Managerial and Market-Based Appraisal of Agriculture Banking Using ANP and ELECTRE Method

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Abstract

Agricultural sector plays a very important role for the economies of the countries. It satisfies food needs of the people, provides raw materials to the industry sector and decrease unemployment rate and current account deficit problem. However, agricultural sector has some structural problems, such as periodic income, but continuous costs and need for modern and expensive machines. Because of these problems, agricultural producers should obtain necessary finance in order to increase their competitive powers. Banks are important institutions providing financial sources to agricultural producers to be effective in agricultural sector while minimizing the problems of producers. Based on the issues in the field, this study aims to identify the performance of Turkish banks regarding agricultural sector. Within this scope, we analyzed the performance of state-owned, privately-owned and foreign banks in Turkey separately. In this study, ANP (analytic network process) and ELECTRE (elimination and choice translating reality) methods have been used in order to achieve the objective of this study. As a result of this analysis, it was determined that with respect to net superior values, privately-owned banks have the greatest value in comparison with other banking groups. On the other hand, regarding net inferior values, foreign banks have the best performance. These two results show that state-owned banks do not have the highest performance. This situation identifies that the popularity of agriculture sector increased very much in Turkey so that privately-owned banks and foreign banks started to give more importance to this sector.

Keywords: *management; performance evaluation; banking sector; agriculture banking; ANP; ELECTRE*

1. Introduction

Agricultural sector satisfies the needs vital needs of the people in the country, such as food needs (Aksu, 2012). In addition to this situation, this sector helps to decrease unemployment rate by employing more people in the country (Adam, 2016). Furthermore, it provides raw material to industry sector that is based on agriculture (Barani et. al., 2015). Additionally, agriculture sector increases exports of the country (Patnaik, 1996). Owing to this situation, it affects current account balance of the country positively. While taking into consideration of these issues, it can be said that agriculture sector plays an essential role for the economies of the countries (Demetriades et. al., 1998).

Nevertheless, agriculture sector has some systematic problems because of its nature. For example, because this sector depends on the type of the climate, the income has to be periodic (Chisasa and Makina, 2013). In other words, agricultural producers have to wait for a long time in order to generate income. In spite of this situation, the costs of these producers are continuous. That is to say, the costs of the producers, such as supplying raw materials, production, storing and marketing goods and wages of the employees should be met before earning periodic income. This means that agricultural producers have maturity mismatch with respect to their costs and revenues (Rahman et. al., 2014).

Another problem of agricultural sector is that modern machines should be used in order to increase production (Terin et. al., 2014). As a result of this issue, it will be possible to raise the efficiency. However, most of these machines are

very expensive for the producers. Due to this situation, agricultural producers should get necessary finance so as to have these machines. If they cannot use them, they will lose competitive advantage. This aspect causes decreases in the revenue of these producers (Ekwere et. al., 2014).

Because of the problems emphasized above, it is very significant for agricultural producers to obtain necessary finance in order to save competitive advantage and increase revenue (Hartarska et. al., 2015). Banks are the institutions that can provide this finance to the producers (Money, 2015). Despite this issue, some producers may provide finance from some different sources other than banks due to some problems. As an example, banks may not give loans to some agricultural producers since they cannot measure the credibility of these producers effectively (Ali, 2014).

Owing to this kind of problem, agricultural producers have to get finance some other sources, such as usurers. This situation increases the cost of finance for the producers because they have to pay higher amount of interest in this situation. As a result of this problem, many agricultural producers may lose their wealth and this situation leads to both economical and psychological problems. Due to this issue, it is very important to increase the effectiveness of the banks in agricultural sector. Hence, the studies related to this issue play a significant role in order to achieve this objective.

For that purpose, in this study, we aim to identify the performance of Turkish banks regarding agricultural sector. Within this scope, we try to analyze the performance of state-owned, privately-owned and foreign banks in Turkey separately. In addition to this situation, ANP and ELECTRE I methods are used in order to achieve this objective. Within this context, we define criteria so as to assess the performance of these banking groups with respect to agricultural sector. As a result of this analysis, it will be possible to compare the performance of the banking groups. Hence, it will be understood which banking groups are more effective in agricultural sector.

The paper is organized as follows. After introduction part, we explain managerial and market-based appraisal of agricultural banking. In this part, we describe 8 different criteria which will be used in the analysis part. Additionally, the third part gives information about ANP and ELECTRE I methods. Also, fourth part includes research and application to understand the performance of the banking groups in Turkey. Finally, the results of the analysis were given at conclusion.

2. Performance Evaluation and Agriculture Banking

It is very important to evaluate the performance of agricultural banks (Sarlak and Fard, 2009). In other words, it is significant to define appraisal criteria with respect to the performance of agriculture banking. Although some criteria may be similar to the traditional banking, there should be unique criteria in order to evaluate agriculture banking. Regarding the evaluation of agriculture banking, we can make either managerial or market-based appraisal. The main criteria are explained in Table 1.

Table 1. Appraisal Criteria of Agricultural Banking

Appraisal Type	Appraisal Criteria	Reference
Managerial-based	The Number of Personnel	Ahmadi et. al. (2011), Chowdhury and Chowdhury (2011)
	Operational Capacity	Ahmadi et. al. (2011)
	Customer Support	Sarlak and Fard (2009)
Market-based	The Number of the Banks	İloğlu (1964), Kliesen and Gilbert (1996), Bonin et. al. (2005), Yılmaz (2008), Chowdhury and Chowdhury (2011), Kandemir (2010)
	The Number of the Branches	İloğlu (1964), Kliesen and Gilbert (1996), Bonin et. al. (2005), Yılmaz (2008), Chowdhury and Chowdhury (2011), Kandemir (2010)
	Deposits	Chowdhury and Chowdhury (2011)
	Agricultural Loans	Aruoba (1969), Belongia and Gilbert (1990), Fırat and Çiçek (2000), Kızılaslan and Köksal (2002), Anderson and Feder (2003), Admassie (2004), Ellinger (1994), Yıldız and Oğuzhan (2007), İnci (2010), Koçtürk et. al. (2012)
	Total Assets	Armah et. al. (1999), Minh et. al. (2012)

As it can be seen in Table 1, we defined 8 appraisal criteria of agricultural banking. It was also determined that 3 of them are related to managerial-based criteria whereas there are 5 market-based criteria. Managerial appraisal criteria show that indicators which are related to the management of the banks. On the other hand, market-based criteria refer to the qualitative factors that give information about the performance of the banks.

Regarding managerial appraisal of agriculture banking, the number of the personnel is an important criterion. This shows the power of the banks in agriculture sector. In other words, when banks have more personnel, they have the chance to create new and effective projects in agriculture sector. Ahmadi et. al. (2011) made a study in order to analyze the performance of Iranian banks in agriculture sector. They concluded that the number of the personnel is the significant performance indicator. Also, Chowdhury and Chowdhury (2011) used the number of the personnel as a performance criterion.

Operational capacity of the banks is the second criterion in managerial-based appraisal of agriculture banking. It includes data security, IT background and the speed of problem solution related to these topics. Additionally, the physical conditions of the branches can be considered in this criterion. Ahmadi et. al. (2011) used operational capacity as an indicator so as to assess the performance of agricultural bank in Iran.

Another indicator related to managerial-based appraisal of agriculture banking performance is the customer support. It shows how a bank makes a communication with their customers. The main reason behind this situation is that customers give important feedbacks to the banks. If the banks give importance to this information, it may be possible for them to solve many problems. Sarlak and Fard (2009) made a study to see the effects of customer support in the performance of agriculture banking.

On the other hand, with respect to the market-based appraisal of agriculture banking, there are some important criteria. First of all, the number of the banks and the branches give important information as for the performance of the banks related to agriculture sector. İloğlu (1964) made an analysis about the importance of the banks in agriculture sector of Turkey. He concluded that Ziraat Bank is the most important bank for the agriculture sector by analysing the number of the banks and branches in Turkey. Kliesen and Gilbert (1996), Bonin et. al. (2005), Yılmaz (2008), Chowdhury and Chowdhury (2011) and Kandemir (2010) also considered this criteria in their studies.

In addition to this aspect, the amount of deposit is accepted as a performance indicator in agriculture banking. The higher amount of the deposit shows that the more depositors trust this bank. That is to say, this criterion shows the credibility of the banks. Chowdhury and Chowdhury (2011) made a study so as to evaluate the performance of agricultural banks in Bangladesh. In this study, they used deposit amount of the banks as a performance indicator.

Another important criterion in order to appraise agriculture banking is the amount of agricultural loans of the banks. This criterion is effective to analyze the performance of the banks for only agriculture sector (Obilor, 2013), (Çevik and Zeren, 2014), (Adeyinka et. al., 2015), (Ahmad et. al., 2015). In other words, it does not give important information to analyze the performance of traditional banking. Aruoba (1969) analyzes the performance of Turkish banks in agriculture sector by using agricultural loans. Belongia and Gilbert (1990) also made similar analysis for USA while considering the same criterion. In addition to these studies, Fırat and Çiçek (2000), Kızılaslan and Köksal (2002), Anderson and Feder (2003), Admassie (2004), Ellinger (1994), Yıldız and Oğuzhan (2007), İnci (2010) and Koçtürk et. al. (2012) also used the amount of agricultural loans of the banks to identify the agricultural performance of the banks.

The amount of total assets of the banks is also a criterion in order to show the performance of agriculture banking. This criterion shows the size of the banks and gives information related to performance result. Armah et. al. (1999) tried to evaluate the performance of agricultural banks and concluded that large agricultural banks are more efficient. Minh et. al. (2012) made a study so as to analyze the efficiency of agricultural banks. They used the amount of total assets as a performance indicator in this study.

3. ANP and ELECTRE Method

3.1 ANP Method

It is very important to determine the correct relationship between the variables. Many techniques were developed in order to analyze this relationship accurately. Analytic Network Process (ANP) is one of the new techniques that are used in complex situation. Saaty (1999) made a study so as to determine how to structure a decision problem. In this study, he identified the fundamentals of ANP. This new technique is very similar to the Analytic Hierarchy Process (AHP) developed also by Saaty in 1990. Nonetheless, the main difference of ANP from AHP is that it considers

network structure instead of hierarchy. Because of this aspect, it was thought that ANP approach gives effective results.

The first stage in the implementation of ANP technique is the creation of the sub problems from the original problem (Dinçer et. al., 2016). Also, Saaty developed a qualitative scale in order to compare the importance of the variables. 9 different values of this scale are emphasized below (Chang et. al., 2015).

- 1=Equal importance
- 2=Weak
- 3=Moderately Important
- 4=Reasonably plus
- 5=Strong weight
- 6=Strong plus
- 7= Very well-built confirmed important
- 8=Very, very strong
- 9=Excessive importance

By obtaining the values from this scale, a matrix is created to make this qualitative variable as quantitative (Saaty, 1990). The details of this matrix are given below.

$A = [a_{ij}]_{nxn}$ where $i = 1, \ldots, n$ $j = 1, \ldots, n$

In addition to this situation, the consistency of this matrix should be measured. The details of the consistency ratio (CR) are explained in the following equation.

$$\mathrm{CR} = \frac{CI}{RI}$$

In this equation, CI represents consistency index and RI gives information about random consistency. The critical value for consistency ratio was identified as "0.1". If CR is less than this value, this means that the matrix is consistent (Saaty, 1990). The next stage in this process is the development of supermatrix. If the sum of the column in this supermatrix is less than "1", it should be normalized. After normalization process, limit supermatrix is formed to see the effects of the variables in the long run. Finally, the best alternative is chosen (Dinçer et. al., 2016).

There are many studies in which ANP method was used in the literature. Meade and Presley (2002) and Mohanty and others (2005) used ANP to select the best project in resource and development. Sadeghi and others (2012) tried to select the best supplier by using this method. In addition to these studies, Shahabi and others (2014), Şevkli and others (2012) and Görener (2012) compared AHP and ANP in their studies. Additionally, Lam (2015) tried to design supply chain, Sakthivel and others (2014) selected the best biodiesel blend and Beltran and others (2014) analyzed investment projects by using ANP method.

3.2 ELECTRE Method

ELECTRE method is used to determine the best alternative by making pairwise comparison among the alternatives (Beccali et. al., 1998). In other words, it was aimed to identify better alternatives. This method was firstly created by Bernard Roy in 1968 (Dias and Climaco, 1999). The most important advantage of this method is that it is possible to consider both qualitative and quantitative data in the analysis. Another significant aspect of this method is that there is no need to have high amount of data in order to make analysis (Duckstein and Gershon, 1983).

There are some kinds of ELECTRE methods for multi criteria decision making process. One of the most used is ELECTRE I method. The steps of ELECTRE I method can be explained as follows:

First of all, starting matrix, which is also called as decision matrix, is created. In the rows of this matrix, there are decision points whereas evaluation factors are stated in the columns (Figueria and Roy, 2002). The details of this matrix are given below.

$$A_{ij} = \begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{bmatrix}$$

In the matrix above, A_{ij} represents the starting matrix. After creating starting matrix, standard decision matrix is calculated. The equation of this matrix is given below.

$$x_{ij} = \frac{a_{ij}}{\sqrt{\sum_{i=1}^{m} a_{ij}^2}}$$

In this equation, x_{ij} identifies starting matrix while a_{ij} refers to the components of starting matrix. The standard decision matrix is shown below.

$$X_{ij} = \begin{bmatrix} x_{11} & \cdots & x_{1n} \\ \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mn} \end{bmatrix}$$

Third stage of this process is to define the weighted standard decision matrix. The experts, who evaluate the criteria, give values and as a result of this evaluation, weighted factor of each criterion is calculated. The details of the weighted matrix are given below (Pang and Chen, 2011).

$$Y_{ij} = \begin{bmatrix} w_1 x_{11} & \cdots & w_n x_{1n} \\ \vdots & \ddots & \vdots \\ w_1 x_{m1} & \cdots & w_n x_{mn} \end{bmatrix}$$

In this matrix, "w_i" represents weighted factors. Each of these weighted factors should be between "0" and "1" and the sum of all factors should be equal to "1". Moreover, in the next step, concordance (C_{kl}) and discordance (D_{kl}) matrixes are developed. In the creation of these matrixes, components of these matrixes are compared (Mousseau et. al., 2001). The concordance interval set is detailed below.

$$C_{kl} = \{j, y_{kj} \geq y_{lj}\}$$

On the other hand, discordance interval set is the following.

$$D_{kl} = \{j, y_{kj} < y_{lj}\}$$

Also, concordance interval matrix is calculated by using following equation.

$$C_{kl} = \sum_{j \in C_{kl}} w_j$$

In addition to this situation, calculation of discordance matrix is given below.

$$D_{kl} = \frac{max|y_{kj} - y_{lj}|}{max|y_{mj} - y_{nj}|}$$

In the equation above, "m" and "n" is used so as to calculate the weighted normalized value among all components in the row (Pang and Chen, 2011). Moreover, critical value for concordance index matrix is given below.

$$C^* = \frac{1}{m(m-1)} \sum_{k=1}^{m} \sum_{l=1}^{m} C_{kl}$$

In the equation above, "C*" represents the critical value and "m" explains the number of decision points. If C_{kl} is less than C*, this means that the component of concordance index matrix will be equal to "0". However, in the opposite situation, it will be equal to "1" (Pang and Chen, 2011). Additionally, critical value for discordance index matrix is given below.

$$D^* = \frac{1}{m(m-1)} \sum_{k=1}^{m} \sum_{l=1}^{m} D_{kl}$$

Similarly, if D_{kl} is less than D*, this means that the component of discordance index matrix will be equal to "0". Also, for the opposite situation, it will be equal to "1". The last version of this process is to make decision. In order to achieve this objective, the components, which have highest concordance and lowest discordance indexes, are chosen (Rogers and Bruen, 1998).

There are a lot of studies in which ELECTRE I method is used in the literature. Hatami-Marbini and Tavana (2011) made a study related to group decision making and concluded that ELECTRE approach reveals more useful information than TOPSIS method. Moreover, Almedia (2005) tried to determine the best service quality criteria by using ELECTRE I method. Furthermore, Shanian and Savadogo (2006) made a study related to the material selection of bipolar plates. In order to select the best alternative, they used ELECTRE I method.

Bojkovic et. al. (2010) made a study about cross-country transport-sustainability. In this study, the evaluation is made by using ELECTRE I method. In addition to this study, Cheng et. al. (2009) tried to analyze outsourcer selection by using ELECTRE I method. Moreover, Aytaç et. al. (2011) used this method so as to evaluate catering firm alternatives. Furthermore, Çelik and Ustasüleyman (2014) evaluated the service quality of GSM operators in Turkey.

4. An Application on Turkish Banking Sector

In this study, banking groups in Turkey have been considered for the possible ranking of alternatives. 8 criteria have been determined as number of banks, number of branches, number of deposit accounts, number of employees, agriculture loans (USD million), total assets (USD million), customer support and operational capacity (10 point likert-scales). Employee, customer and operational items of agriculture banking could be defined in the managerial criteria of the performance measurement. However, number of banks, number of branches, and deposit accounts as well as total assets could be appointed as market-based parameters in the performance ranking of the banks. Table 2 shows the selected performance criteria of the banking groups defined as state-owned banks, privately-owned banks, and foreign banks by the end of 2015.

Table 2. Selected Performance Criteria for the Agriculture Banking in Turkey by the End of 2015

	Number of Banks (C1)	Number of Branches (C2)	Number of Deposit Accounts (C3)	Number of Employees (C4)	Agriculture loans (USD million) (C5)	Total Assets (USD million) (C6)	Customer support (10 point scales) (C7)	Operational capacity (10 point scales) (C8)
State-owned banks (A1)	3	3,681	71,533,211	58,211	12,983	230,809	6	5
Privately-owned banks (A2)	9	4,299	56,519,998	74,756	812	291,723	9	9
Foreign banks (A3)	21	3,170	36,011,245	62,646	1,826	204,647	8	7

Source: The banks Association of Turkey, Financial Statements, Author Construction

As seen in the table, while state-owned banks own the moderate results, they have the highest number of deposit accounts and agriculture loans in the Turkish banking system. By the way, privately-owned banks have the best degrees in the number of branches, number of employee and total assets besides customer support and operational capacity. Foreign banks are the best in the number of banks in the banking group.

The analysis has been constructed in the two main phases. In the first phase, the weights of the criteria have been calculated using ANP method. Normalized values of pairwise comparison matrix for the each criteria and alternatives have been computed using 9 point scales. Accordingly, weighted super matrix and limit matrix have been calculated for determining the weight of each criterion in table 3 and 4 respectively.

Table 3. Weighted Supermatrix

	C1	C2	C3	C4	C5	C6	C7	C8	A1	A2	A3
C1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4160	0.1524	0.1105
C2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1278	0.1461	0.1924
C3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1058	0.1749	0.1831
C4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0856	0.1136	0.1362
C5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0623	0.0918	0.0379
C6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0536	0.1284	0.1163
C7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0820	0.1046	0.1118
C8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0669	0.0882	0.1118
A1	0.0605	0.3338	0.6479	0.1062	0.7235	0.2299	0.1416	0.1062	0.0000	0.0000	0.0000
A2	0.5544	0.5247	0.2299	0.6333	0.0833	0.6479	0.5247	0.6333	0.0000	0.0000	0.0000
A3	0.3851	0.1416	0.1222	0.2605	0.1932	0.1222	0.3338	0.2605	0.0000	0.0000	0.0000

Table 4 presents that C1 has the highest degree of importance in the managerial and market-based criteria as C5 is the weakest important factor in the multiple evaluation criteria. C3, C2, C4, C6, C7, and C8 have the importance degrees consecutively.

Table 4. Limit Matrix

	C1	C2	C3	C4	C5	C6	C7	C8	A1	A2	A3
C1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2154	0.2154	0.2154
C2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1519	0.1519	0.1519
C3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1577	0.1577	0.1577
C4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1112	0.1112	0.1112
C5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0710	0.0710	0.0710
C6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1049	0.1049	0.1049
C7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1000	0.1000	0.1000
C8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0879	0.0879	0.0879
A1	0.2767	0.2767	0.2767	0.2767	0.2767	0.2767	0.2767	0.2767	0.0000	0.0000	0.0000
A2	0.4878	0.4878	0.4878	0.4878	0.4878	0.4878	0.4878	0.4878	0.0000	0.0000	0.0000
A3	0.2355	0.2355	0.2355	0.2355	0.2355	0.2355	0.2355	0.2355	0.0000	0.0000	0.0000

In the second phase of the analysis, ELECTRE I method has been applied for ranking the banking groups with managerial and market-based criteria of the banks. Table 5 illustrates the normalized decision matrix by the normalization method.

Table 5. Normalized Matrix

	Number of Banks (C1)	Number of Branches (C2)	Number of Deposit Accounts (C3)	Number of Employees (C4)	Agriculture loans (USD million) (C5)	Total Assets (USD million) (C6)	Customer support (10 point scales) (C7)	Operational capacity (10 point scales) (C8)
State-owned banks (A1)	0.1302	0.5675	0.7298	0.5125	0.9884	0.5436	0.4685	0.4016
Privately-owned banks (A2)	0.3906	0.6627	0.5766	0.6582	0.0618	0.6871	0.6247	0.7229
Foreign banks (A3)	0.9113	0.4887	0.3674	0.5515	0.1390	0.4820	0.6247	0.5623

Table 6 defines the weighted matrix by multiplying with the normalized matrix and the weights from the ANP method.

Table 6. Weighted Matrix

	Number of Banks (C1)	Number of Branches (C2)	Number of Deposit Accounts (C3)	Number of Employees (C4)	Agriculture loans (USD million) (C5)	Total Assets (USD million) (C6)	Customer support (10 point scales) (C7)	Operational capacity (10 point scales) (C8)
State-owned banks (A1)	0.0280	0.0862	0.1151	0.0570	0.0701	0.0570	0.0469	0.0353
Privately-owned banks (A2)	0.0841	0.1007	0.0909	0.0732	0.0044	0.0721	0.0625	0.0635
Foreign banks (A3)	0.1963	0.0742	0.0579	0.0613	0.0099	0.0506	0.0625	0.0494

Table 7 shows the concordance and discordance interval sets to compute the interval index and matrices.

Table 7. Concordance and Discordance Interval Sets

C(1,2)	(3,5)	**D(1,2)**	(1,2,4,6,7,8)
C(1,3)	(2,3,5,6)	**D(1,3)**	(1,4,7,8)
C(2,1)	(1,2,4,6,7,8)	**D(2,1)**	(3,5)
C(2,3)	(2,3,4,6,7,8)	**D(2,3)**	(1,5)
C(3,1)	(1,4,7,8)	**D(3,1)**	(2,3,5,6)
C(3,2)	(1,5,7)	**D(3,2)**	(2,3,4,6,8)

Table 8 presents the concordance and discordance interval matrix to determine the net superior values and net inferior values.

Table 8. Concordance and Discordance Interval Matrix

Concordance matrix			**Discordance matrix**		
-	0.2286	0.4854	-	0.8533	1
0.7714	-	0.7136	1	-	1
0.5146	0.3864	-	0.3581	0.2941	-

Table 9. Net Superior and Inferior Values and Ranking the Banking Groups

Banking Groups	Net Superior Values	Ranking	Net Inferior Values	Ranking
A1	-0.5718	3	0.4952	2
A2	0.8699	1	0.8527	3
A3	-0.2981	2	-1.3478	1

Table 9 clarifies the multiple performance results of banking group alternatives through net superior and inferior values. The analysis results demonstrate that A2 has the best degree while A1 has the worst degree in the net superior values. Nevertheless, A3 is placed in the first rank as A2 is ranked last based on the net inferior values.

5. Conclusion

The growth and sustainability of emerging economies rely on the successful contribution of agricultural sectors which demonstrate a very important role on employment. Increasing employment in economies, it helps also the financial stability. Additionally, the efficient use of agricultural facilities creates new export transactions with its impact on economic growth. As a result, it can be observed that agricultural sector has a positive effect on current account balance of the country. Notwithstanding this, there are some structural problems in agricultural sector. First of all, agricultural producers have to wait for a long time to get income due to climate condition whereas the costs are continuous. This situation causes maturity mismatch with respect to their costs and revenues. In addition to this issue, these producers need to have modern and expensive machines in order to increase their competitive power.

Based on structural problems in the agricultural sector, producers should get necessary financial sources to be more competitive. Within this scope, banks play crucial role in providing financing sources. As it is known, debt financing strategies in emerging countries become a costly way during financial crisis. In volatile market conditions, banks are demanding more gains in balance with increasing risks. This situation increases the cost of financing instruments for the producers because they have to pay higher amount of interest in this situation. As a result, the stability in the banking sector and the effective banking activities determine the success of debt financing strategies for producers in this sector. Therefore, the level of effectiveness in the banking sector should be assessed, examined and increased in efficient ways in order to boost the contribution of agricultural sector in emerging economies.

Within this perspective, in this study, the performance of Turkish banks regarding agricultural sector has been determines. We analyzed the performance of state-owned, privately-owned and foreign banks in Turkey separately. Moreover, ANP and ELECTRE I methods were used so as to achieve this objective. Within this context, 8 appraisal criteria of agricultural banking were defined. It was also determined that 3 of them are related to managerial-based criteria whereas there are 5 market-based criteria.

As a result of this analysis, it was defined that regarding net superior values, privately-owned banks have the greatest value in comparison with other banking groups. Additionally, foreign banks have the second performance. Moreover, state banks are the banking group that has the lowest performance in agricultural sector. On the other hand, with respect to the net inferior values, foreign banks have the lowest value that means they have the best performance. Furthermore, state-owned banks are the second banking group whereas privately-owned banks have the lowest performance.

According to the results of the analysis considering both net superior values and net inferior values, it was concluded that state-owned banks do not have the highest performance. Although state-owned banks are thought to be more active in agriculture sector in Turkey, our analysis result showed the opposite issue. This situation identifies that the popularity of agriculture sector increased very much in Turkey so that privately-owned banks and foreign banks started to give more importance to this sector.

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