschadbank»	PJSC CB «Privatbank»	JSC «Raiffeisen Bank Aval»	JSC «Kredobank»	JSC «Alfabank»	PJSC CB «Taskombank»	The normalized vector of priorities, $V_I$
JSC «Oschadbank»	1	0,81075269	0,91727494	0,9425	0,8125	0,86866359	0,147785
PJSC CB «Privatbank»	1,23342175	1	1,13138686	1,1625	1,00215517	1,07142857	0,182281
JSC «Raiffeisen Bank Aval»	1,09018568	0,88387097	1	1,0275	0,88577586	0,94700461	0,161113
JSC «Kredobank»	1,06100796	0,86021505	0,97323601	1	0,86206897	0,92165899	0,156801
JSC «Alfabank»	1,23076923	0,99784946	1,12895377	1,16	1	1,06912442	0,181889
PJSC CB «Taskombank»	1,15119363	0,93333333	1,05596107	1,085	0,93534483	1	0,170129
$\lambda_{\max} = 6; IV=0,00; VY=0,00.$							

Source: own calculations by the authors

For the matrix of pairwise comparisons of alternatives with respect to the «Service Level» factor, the normalized vector of priorities looks like:  $V_3 = (0,18 \ 0,18 \ 0,18 \ 0,15 \ 0,16 \ 0,14)^T$ , that is, in terms of service, all investigated banks are almost identical.

The normalized vector of priorities for the matrix of pairwise comparisons of alternatives relative to the factor «Interest rates on loans» looks like:  $V_4 = (0,19 \ 0,15 \ 0,16 \ 0,17 \ 0,17 \ 0,16)^T$ . The analysis of the component of the vector  $B_4$  shows that, with regard to the proposal on interest rates on loans from investigated banks, «Oschadbank» is allocated, the rest have almost identical suggestions.

The normalized vector of priorities for the matrix of pairwise comparisons of alternatives with respect to the factor «Amounts of granted loans» looks like:  $V_5 = (0,24 \ 0,52 \ 0,12 \ 0,01 \ 0,09 \ 0,01)^T$ . The largest component of the vector  $B_5$  (respectively, the best result in terms of loans provided) corresponds to PrivatBank, and the smallest — Taskombank.

For a matrix of pairwise comparisons of alternatives relative to the factor «Assets of the Bank», the normalized vector of priorities has the form:  $V_6 = (0,29 \ 0,48 \ 0,13 \ 0,02 \ 0,08 \ 0,01)^T$ . The analysis of the component of the vector shows that the highest position in relation to the factor «Assets of the bank» in Privatbank, the lowest — in Tascombank.

The normalized vector of priorities for the matrix of pairwise comparisons of alternatives relative to the factor «Netinterest margin» has the form:  $V_7 = (0,15 \ 0,13 \ 0,27 \ 0,16 \ 0,16 \ 0,13)^T$ . Its components show that Raiffeisen Bank Aval holds the highest position in terms of net interest margin, and the lowest is Taskombank.

For the last of the matrices of pairwise comparisons of alternatives, the normalized priority vector has the form:  $V_8 = (0,18 \ 0,16 \ 0,16 \ 0,15 \ 0,20 \ 0,14)^T$ . As can be seen, according to the level of current liquidity of banks, Alfabank and Oschadbank are somewhat highlighted, while the remaining banks occupy roughly the same positions.

The next step of research is to create the vector of global priorities for the consumer factors:

$$V_{cf}^G = (V_1 V_2 V_3) * V_{cf}, \quad (3)$$

where the matrix  $(V_1 V_2 V_3)$  is formed from the components of the normalized priority vectors  $V_1, V_2$  та  $V_3$ , namely: components of the vector  $V_1$  form the first column of the matrix,

components  $V_2$  – are the second column, and components  $V_3$  – are the third column of the matrix. We have:

$$V_{ef}^G = \begin{pmatrix} 0,14778518 & 0,17114879 & 0,18181818 \\ 0,18228146 & 0,32185597 & 0,18181818 \\ 0,16111329 & 0,16969897 & 0,18181818 \\ 0,15680125 & 0,09207361 & 0,15151515 \\ 0,18188946 & 0,09503498 & 0,16161616 \\ 0,17012936 & 0,15018768 & 0,14141414 \end{pmatrix} * \begin{pmatrix} 0,37866919 \\ 0,27725926 \end{pmatrix} = \begin{pmatrix} 0,16597274 \\ 0,22082038 \\ 0,17061771 \\ 0,13703612 \\ 0,15083279 \\ 0,15472026 \end{pmatrix}.$$

The analysis of the component of the vector of global priorities with respect to consumer factors shows that Privatbank takes the first position on consumer priorities among the six banks under consideration, the latter is Kredobank.

Next, a vector of global priorities with respect to economic factors is calculated:

$$V_{ef}^G = (V_4 V_5 V_6 V_7 V_8) * V_{ek}, \quad (4)$$

where the matrix  $(V_4 V_5 V_6 V_7 V_8)$  is formed from the components of the normalized priority vectors  $V_4 - V_8$ . We have:

$$V_{ef}^G = \begin{pmatrix} 0,18809098 & 0,24031183 & 0,29282254 & 0,15282624 & 0,18068193 \\ 0,14707386 & 0,52166719 & 0,4766331 & 0,1311933 & 0,16448314 \\ 0,15946844 & 0,12427355 & 0,12557063 & 0,26552687 & 0,16180241 \\ 0,17339637 & 0,01308464 & 0,01515271 & 0,16434054 & 0,15396428 \\ 0,16943522 & 0,09117378 & 0,08120923 & 0,1577111 & 0,19916929 \\ 0,16253514 & 0,00948902 & 0,0086118 & 0,12840195 & 0,13989894 \end{pmatrix} * \begin{pmatrix} 0,29343343 \\ 0,1057996 \\ 0,11579595 \\ 0,20785912 \\ 0,2771119 \end{pmatrix} = \begin{pmatrix} 0,19636018 \\ 0,22639071 \\ 0,17451159 \\ 0,13084428 \\ 0,15674168 \\ 0,11515157 \end{pmatrix}$$

Components of the vector of global priorities with respect to economic factors indicate that the most attractive for a set of economic factors included in the model is Privatbank, the least attractive — Taskombank.

The final step of synthesis is to calculate the priority alternatives vector relative to the focus of the groups:

$$V_{focus} = (V_r^G V_{ek}^G) * V_{pr} * 100. \quad (5)$$

Substituting computed earlier components, we get the final result:

$$V_{focus} = \begin{pmatrix} 0,16597274 & 0,19636018 \\ 0,22082038 & 0,22639071 \\ 0,17061771 & 0,17451159 \\ 0,13703612 & 0,13084428 \\ 0,15083279 & 0,15674168 \\ 0,15472026 & 0,11515157 \end{pmatrix} * \begin{pmatrix} 0,33333333 \\ 0,66666667 \end{pmatrix} * 100 = \begin{pmatrix} 18,623104 \\ 22,453393 \\ 17,321363 \\ 13,290823 \\ 15,477205 \\ 12,834113 \end{pmatrix}.$$

As result, we get a visual representation of the level of competitiveness of banking services of the six banks under consideration for 2010—2017 years.

Based on the calculated priority value for each of the alternatives, we can conclude that the most competitive banking service for obtaining a loan among the commercial banks in Ukraine is the banking service provided by PJSC CB «Privatbank».

Lower level of credit service competitiveness in JSC «Oschadbank», JSC «Raiffeisen Bank Aval», JSC «Alfa-Bank», JSC «Kredobank» and PJSC CB «Taskombank».

By organizing the components of the resulting vector in descending order, we obtain the rating of the banks under consideration by the level of competitiveness of the banking service (Fig. 2).



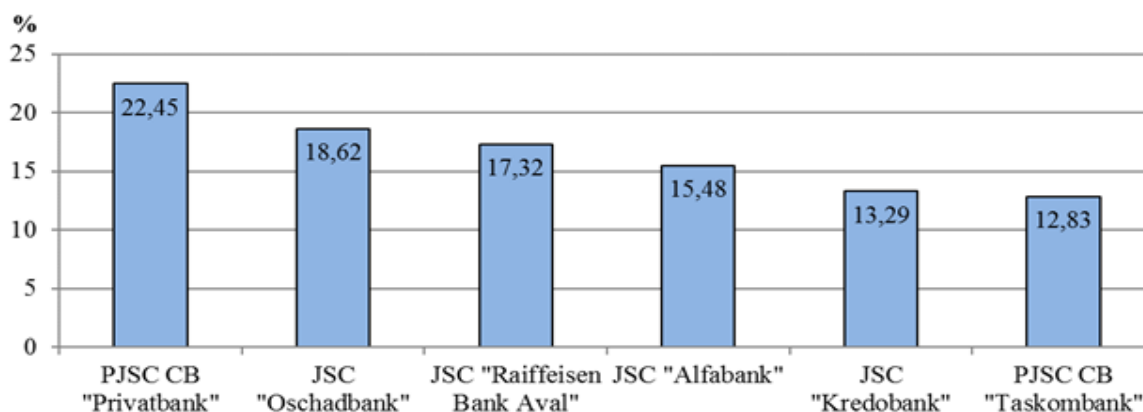


Fig. 2. Ranged level of competitiveness of the banking service «Credit» for 2010-2017 years

Source: Created by authors

As a result of analysis of the investigated service «Credit» for each commercial bank it is possible to establish its position and competitive advantages in comparison with similar service of other commercial banks. It is proposed to allocate a banking service-leader, outsider, standard and ideal. Banking service-leader of a commercial bank — is the most competitive banking service of a certain commercial bank in relation to the services studied by other commercial banks.

Bank service-outsider — the most unattractive banking service of a certain bank for the consumer in comparison with similar banking services of other commercial banks. This banking service is characterized by a low level of competitiveness compared with the corresponding services of other commercial banks.

The standard banking service is a service that serves as a benchmark for the estimated banking service with which the comparison is performed. As a result of information synthesis, a hypothetical banking service is created as a ideal for the existing banking service of a particular commercial bank, and makes adjustments to the policy of managing the provision of services by banking institutions.

**Conclusions.** The results of the analysis showed that in order to form effective management decisions and take practical steps to increase the competitiveness of the banking institution, an assessment of the level of competitiveness of banking services is necessary. In this regard, we use the method of analysis of hierarchies among methods of estimation, which allows us to translate the qualitative values of indicators into quantitative ones in order to obtain the indicator of competitiveness of banking services.

This method allows us to snap around the level of competitiveness of the banking service «Credit» of six domestic banks. According to the results of the evaluation, the objects-reference points were proposed, which in the future would allow to form competitive advantages and positions on this basis for implementation of effective policy of provision of high-quality banking services and management of banking business processes in the period of dynamism of the market environment.

**Annex 1.** The average values of the model factors for 2010-2017

Characteristic	JSC «Oschadbank»	PJSC CB «Privatbank»	JSC «Raiffeisen Bank Aval»	JSC «Kredobank»	JSC «Alfabank»	PJSC CB «Taskombank»
<b>Economic properties</b>						
Interest rates on loans	21,03	16,44	17,83	19,39	18,94	18,17
Amounts of loans granted	56814669	123332874	29380827	3093478	21555360	22433399
Assets	117163374	190709167	50242985	6062862	32493222	3445729
Net interest margin	6,26	5,37	10,87	6,73	6,46	5,26
Current liquidity of banks	83,48	76,00	74,76	71,14	92,02	64,64
<b>Consumer properties</b>						
Credit policy	0,54	0,66	0,59	0,57	0,66	0,62
The rating of Ukrainian banks NBU for profitability	0,2895	0,1539	0,2920	0,5381	0,5214	0,3299
Level of service	0,9	0,9	0,9	0,75	0,8	0,7

Source: own calculations by authors on the basis of [8]

73

**Annex 2.** Normalized values of model factors for 2010-2017 years

Characteristic	JSC «Oschadbank»	PJSC CB «Privatbank»	JSC «Raiffeisen Bank Aval»	JSC «Kredobank»	JSC «Alfabank»	PJSC CB «Taskombank»
<b>Economic properties</b>						
Interest rates on loans	0,18809098	0,14707386	0,15946844	0,17339637	0,16943522	0,16253514
Amounts of loans granted	0,24031183	0,52166719	0,12427355	0,01308464	0,09117378	0,00948902
Assets	0,29282254	0,4766331	0,12557063	0,01515271	0,08120923	0,0086118
Net interest margin	0,15282624	0,1311933	0,26552687	0,16434054	0,1577111	0,12840195
Current liquidity of banks	0,18068193	0,16448314	0,16180241	0,15396428	0,19916929	0,13989894
<b>Consumer properties</b>						
Credit policy	0,14778518	0,18228146	0,16111329	0,15680125	0,18188946	0,17012936
The rating of Ukrainian banks NBU for profitability	0,17114879	0,32185597	0,16969897	0,09207361	0,09503498	0,15018768
Level of service	0,18181818	0,18181818	0,18181818	0,15151515	0,16161616	0,14141414

Source: own calculations by authors on the basis of [8]

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