APPLYING THE ANALYTIC HIERARCHY PROCESS TO RANK CITY-BRANCHES

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Abstract: *The aim of the paper is to present developed AHP model for ranking city-branches of a bank. According to the number of active counters the city-branches of the bank are classified into the following three groups: group A with 1-3 active counters, group B with 2-5 active counters and group C with 4-9 active counters. The developed AHP model consists of a goal, criteria and alternatives. The goal is to rank the city-branches in the groups they belong to. The 8 criteria that are defined in the model are: denar savings, foreign currency savings, transaction accounts, exchange operations, public services, master cards, fees for payment operations (commission), and domestic payment operations. The alternatives are the city-branches that belong to each group. Developed AHP model is validated for ranking the city-branches of Commercial bank AD Skopje which are located in Skopje. The programming tool Super Decisions is used to implement the AHP model and the programming tool Expert Choice is used to perform sensitivity analysis. The obtained results are presented and analyzed in the paper.*

Key words*: multi-criteria decision-making, Analytic Hierarchy Process, ranking, sensitivity analysis, bank, city-branches*

1. INTRODUCTION

One of the key sectors that enable the economy to function is the banking sector. Banks play a vital role in the world's economy. They are authorized financial institutions that collect deposits and provide loans to individuals and legal entities, and they are largely responsible for the payment system. At the community level they do their activities through branches and city-branches.

This paper presents the applicability of the multi-criteria decision making method – the Analytic Hierarchy Process (AHP) to rank city-branches of a bank. The Analytic Hierarchy Process was developed by Thomas L. Saaty in the late seventies of the previous century (Saaty, 1977, 1980). It is designed to solve multi-criteria decision problems which can be decomposed into the following elements: goal, criteria, sub-criteria and alternatives. These elements are then structured in a hierarchy. The decision-maker makes a pair comparisons of the elements of each level of the hierarchy and provides judgments about the relative importance of each criterion regarding the goal, afterwards specifying a preference for each alternative regarding each of the criteria. The outputs of AHP are the weights of the criteria and the priorities of the alternatives. This method enables the quantitative and qualitative factors to be considered and it supports individual and group decision-making.

The AHP model for ranking the city-branches has been developed and validated on the case of one of the largest and most renowned banks in the Republic of Macedonia – Komercijalna Banka AD Skopje. The sample consists of the city-branches that are located in Skopje, while the analysis was made for 2011. In order to implement the AHP model and examine whether the ranking of the city-branches is stable, programming tools Expert Choice and Super Decisions were used.

Aside from the introduction, state of the art is given in Section 2. The objectives of the research and the research methodology are stated in Section 3. The Analytic Hierarchy Process is described in Section 4. The developed AHP model is explained in Section 5, while the validation of the model is given in Section 6. The sensitivity analysis is performed in Section 7, and the conclusion is given in Section 8.

2. STATE OF THE ART

Multi-criteria decision-making (MCDM) is a sub-field of Operational Research/Management Science, which refers to making decisions in the presence of a number of criteria that in most cases are conflicting. From the 1960-ies onwards it is considered to be an active research area and it has produced a high number of articles and books (Roy, 2005).

Velasquez & Hester (2013) give a literature review of common MCDM methods, pointing out the advantages and disadvantages of each method and their areas of application. They considered the following methods of MCDM: multi-attribute utility theory (MAUT) (see Fishburn, 1967; Keeney, 1974, 1977), Analytic Hierarchy Process (see Saaty, 1977, 1980), fuzzy set theory (see Zadeh, 1965), case-based reasoning (CBR) (see Aamodt & Plaza, 1994), data envelopment analysis (DEA) (see Charnes et al.,1978; Cooper et al., 2007; Thanasssoulis 2001), simple multi-attribute rating technique (SMART) (see Edwards, 1971, 1977), goal programming (GP) (see Charnes et al., 1955), ELimination and Choice Translating Reality (ELECTRE) (for ELECTRE I see Roy, 1968, for ELECTRE IS see Roy & Skalka (1984), for ELECTRE II see Roy & Bertier (1973) for ELECTRE III see Roy (1978), for ELECTRE IV see Roy & Hugonnard (1982) and for ELECTRE TRI see Roy & Bouyssou (1993)), Preference Ranking Organization METHod for Enrichment of Evaluations (PROMETHEE) (for PROMETHEE I and II see Brans et al. (1984)), simple additive weighting (SAW) (for SAW see Hwang & Yoon, 1981) and technique for order of preference by similarity to ideal solution (TOPSIS) (for TOPSIS see Hwang and Yoon, 1981, Yoon, 1987, Hwang et al., 1993).

Mardani et al. (2015) made a literature review for MCDM techniques and their application. They considered 393 articles, published in more than 120 international peer-reviewed journals from the Web of Science database in the period 2000-2014. The articles are grouped in the following 15 fields: energy, environment and sustainability, supply chain management, material, quality management, GIS, construction and project management, safety and risk management, manufacturing systems, technology management, operation research and soft computing, strategic management, knowledge management, production management, tourism management and other fields. The highest number of articles (109) is found in the application field of operation research and soft computing, followed by the field of energy, environment and sustainability with 53 articles, and only 5 articles are applied in the field of knowledge management. The European Journal of Operational Research has published the highest number of articles (70), followed by the Journal of Expert Systems with Applications, having published 20 articles. According to the frequency of application of decision-making techniques (AHP, ELECTRE, DEMATEL, PROMETHEE, TOPSIS, ANP, aggregation DM methods, hybrid MCDM and VIKOR), the most used one is the AHP (128 articles), followed by: the hybrid MCDM (64 articles), aggregation DM methods (46 articles), TOPSIS (45 articles), ELECTRE (34 articles), ANP (29 articles), PROMETHEE (26 articles), VIKOR (14 articles), and DEMATEL (7 articles).

When a choice of the best alternative from several alternatives has to be made, or alternatives should be ranked so that multiple criteria are taken into consideration on the basis of which alternatives are evaluated, the Analytic Hierarchy Process is one of the most commonly used MCDM methods. It can be used to solve complex problems in education, healthcare, banking, manufacturing, government, sport, etc. In the focus of this paper is the application of the AHP in banking, more specifically to rank city-branches of banks, so below we refer to the references in this field.

Javalgi et al. (1989) apply the AHP for bank management and their empirical analysis was conducted in a major metropolitan area. Arbel & Orgler (1990) apply the Analytic Hierarchy Process to bank strategic planning, i.e. bank mergers and acquisitions strategy. They developed a model that was tested in a bank holding company. Xie & Gong (2008) use fuzzy AHP and Balanced Scorecard to evaluate the performance of commercial banks. Haghighi et al. (2010) use fuzzy AHP in order to examine the impact of 3D-readiness on the development of e-banking in Iran. They have interviewed thirty bank managers and experts in Iran, and have concluded that the most important attribute of the development of e-banking is “industry e-readiness”. Onder et al. (2013) evaluate the financial performance of Turkish banks by using the methods: AHP and TOPSIS. The observed period in the study is 2002-2011. Rezaei et al. (2013) use fuzzy AHP to determine effective factors weight on optimizing the balance sheet of banks. The study is applied in the Refah bank. Nasrabadi et al. (2014) rank five branches of the Sina bank from the perspective of electronic banking by using the AHP. The following were included as criteria: efficiency and system responsiveness, quality and safety of provided data and services, customer and customer-orientation, designing and implementing e-services, and web 2.0 tools recruitment. The relative weight of the criterion efficiency and system response was the highest (0.345), followed by: quality and security of information and services (0.276), customer and customer-orientation (0.169), designing and implementing e-services (0.121), and using web 2.0 tools (0.890).

In the existing literature there was not found an article with an application of the AHP like this presented in our paper thus leading to the conclusion that this is an original application of the AHP.

3. OBJECTIVES AND RESEARCH METHODOLOGY

The objectives of the empirical research are:

- to develop AHP model for ranking the city-branches of banks;
- to validate developed AHP model by performing a ranking of the city-branches in the groups they belong to – case study of Commercial bank AD Skopje
- to perform sensitivity analysis in order to examine the sensitivity, i.e., the stability of the obtained results.

The main goal of this paper was to present developed AHP model for prioritization of city-branches of bank that is a model that can be used for comparisons of city-branches in general; to present results of the AHP model validation in comparisons of city-branches of Commercial bank AD Skopje.

In order to realize the objectives of the research, the fololwing steps were done:

- to conduct an interviews with the Manager of the Independent Domestic Payment Operations Department and with employees in this Department to define criteria for ranking the city-branches and to develop the AHP model;
- to collect judgements of respondents to assess the importance of the criteria in terms of the goal, and priorities of alternatives in terms of each criterion;
- to perform sensitivity analysis by using the programming tool Expert Choice.

In order to identify the criteria, the method of interview was used and for assessment of the importance of criteria and priorities of alternatives the results of the survey were used (it was designed a questionnaire which was distributed to respondents by e-mail).

4. THE ANALYTIC HIERARHY PROCESS (AHP)

The AHP method is one of the most widely exploited MCDM decision-making methods in cases when the decision, it means the selection of given alternatives and their prioritizing, is based on several tangible and intangible criteria (sub-criteria). The process of complex decision problem solving is based on the problem decomposition into a hierarchy structure which consists of the goal, the criteria, sub-criteria and the alternatives. Hence the AHP is a general theory of relative measurement. It is used to derive relative priorities on absolute scales from both discrete and continuous paired comparisons in multilevel hierarchic structures based on the judgment of knowledgeable and expert people (Saaty, 2001). On the basis of the pair-wise comparisons, relative significance (weights) of elements of the hierarchy structure is calculated. The AHP can combine these judgments into a single representative judgment for the group and also including the importance of the individuals themselves.

The AHP method application can be explained in four steps (Saaty & Begicevic, 2010, Begicevic et al., 2011):

1. The AHP enables decision makers to structure decisions hierarchically. The hierarchy model of the decision problem is developed in such a way that the overall goal of the decision is at the top of the model, strategic objectives in the higher levels, evaluation criteria in the middle levels, and alternative choices at the bottom.
2. After the hierarchy has been determined, the decision makers begin the procedure of prioritizing in order to determine the relative importance of elements on each level. The AHP provides a structured framework for setting priorities on each level of the hierarchy using pair-wise comparisons, a process of evaluating each pair of decision factors at a given level on the model for their relative importance with respect to their parent. On each hierarchy structure level, the pair-wise comparisons should be done by all possible pairs of the elements of this level, starting with the top of the hierarchy and working its way to the lowest level. The decision maker's preferences are expressed by numeric values on 1-3-5-7-9 scale - Intensity of Importance Scale (Table 1).
3. On the basis of the pair-wise comparisons, relative significance (weights) of elements of the hierarchy structure are calculated, which are eventually synthesized into an overall priority list of alternatives. Decision maker is allowed to change preferences and to test the results if the inconsistency level is very high. The consistency of the judgments is tracked using the rigorous math

analytics behind the AHP to validate the decision process. In cases where inconsistency is above 10% it is recommended that the criteria and judgments be revisited (Saaty, 1980).

4. Results are priorities of the alternatives and hierarchy tree with objective's relative significance. The sensitivity analysis is also carried out. Sensitivity analysis is used to determine the sensitivity of the alternatives to changes in the objectives' priorities.

Table 1: Intensity of Importance Scale (Saaty, 2012, p. 6)

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
2	Weak	
3	Moderate importance	Experience and judgment slightly favor one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgment strongly favor one activity over another
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
Reciprocals of above	If activity *i* has one of the above nonzero numbers assign to it when compared with activity *j*, then *j* has the reciprocal value when compared with *i*	A reasonable assumption
Rationals	Ratios arising from the scale	If consistency were to be forced by obtaining *n* numerical values to span the matrix

5. DEVELOPING THE AHP MODEL FOR RANKING THE CITY-BRANCHES

The constructed AHP model consists of a goal, criteria, and alternatives. The goal is to rank the city-branches of the bank in the groups to which they belong, the alternatives are the city-branches that belong to each group, and in order to determine the criteria, the Manager of the Independent Domestic Payment Operations Department and the employees in this Department were chosen as respondents. The determination of the criteria was based on the results of interviews, questionnaires and qualitative analysis of relevant documents.

The activities which take place in the groups of city-branches are: denar savings, bank accounts, foreign currency savings, loans, transaction accounts, foreign exchange operations, other services, public services, master cards, business trip, commission, domestic payment operations, statements of transaction accounts, standing orders for utilities, issuing lists of codes, documents for bank cards, contracts for e-banking and input pensions. According to the value of each criterion for which data from internal reports of the bank departments are used, 8 activities are selected, which have the highest values in the observed period and the same serve as criteria: denar savings, foreign currency savings, transaction accounts, exchange operations, public services, master cards, fees for payment operations (commission), and domestic payment operations. The criteria are described in Table 2.

The AHP model for ranking the city-branches that belong to group A is presented in Figure 1, and in an analogous manner the AHP models for ranking the city-branches of groups B and C can be represented.

Table 2: Description of criteria

Criteria	Description
Denar savings	Deposit and money withdrawal from savings bank book, interest, authorization, representation, opening and replacement of savings book, etc.
Foreign currency savings	Deposit and money withdrawal from savings bank book, pledge of foreign currency deposit, conversion, interest, authorization, representation, opening and replacement of savings book, etc.
Transaction accounts	Cash and non-cash transfers, interests, statement of account, opening transaction account, authorization, representation, etc.
Exchange operations	Purchase/sale of foreign currency, difference in exchange rates-exchange operations, check received on encashment
Public services	Payments for public services, embassies, Western Union
Master Cards	Pay-in and pay-out (master card transfers)
Fees for payment operations (commission)	Fees (commission) calculated and charged while transaction being processed by bank clerk
Domestic Payment Operations	Cash and non-cash payments (payments-in and withdrawals) processed through payment instruments in the domestic payment operations

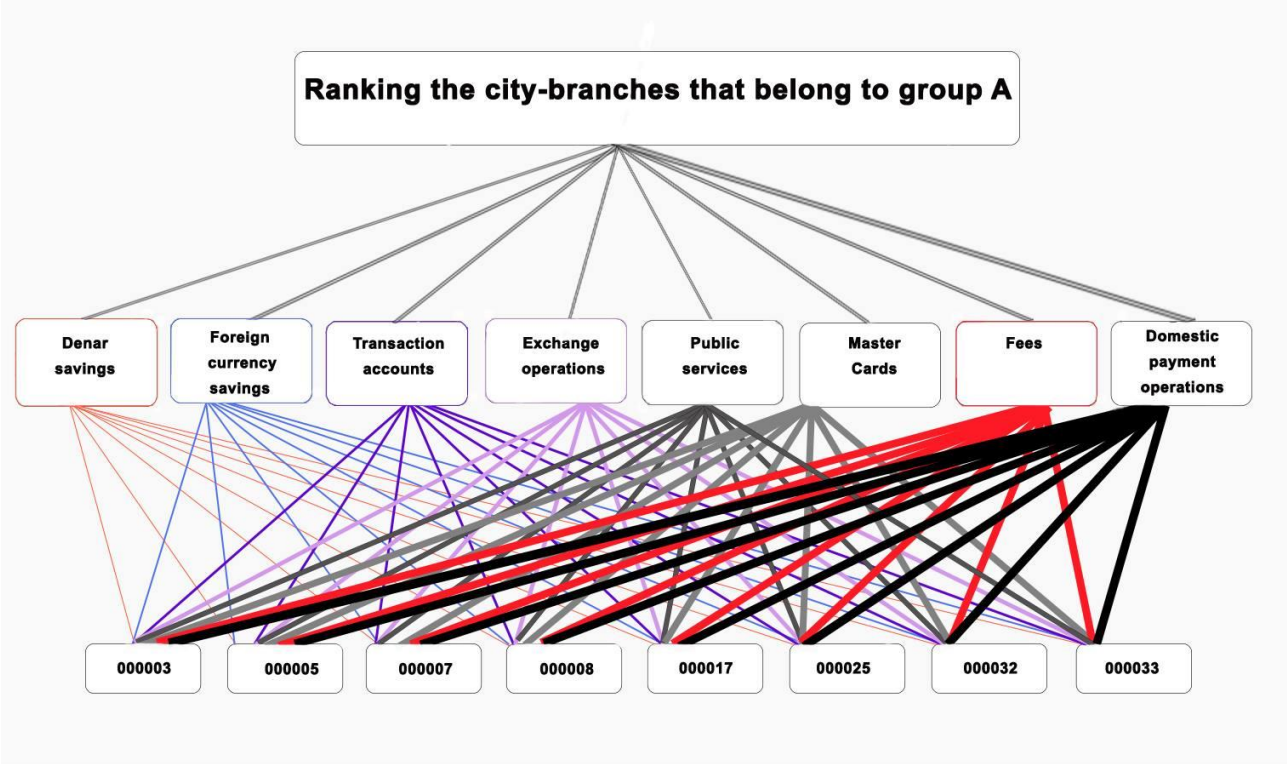

Figure 1: The AHP model for ranking the city-branches that belong to group A

6. VALIDATION OF THE AHP MODEL

The AHP is applied for ranking the city-branches of Commercial bank AD Skopje that are located in Skopje (11 Oktomvri, Avtokomanda, Biser, Buket, Bunjakovec, Butel, Vlae, Vodnjanska, GTC 1, Drachevo, Gjorce Petrov, Ekonomski fakultet, Jane Sandanski, JAT, Kapishtec, Kjubi, Leptokarija, Lisiche, Makpetrol, Madzari, MVR, Nova Makedonija, Novo Lisice, Partizanska, Rasadnik, Ruzveltova, Skopjanka, Stopanska komora na Makedonija, Sudska palata, Topansko pole, Cvetan Dimov, Centrala, Cair, Cento, Cesma, and Shuto Orizari).

Information about the profile of the bank's city-branches are obtained through the conducted interviews with the Chief Operative Officer of the bank and the Manager of the Independent Domestic Payment Operations Department.

According to the number of active counters, the city-branches are classified in the following three groups: group A with 1-3 active counters, group B with 2-5 active counters, and group C with 4-9 active counters. Groups A and B differ only in the number of employees, and group C, despite the number of employees, differs from groups A and B in that it has counters for transaction accounts and the following services can be performed: standing orders for utilities, issuing lists of codes, documents for bank cards, contracts for e-banking and input pensions.

In order to rank the city-branches of Commercial bank AD Skopje in the groups they belong to, the period from 2008 to 2011 was covered, and for an adequate comparative analysis, only the city-branches that belong to each of the groups in 2008 are taken into consideration for the entire observed period. Since the transactions which are done in the Head Office are significantly extensive, more complex and may not be comparable and placed in correlations made between the three groups of branches, they are excluded from the analysis. The research in the bank was conducted in 2011 and the data was collected in the period between 2008-2011 in which was obtained permission to use the data. The data used in the AHP model is not made public and is considered confidential, therefore it is not given in the paper, and the real name of the city-branches have been replaced with numbers. The following eight city-branches belong to group A: 000003, 000005, 000007, 000008, 000017, 000025, 000032 and 000033. Eleven city-branches belong to group B, and they are: 000006, 000009, 000012, 000016, 000020, 000027, 000028, 000030, 000035, 000036 and 000037, while the following ten city-branches belong to group C: 000004, 000010, 000013, 000014, 000018, 000019, 000021, 000023, 000031 and 000034. The city-branch 000010 has no counter for transaction accounts, and the city-branches 000013 and 000014, despite the services on the counters for transaction accounts, conduct international payment for legal entities. In this paper the focus is on the last year of the observed period, i.e. 2011.

After developing the AHP model, a questionnaire was composed in which the respondents (Officers of the Analysis, Information and Support Office) were asked to do pair-wise comparison in each level of the hierarchy and to express their preferences using the intensity of importance scale. The respondents first had to compare the criteria that were given in pairs by using the option of importance (i.e. which one of the two criteria that are compared in a pair is more important for the goal – ranking the city-branches in the groups they belong to in the observed time frame) and afterwards express their preferences with the help of the Saaty's scale. Next, in the same questionnaire, the respondents had to compare the alternatives, i.e. the city-branches that were given in pairs in regards to each criterion, and on the basis of the data for the observed period, to use the option of priority (which of the two city-branches that are compared in a pair is given priority in regards to the criterion) and to express their preferences with the help of the same scale. The prepared questionnaire was quite huge (a total of 320 pages), so it represented a fairly complex task for the respondents. The mentioned questionnaire is not added as an appendix due to its size.

The questionnaire was sent to the respondents by e-mail, and after they filled it, they submitted the quastinnaire by e-mail, determining that the questionnaires were fully completed. The values that were given in the questionnaires by the respondents were entered in the programming tool Super Decisions (Super Decisions Software, 2006) for each group of city-branches separately. There are four ways of assessing the comparisons in pairs in this software tool: graphically, verbally, through a matrix, and through a questionnaire. The data from the questionnaires that were filled by the respondents were entered in the tool Super Decisions through the choice of questionnaire. The obtained results i.e. the weights of the criteria and priorities of alternatives, are presented and analyzed below.

The weights of the criteria are shown in Figure 2. It can be seen from this Figure that only one criterion, i.e. the criterion of public services has a weight 0.045455, while the remaining seven criteria have same weight (0.136364).

The priorities of the alternatives that belong to groups A, B and C are shown in Figures 3, 4 and 5 respectively. The Consistency Ratio (CR) in all of the analyzed cases is 0.01 and it follows that the results are consistent.

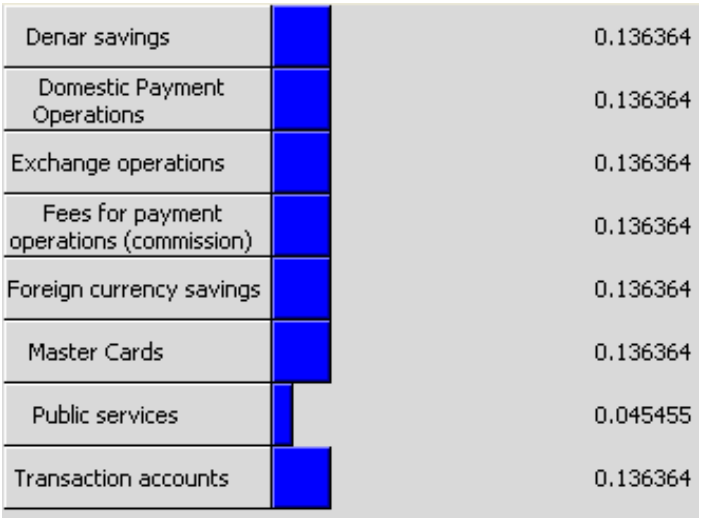

Figure 2: Weights of criteria

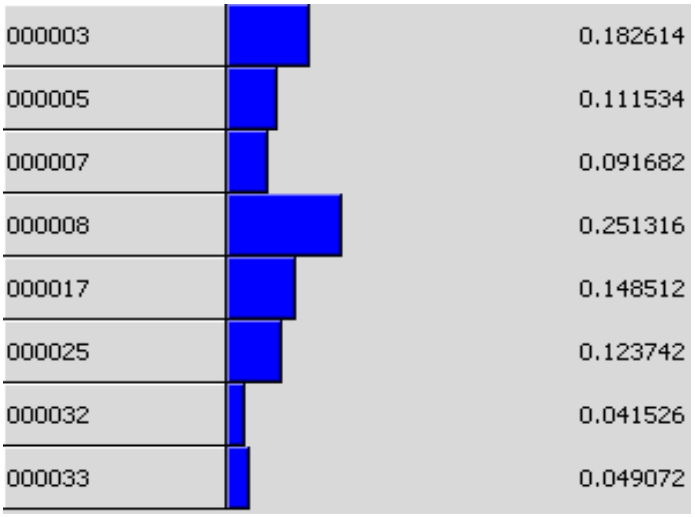

Figure 3: Priorities of city-branches that belong to group A

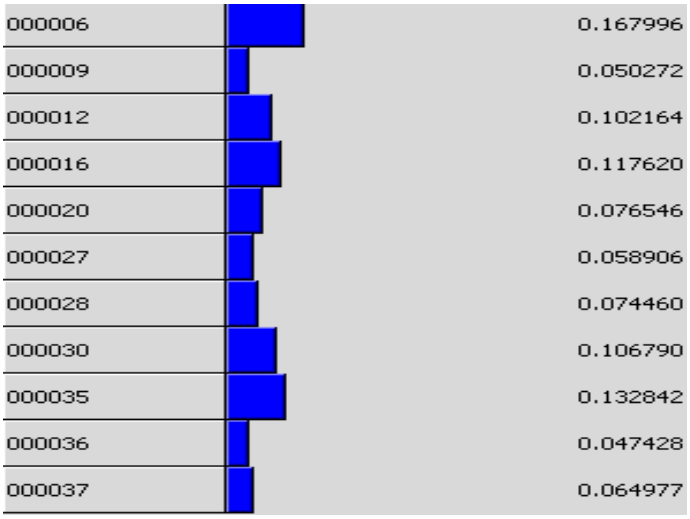

Figure 4: Priorities of city-branches that belong to group B

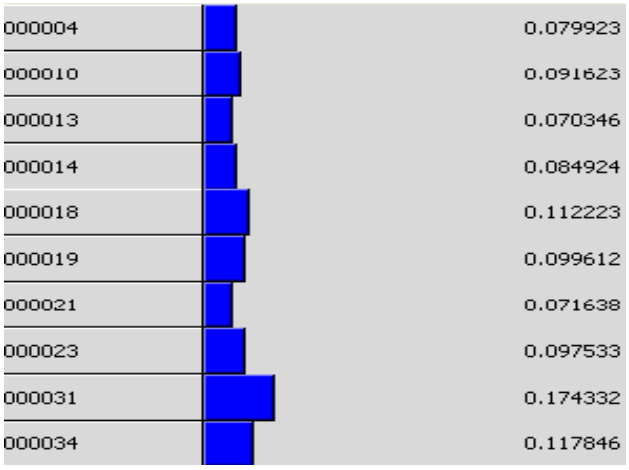

Figure 5: Priorities of city-branches that belong to group C

Based on the priorities of the city-branches their ranking is performed in the groups in which they belong (Table 3). It can be seen from this Table that in group A the highest ranked city-branch is 000008, followed by the city-branch 000003, while the lowest ranked branch is 000032. In group B, the highest ranked city-branch is 000006, followed by the city-branch 000035, while the lowest ranked city-branch is 000036. In group C, the highest ranked city-branch is 000031, followed by the city-branch 000034, and the lowest ranked city-branch is 000013.

Table 3: Rank of the city-branches of Commercial bank AD Skopje

City-branches that belong to group A	Rank	City-branches that belong to group B	Rank	City-branches that belong to group C	Rank
000003	2	000006	1	000004	8
000005	5	000009	10	000010	6
000007	6	000012	5	000013	10
000008	1	000016	3	000014	7
000017	3	000020	6	000018	3
000025	4	000027	9	000019	4
000032	8	000028	7	000021	9
000033	7	000030	4	000023	5
		000035	2	000031	1
		000036	11	000034	2
		000037	8		

7. SENSITIVITY ANALYSIS

Sensitivity analysis offers a stable solution and it enables change of inputs in order to observe the consequences on outputs, i.e. the priorities of the alternatives (Begicevic, Divjak & Hunjak, 2007). In order for a sensitivity analysis to be performed, the programming tool Expert Choice (Expert Choice, 2005) has been used. This tool contains the following five options for a sensitivity analysis: 1. Performance; 2. Dynamic; 3. Gradient; 4. Head to Head and 5. 2 D.

Most interesting for analysis are the three top ranked city-branches from each group for 2011, and also there have been chosen three criteria. Out of the eight criteria, seven of them are equally important for each model, hence resulting in a combination of three criteria (if the criteria had a different importance, then it would have been suitable to choose the three criteria that have the highest weights). Such an approach, with three criteria and three alternatives, could have been realized in the trial version of the Expert Choice software, for which access was given, while in the models that were created in Expert Choice, data from the filled questionnaires by the respondents were used.

For the first AHP model, in which the city-branches that belong to group A are ranked, the top ranked have been chosen to be the city-branches: 000008, 000003 and 000017; the criteria being: foreign currency savings, exchange operations, and domestic payment operations. For the purpose of comparing the elements of the hierarchy in pairs, the data from the filled questionnaires by the respondents were used

(explained in Section 6). The weight for each of the criteria is 0.333, while for the alternatives 000008, 000003 and 000017, the overall priorities are 0.483, 0.297 and 0.220, respectively.

Figure 6 is created through choosing the option of Performance from the menu Sensitivity-Graphs of the Expert Choice software. The weights of each criterion and the ranking of the city-branches can be seen in it. Additionally, the order of the three city-branches for each criterion can be seen through this option. In regards to the criterion on foreign currency savings, the city-branches 000008 and 000003 are equally preferred, while regarding the other two criteria, the most preferred is the city-branch 000008. In order to see how the change of the input data (criteria) will reflect on the final results, there has been made a change of the importance of the criterion of foreign currency savings (because of the above-mentioned statement for both the alternatives that are highly ranked), so its importance has increased by 20%, which has seen a slight decrease in the overall priority of the city-branch 000008, a slight increase in the overall priority of the city-branch 000003, the city-branch 000017 having no changes, and the ranking of the city-branches stays the same. In addition, the importance of the criterion of foreign currency savings has changed (from 33.3% increasing to 60%), but there have been no changes in the ranking. Figure 6 also displays the alternatives 000003 and 000017 as being equally preferred in regards to the criterion of exchange operations, and its importance has changed as well to: 40%, 50%, and 60%, but once again, the ranking of the city-branches does not change.

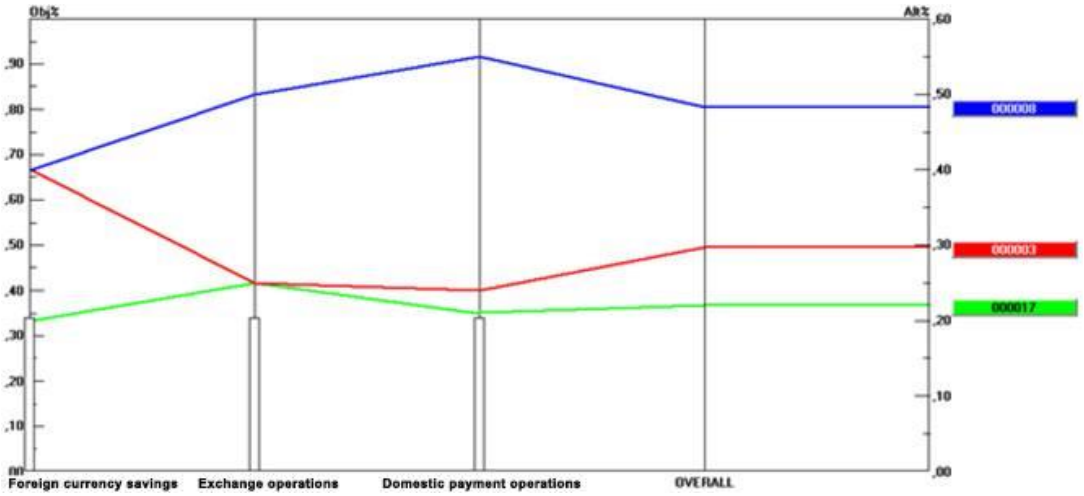

Figure 6: Sensitivity analysis - option Performance for the first AHP model

Through the option of Gradient, one can notice the sensitivity of the overall priorities of the city-branches 000008, 000003 and 000017 on the change of the importance of each criterion separately. The red vertical line shows how large the weight is for the chosen criterion. Figure 7 displays the conclusion that if the weight of the criterion of foreign currency savings increases, there is a decrease in the priority of city-branch 000008, an increase in the priority of city-branch 000003, while the priority of city-branch 000017 does not undergo significant changes.

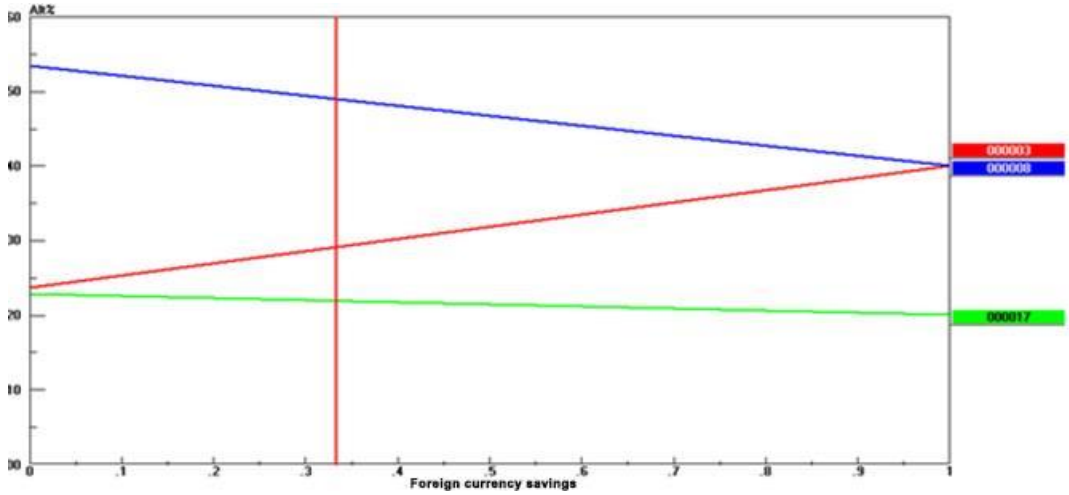

Figure 7: Sensitivity analysis - option Gradient for the criterion of foreign currency savings for the first AHP model

The option of Head-to-head is followed for one pair of city-branches (000017 and 000003). Figure 8 shows that the city-branch 000003 has an advantage over city-branch 000017, regarding the criteria: foreign currency savings and payment operations. What can be noticed in addition is that the weighed advantage of the city-branch 000003 (the gray triangle oriented towards the right) over city-branch 000017 is not considerably high.

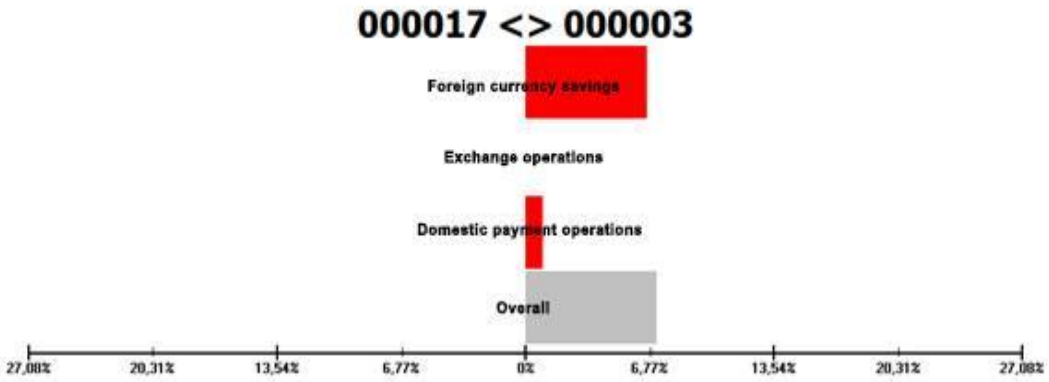

Figure 8: Sensitivity analysis - option Head-to-head for the city-branches: 000017 and 000003

In addition, the sensitivity analysis through the option of 2D is explained. In regards to the chosen criteria: foreign currency savings and exchange operation, the top city-branch is 000008 (Figure 9), and for its advantage over city-branch 00003 the contriubting criterion is exchange operations. City-branches 000003 and 000017 have the same priority in regards to the criterion of exchange operations, but when we take into consideration the criterion of foreign currency savings, then city-branch 000003 is in advantag

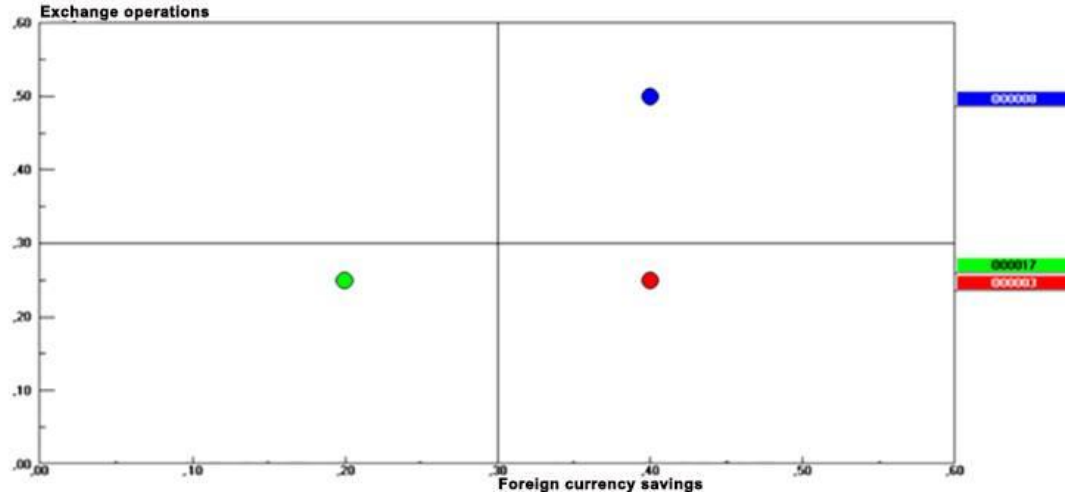

Figure 9: Sensitivity analysis - option 2D for the criteria: foreign currency savings and exchange operations for the first AHP model

For the purpose of analyzing whether the ranking of the three city-branches from Group A is stable, a sensitivity analysis is conducted, through the option of Dynamic, with the significance of each criteria separately increased by 5%. On the basis of the analyzed results it has been concluded that with the increase of the significance of the criteria by 5%, the ranking of the three city-branches from Group A is stable.

For the second AHP model, which ranks the city-branches that are part of Group B, the three top ranking city-branches for 2011 have been distinguished: 000006, 000035 and 000016. At the same time, the following three criteria have been chosen: denar savings, master cards and commission. For the third AHP model, which ranks the city-branches that belong to Group B, the three top ranked city-branches for 2011 have been chosen (000031, 000034 and 000018), while the criteria chosen are: denar savings, foreign currency savings and transaction accounts. In order to analyze whether the ranking of the three city-branches of Groups B and C is stable, a sensitivity analysis has been conducted, through the option of Dynamic, thus concluding that the ranking is stable.

8. CONCLUSION

The AHP can be applied for solving numerous MCDM problems (planning, optimizing, measuring performances, resource allocation, conflict solving, etc.). Through the conducted research presented in this paper, the following scientific contributions have been achieved: the AHP model for ranking the city-branches of a bank was developed and it was validated on the case of Komercijalna Banka AD Skopje. In our experience, the developed AHP model has strongly motivated all of the respondents (experts in banking) because their knowledge and preferences were incorporated in it. The developed AHP model with obtained weights of criteria can be used for prioritization of the city-branches of banks in general. The benefits of using this model are: the calculation of weights of criteria for ranking the city-branches can help bank managers to be more objective in the process of ranking; the ranking procedure is more transparent and simpler; better quality in decision-making at city-branches; improving the performance of city-branches that has a positive influence on the successful operating of the bank in which they belong to. In our further research we plan to develop generic AHP model for comparison of city-branches, as well as to use statistical methods for defining criteria. We will also try to develop the ANP (Analytic Network Process) model for ranking city-branches of the bank.

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