

DECISION MAKING WHEN CHOOSING AN OPTIMAL PERSONAL BANK ACCOUNT BASED ON A MULTICRITERIAL ACCOUNT EVALUATION MODEL

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1. Introduction

When choosing a bank account, all available offers and the conditions offered by the banks should be analysed. People who already have accounts rarely change the bank. However, sometimes unsatisfactory issues happen in cooperation with a given bank, which somewhat "forces" the customer to take steps to start the process of searching for a new option. Banks not only advertise terms for their customers but also try to outdo each other in offers designed to attract new customers: whether they have resigned from cooperation with another bank or they open a personal account for the first time, e.g. as a result of their first job. It seems reasonable to create a model that helps in selection of a new account that best reflects the expectations of a potential new customer.

The purpose of the study is to make a comparative analysis of the 12 most popular personal accounts proposed by banks. The criteria are the most important points which potential clients take into consideration:

1. Initial fee when opening an account.
2. Account maintenance fee:
 - free,
 - free with the condition of making a certain number of transactions,
 - free with the condition of making a transaction for a specific amount,
 - free with the condition of making a deposit of a certain amount in the previous month,
 - free for customers under a certain age.

3. Card fee:
 - free,
 - free with the condition of making a certain number of transactions,
 - free with the condition of making a transaction for a specific amount,
 - free with the condition of making a deposit of a certain amount in the previous month,
 - free for customers under a certain age.
4. Fees for using cash machines:
 - all cash machines free of charge,
 - fees for using other banks' cash machines,
 - fees for using banks' services abroad.
5. Additional options:
 - Apple Pay,
 - Google Pay,
 - Blik
 - Cashback.
6. Account opening bonus.
7. Special interest rates on deposits.

Below, tables (1-3) present offers of 12 banks regarding personal bank accounts for new customers.

2. Multicriterial analysis model

Coping with the search for an optimal solution, when dealing with multiple criteria, various methods can be used (Trzaskalik, 2006, Stadnicki, 2006). This paper presents one of the possibilities of solving the problem based on the hierarchical structure of criteria, taking into account the importance of criteria.

In the presented model, 12 bank accounts belonging to the finite set B are analysed:

$$B = \{B_1, B_2, \dots, B_i, \dots, B_{12}\}, \quad i = 1, \dots, 12, \quad (1)$$

The criteria presented in point 1 of the paper form a two-level hierarchical structure.

The variable V_i is adopted in the paper, determining the importance of assessments against Level 1 criteria:

$$\sum_{i=1}^7 V_i = 1. \quad (2)$$

The importance of Level 2 criteria is described by the variable V_{lm} (m - Level 2 criterion).

$$\sum_m V_{lm} = 1. \quad (3)$$

Table 1.

Statement of fees related to the opening and maintenance of the account and fees related to the card

	Account opening fee	Account maintenance fee if conditions are not met	Free account maintenance with a certain number of transactions	Free account maintenance with a specific deposit made into the account	Free account maintenance for customers under a certain age	Card fee if conditions are not met	Required transaction amount for a free card	Number of transactions required for a free card
Konto Direct – ING Bank Śląski eKonto standard - mBank	0	0	0	0	0	7	300	0
eKonto standard - mBank	0	0	5	0	0	4	0	0
Nest Account – Nest Bank	0	0	0	0	0	0	0	0
Konto Proste Zasady – Getin Bank	0	8	1	0	0	0	0	0
Konto Optymalne – PNB Paribas	0	0	0	0	0	0	0	0
Millenium	0	8	1	1,000	0	0	0	0
Konto dla Ciebie – Credit Agricole	0	0	0	0	0	0	0	0
Konto na Zero – PKO BP	0	6.9	0	0	0	6.9	300	0
Konto Jakże Osobiste – Alior Bank	0	10	0	1,500	26	10	300	0
Konto Freemium - T-mobile Usługi Bankowe	0	0	0	0	0	6	200	0
Konto Jakie Chcesz – Santander Bank Polska	0	0	0	0	0	5	0	5
Konto Bez Granic – PKO BP	17.9	0	0	0	0	0	0	0

Note: own study based on: <https://www.rankingkontosobistych.pl/konta-osobiste>.

Table 2.*Statement of costs of withdrawals from cash machines of different banks or cash machines abroad*

	The cost of withdrawing from cash machines of different banks when the conditions are not met	Free withdrawal from cash machines of different banks upon authorization by Blik	Free withdrawal when a certain deposit was made	Number of transactions for free withdrawal	Withdrawal from cash machines of different banks%	Number of free withdrawals from cash machines of different banks	The cost of withdrawals from cash machines abroad when the conditions are not met	The cost of withdrawals from cash machines abroad %	Free withdrawal on payment to the account of a certain amount	Number of transactions for free withdrawal	Number of free withdrawals abroad
Konto Direct – ING Bank Śląski	2.5	0	0	0	0	0	0	3%	0	0	1
eKonto standard - mBank	7	0	0	0	0	0	10 zł	5.90%	0	0	0
Nest Account – Nest Bank	0	0	0	0	0	0	5 zł	3%	0	0	0
Konto Proste Zasady – Getin Bank	0	0	0	0	0	0	10 zł	4.50%	0	0	0
Konto Optymalne – PNB Paribas	5	0	0	0	0	0	10 zł	0	0	0	0
Millenium	5	0	1,000	1	0	0	9	2.50%	1,000	1	0
Konto Dla Ciebie – Credit Agricole	5	0	1,000	1	0	0	10	0	0	0	0
Konto Na zero – PKO BP	5	0	0	0	3%	0	10	3%	0	0	0
Konto Jakże Osobiste – Alior Bank	2.50	0	0	0	0	0	5 zł	0	0	0	0

Cont. table 2.

Konto Freemium - T-mobile usługi Bankowe	6	0	0	0	0	3	6	0	0	3	3
Konto Jakie Chcę - Santander Bank Polska	5	1	0	0	0	0	10	2.50%	0	0	0
Konto Bez Granic – PKO BP	0	0	0	0	0	0	0	0	0	0	0

Note: own study based on: <https://www.rankingkontosobistych.pl/konta-osobiste>.

Table 3.*Options availability statement*

	Apple Pay	Google Pay	Blik	Cashback	Maximum bonus for setting up an account [zł]	Special deposit %
Konto Direct – ING Bank Śląski	Yes	Yes	Yes	No	140	2.5
eKonto standard – mBank	Yes	Yes	Yes	Yes	140	0
Nest Account – Nest Bank	Yes	Yes	No	No	0	4
Konto Proste Zasady – Getin Bank	Yes	Yes	Yes	Yes	0	3.5
Konto Optymalne – PNB Paribas	Yes	Yes	Yes	Yes	300	0
Millenium	Yes	No	Yes	No	0	2.7
Konto Dla Ciebie – Credit Agricole	Yes	Yes	Yes	Yes	300	0
Konto Na Zero – PKO BP	Yes	No	Yes	Yes	0	0
Konto Jakże Osobiste – Alior Bank	Yes	Yes	Yes	Yes	0	0
Konto Freemium – T-mobile Usługi Bankowe	Yes	Yes	Yes	No	0	0
Konto Jakie Chcę – Santander Bank Polska	Yes	Yes	Yes	Yes	0	0
Konto Bez Granic – PKO BP	Yes	Yes	Yes	Yes	0	0

Note: own study based on <https://www.rankingkontosobistych.pl/konta-osobiste>.

At the beginning of the assessment process, we standardise assessments by the following formula:

- a) for the criteria against which the optimisation comes down to searching for the maximum value:

$$K'_{ilm} = \frac{K_{ilm}}{\max K_{ilm}}, \quad (4)$$

- b) for the criteria against which the optimisation comes down to the search for a minimum value:

$$K'_{ilm} = 1 - \frac{K_{ilm}}{\max K_{ilm}}. \quad (5)$$

Based on standardised assessments, the first stage of the analysis can begin, i.e., specifying cumulative assessments against Level 2 criteria:

$$K'_{il} = \frac{\sum_m V_m \cdot K'_{ilm}}{\sum_m V_m}. \quad (6)$$

After determining the level 2 assessments, we normalise again according to the following formulas:

- a) for criteria: additional options, bonus for opening an account, promotional interest on deposits:

$$K_{il} = \frac{K'_{il}}{\max K'_{il}}, \quad (7)$$

- b) for the criteria: initial payment when opening an account, account maintenance fee, card fee, fees for using cash machines:

$$K_{il} = 1 - \frac{K'_{il}}{\max K'_{il}}. \quad (8)$$

After normalisation, the next stage of the analysis is to determine cumulative assessments against Level 1 criteria:

$$K'_i = \frac{\sum_l V_l \cdot K'_{il}}{\sum_l V_l}. \quad (9)$$

Due to the adopted normalisation method (formulas (4)-(5) and (7)-(8)), the model strives for the maximum assessment, which indicates the bank account best suited to the needs:

$$K_i \rightarrow MAX \quad (10)$$

3. The results of the analysis of bank accounts

Based on the presented in the study in point 2 work of the model for multicriterial assessment of bank accounts, the proposed offers were evaluated. The calculations assume the same level of criteria importance, but the model assumes the possibility of determining different weights for individual criteria. The reason why the equal weights were adopted is that depending on the expectations of potential customers, the weights would have different values. And although creating a pattern of behaviour of groups of new customers could be tempting, this is not the subject of this work.

According to the algorithm, the first step is the normalisation of assessments. They are presented in the tables 4-6.

Table 4.*Normalised assessment values for account opening, account maintenance and card*

	Fee for opening an account	Account maintenance fee if conditions are not met	Free account maintenance with a certain number of transactions	Free account maintenance with a specific deposit made into the account	Free account maintenance for customers under a certain age	Card fee if conditions are not met	Required transaction amount for a free card	Number of transactions required for a free card
KontoDirect – ING Bank Śląski	1.00	1.00	1.00	1.00	1.00	0.30	0.00	1.00
eKonto standard – mBank	1.00	1.00	0.00	1.00	1.00	0.60	1.00	1.00
Nest Account – Nest Bank	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Konto Proste Zasady – Getin Bank	1.00	0.20	0.80	1.00	1.00	1.00	1.00	1.00
Konto Optymalne – PNB Paribas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Millenium	1.00	0.20	0.80	0.33	1.00	1.00	1.00	1.00
Konto Dla Ciebie – Credit Agricole	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Konto Na Zero – PKO BP	1.00	0.31	1.00	1.00	1.00	0.31	0.00	1.00
Konto Jakże Osobiste – Alior Bank	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Konto Freemium – T-mobile Usługi Bankowe	1.00	1.00	1.00	1.00	1.00	0.40	0.33	1.00
Konto Jakie Chcę – Santander Bank Polska	1.00	1.00	1.00	1.00	1.00	0.50	1.00	0.00
Konto Bez Granic – PKO BP	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Note: own study.

Table 5.
Normalised cost values for cash machines withdrawals

	The cost of withdrawing from cash machines of different banks when the conditions are not met	Free withdrawal from cash machines of different banks upon authorization by Blik	Free withdrawal when a certain deposit was made into the account	Number of transactions for free withdrawal	Withdrawal from cash machines of different banks %	Number of free withdrawals from cash machines of different banks	The cost of withdrawals from ATMs abroad when the conditions are not met	Cash machines withdrawals abroad %	Free withdrawal when a certain deposit was made into the account	Number of transactions for free withdrawal	Number of free withdrawals abroad
Konto Direct – ING Bank Śląski	0.64	1.00	1.00	1.00	1.00	1.00	1.00	0.49	1.00	1.00	0.67
eKonto standard – mBank	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Nest Account – Nest Bank	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.49	1.00	1.00	1.00
Konto Proste Zasady – Getin Bank	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.24	1.00	1.00	1.00
Konto Optymalne – PNB Paribas	0.29	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Millenium	0.29	1.00	0.00	0.00	1.00	1.00	0.10	0.58	0.00	0.67	1.00
Konto Dla Ciebie – Credit Agricole	0.29	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Konto Na Zero – PKO BP	0.29	1.00	1.00	1.00	0.00	1.00	0.00	0.49	1.00	1.00	1.00
Konto Jakże Osobiste – Alior Bank	0.64	1.00	1.00	1.00	1.00	1.00	0.50	1.00	1.00	1.00	1.00
Konto Freemium – T-mobile Usługi Bankowe	0.14	1.00	1.00	1.00	1.00	0.00	0.40	1.00	1.00	0.00	0.00

Cont. table 5.

Konto Jakie Chcę – Santander Bank Polska	0.29	0.00	1.00	1.00	1.00	1.00	0.00	0.58	1.00	1.00	1.00
Konto Bez Granic – PKO BP	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Note: own study.

Table 6.

Normalised assessment values for additional options, account opening bonuses and promotional deposits

	Apple Pay	Google Pay	Blik	Cashback	Maximum bonus for setting up an account	Promotional deposit %
Konto Direct – ING Bank Śląski	1.00	1.00	1.00	0.00	0.47	0.63
eKonto standard - mBank	1.00	1.00	1.00	1.00	0.47	0.00
Nest Account – Nest Bank	1.00	1.00	0.00	0.00	0.00	1.00
Konto Proste Zasady – Getin Bank	1.00	1.00	1.00	1.00	0.00	0.88
Konto Optymalne – PNB Paribas	1.00	1.00	1.00	1.00	1.00	0.00
Millenium	1.00	0.00	1.00	0.00	0.00	0.68
Konto Dla Ciebie – Credit Agricole	1.00	1.00	1.00	1.00	1.00	0.00
Konto Na Zero – PKO BP	1.00	0.00	1.00	1.00	0.00	0.00
Konto Jakże Osobiste – Alior Bank	1.00	1.00	1.00	1.00	0.00	0.00
Konto Freemium – T-mobile Banking services	1.00	1.00	1.00	0.00	0.00	0.00
Konto Jakie Chcę – Santander Bank Polska	1.00	1.00	1.00	1.00	0.00	0.00
Konto Bez Granic – PKO BP	1.00	0.00	1.00	1.00	0.00	0.00

Note: own study.

The table below presents the values of the weights of individual criteria.

Table 7.

Values of accepted weights

Weight	Weight value	Weight	Weight value	Weight	Weight value	Weight	Weight value
V ₁	0.14	V ₄	0.14	V ₅	0.14	V ₆	0.14
V ₂	0.14	V ₄₁	0.17	V ₅₁	0.2	V ₆₁	0.25
V ₂₁	0.25	V ₄₁	0.17	V ₅₂	0.2	V ₆₂	0.25
V ₂₂	0.25	V ₄₃	0.17	V ₅₃	0.2	V ₆₃	0.25
V ₂₃	0.25	V ₄₄	0.17	V ₅₄	0.2	V ₆₄	0.25
V ₂₄	0.25	V ₄₅	0.17	V ₅₅	0.2	V ₇	0.14

Cont. table 7.

V ₃	0.14	V ₄₆	0.17				
V ₃₁	0.33						
V ₃₂	0.33						
V ₃₃	0.33						

Note: own study.

Based on the total assessment against Level 2 criteria, total assessment of bank accounts was obtained, broken down into Level 1 criteria – the results are presented in Table 8.

Table 8.

Weighted assessments against Level 1 criteria

	Fee for opening an account	Weighted assessment of fee for account maintenance	Weighted assessment of fee for card	Weighted assessment of fee for cash machine withdrawal from different banks	Weighted assessment of fee for cash machine withdrawal abroad	Weighted assessment of additional options	Bonus for account opening	Promotional deposit
Konto Direct – ING Bank Śląski	1.00	1.00	0.43	0.94	0.83	0.75	0.47	0.63
eKonto standard - mBank	1.00	0.75	0.87	0.83	0.60	1.00	0.47	0.00
Nest Account – Nest Bank	1.00	1.00	1.00	1.00	0.80	0.50	0.00	1.00
Konto Proste Zasady – Getin Bank	1.00	0.75	1.00	1.00	0.65	1.00	0.00	0.88
Konto Optymalne – PNB Paribas	1.00	1.00	1.00	0.88	0.80	1.00	1.00	0.00
Millenium	1.00	0.75	1.00	0.55	0.47	0.50	0.00	0.68
Konto Dla Ciebie – Credit Agricole	1.00	1.00	1.00	0.55	0.80	1.00	1.00	0.00
Konto Na Zero – PKO BP	1.00	0.83	0.44	0.71	0.70	0.75	0.00	0.00
Konto Jakże Osobiste – Alior Bank	1.00	0.75	0.33	0.94	0.90	1.00	0.00	0.00
Konto Freemium - T-mobile Usługi Bankowe	1.00	1.00	0.58	0.69	0.48	0.75	0.00	0.00

Cont. table 8.

Konto Jakie Chcę - Santander Bank Polska	1.00	1.00	0.50	0.71	0.72	1.00	0.00	0.00
Konto Bez Granic – PKO BP	0.00	1.00	1.00	1.00	1.00	0.75	0.00	0.00

Note: own study.

The next step is to normalise the cumulative assessment against Level 1 criteria, as shown in Table 9.

Table 9.

Standardised assessments against Level 2 criteria

	Fee for opening an account	Weighted assessment of fee for account maintenance	Weighted assessment of fee for card	Weighted assessment of fee for cash machine withdrawal from different banks	Weighted assessment of fee for cash machine withdrawal abroad	Weighted assessment of additional options	Bonus for account opening	Promotional deposit
Konto Direct – ING Bank Śląski	1.00	1.00	0.43	0.94	0.83	0.75	0.47	0.63
eKonto standard - mBank	1.00	0.75	0.87	0.83	0.60	1.00	0.47	0.00
Nest Account – Nest Bank	1.00	1.00	1.00	1.00	0.80	0.50	0.00	1.00
Konto Proste Zasady – Getin Bank	1.00	0.75	1.00	1.00	0.65	1.00	0.00	0.88
Konto Optymalne – PNB Paribas	1.00	1.00	1.00	0.88	0.80	1.00	1.00	0.00
Millenium	1.00	0.75	1.00	0.55	0.47	0.50	0.00	0.68
Konto dla Ciebie – Credit Agricole	1.00	1.00	1.00	0.55	0.80	1.00	1.00	0.00
Konto Na Zero – PKO BP	1.00	0.83	0.44	0.71	0.70	0.75	0.00	0.00
Konto Jakże Osobiste – Alior Bank	1.00	0.75	0.33	0.94	0.90	1.00	0.00	0.00
Konto Freemium - T-mobile Usługi Bankowe	1.00	1.00	0.58	0.69	0.48	0.75	0.00	0.00

Cont. table 9.

Konto Jakie Chce - Santander Bank Polska	1.00	1.00	0.50	0.71	0.72	1.00	0.00	0.00
Konto Bez Granic – PKO BP	0.00	1.00	1.00	1.00	1.00	0.75	0.00	0.00

Note: own study.

Taking into account the values of Level 1 criteria weights, total bank account assessments were obtained (results in Table 10). After normalising these ratings, there is a ranking presented according to the rating maximisation.

Table 10.

Summary of assessments and account ranking presentation

	Weighted assessments according to the global criterion	Normalised weighted assessment of universal criterion	Sorting according to the optimal choice
Konto Direct – ING Bank Śląski	0.775	0.812	1
eKonto standard - mBank	0.788	0.826	0.977
Nest Account – Nest Bank	0.757	0.793	0.883
Konto Proste Zasady – Getin Bank	0.771	0.808	0.872
Konto Optymalne – PNB Paribas	0.954	1.000	0.831
Millenium	0.609	0.639	0.807
Konto Dla Ciebie – Credit Agricole	0.907	0.950	0.765
Konto Na Zero – PKO BP	0.632	0.663	0.713
Konto Jakże Osobiste – Alior Bank	0.703	0.737	0.667
Konto Freemium – T-mobile Usługi Bankowe	0.643	0.673	0.665
Konto Jakie Chce – Santander Bank Polska	0.704	0.738	0.632
Konto Bez Granic – PKO BP	0.679	0.711	0.602

Note: own study.

Based on the proposed model, one can see which accounts (assuming the same value of criteria weights) are the most optimal. The highest rating received Konto Direct – ING Bank Śląski, eKonto standard - mBank also obtained a very high score, taking the 2nd position in the ranking. Konto Bez Granic received the lowest assessment – PKO BP. When analysing and interpreting the study it should be remembered that the result of the ranking could differ from that achieved when introducing changes in the weight values, which would better take into account the preferences of potential customers.

Summary

Nowadays, the development of the banking market is extensive. Competition makes banks outdo each other in gaining new customers. The more possibilities, the more pros or cons on the side of one or the other bank, the bigger the uncertainty about choosing a bank account. Depending on the age, the amount of money invested, the frequency of trips abroad, expectations concerning increasing one's banking finances, etc., the choice of the variant will be different. The paper proposes a multicriterial model enabling comparison of accounts taking into account different values of individual criteria. For the example of calculations, the same weights were assumed, not guided by any subjective preferences. This variant assumes that all criteria have the same impact on the customer's decision. Based on such assumptions, the ranking of bank accounts was determined. Of course, the selection of the optimal bank account can be expanded by including analysis of other methods used for multiple purposes.

References

1. Brett, K. (2013). *Bank 3.0. Nowy wymiar bankowości*. Warszawa: Wydawnictwo studio Emka.
2. Kesra, N. (2017). *Metody analizy wielokryterialnej i wielowymiarowej w podejmowaniu decyzji*. Warszawa: PWN.
3. Miklaszewska, E. (ed.). *Banki w nowym otoczeniu społecznym, gospodarczym i ekonomicznym*. Warszawa: Wydawnictwo Poltext.
4. Stadnicki, J. (2006). *Teoria i praktyka rozwiązywania zadań optymalizacyjnych*. Warszawa: WNT.
5. Świdarska, J., Klimontowicz, M., Galbarczyk, T. (2016). *Banki komercyjne w Polsce*. Warszawa: Difin.
6. Trzaskalik, T. (2006). *Metody wielokryterialne na polskim rynku finansowym*. Warszawa: PWE.