

FINANCIAL PERFORMANCE TEST OF PUBLIC BANKS IN TURKEY: AN APPLICATION OF PROMETHEE

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—Abstract —

Performance test has become an important tool for banking sector and banks should implement performance test if they want to increase their level of competitiveness in today's highly competitive environment. Banking sector has always been very important factor for developing national economy. Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE) is one of the most recent Multiple Criteria Decision Making (MCDM) methods and has been successfully implemented in many fields.

This paper argues the possibility of using PROMETHEE method for measuring the financial performance of three public banks in Turkey by using two data sets. First data set is for the period from 2002 to 2007, and the second data set is from 2008 to 2012. Two data sets are determined and used in order to compare two periods – before the global financial crises (2002-2007), and during the global financial crises (2008-2012). PROMETHEE method is applied to the obtained data sets rigorously by using ten criteria for each bank.

The results of this paper show the possibility of using the PROMETHHE method in order to determine financial performance of public banks in Turkey.

Key Words: *Banking sector, PROMETHEE, Financial Performance*

JEL Code: C00

1. INTRODUCTION

MCDM refers to making decisions in the presence of multiple, usually conflicted criteria. MCDM problems are common in everyday life (Xu and Yang, 2001: 3). Based on multiple conflicting criteria's, MCDM often deals with ranking of many concrete alternatives from the best to the worst ones. The PROMETHEE is an outranking and simple ranking method for a finite set of alternative actions to be ranked and selected among criteria's. The PROMETHEE family initially included the PROMETHEE I for partial ranking of the alternatives and the PROMETHEE II for complete ranking of the alternatives. PROMETHEE II is fundamental method for implementation of the other PROMETHEE methods (Qu et al., 2012: 1). PROMETHEE II has been used with success to solve variety of problems. This method is based on a comparison pair per pair of possible decisions along each criterion. Possible decisions are evaluated according to different criteria's, which have to be maximized or minimized (Taillandier and Stinckwich, 2011: 1). The financial performance of the banking sector has been one of the main subjects in global financial environment. Consequently, the financial performance of banks represents a major importance to various stakeholders. Within this context, the aim of this paper is to test PROMETHEE method regarding measuring the financial performances of public banks in Turkey. This is innovative approach in measuring performance in financial-banking sector and there is significant potential usage of this approach in banking business and in science, because this approach can significantly upgrade the existing theory regarding methods in measuring financial performances.

2. DATA AND METHODOLOGY

Financial management is fundamental to company success, and a complex financial system is in need of companies' financial management information. It is obvious that, financial ratios can help to convert the mass of data (Akkaya ve Uzar, 2013: 151). There are two data sets in this study. First data set is the period for 2002-2007 and the second data set is the period for 2008-2012. The data sets are compiled from The Banks Association of Turkey's website (www.tbb.org.tr). According the availability of data, there are 3 public banks. These banks are: ZiraatBank, HalkBank, VakıfBank. During analysis phase; in terms of confidentiality

of performance data's about banks, codes were used instead of the names of the banks. The data were analyzed by using Visual PROMETHEE Academic software.

Ten criteria's were selected for measuring the financial performance. These are: equity/total assets, total deposit/total assets, total credit/total assets, total credit/total deposit, fixed assets/total assets, liquid assets/total assets, liquid assets/short term liability, term net profit-loss/total assets, term net profit-loss/equity, net primary income/total assets. According to the level of importance, for each criterion a weight is assigned. The values of the weight factors for the first data set are stated as equal because in this period analyzed in the first data set there were no significant financial turbulences that could cause major changes in the banking sector. The values of the weight factors increases in the second data set in accordance with the importance of the criterion during the global financial crisis. The modifications of the weights of these financial criteria's are shown in the Table 1.

Table 1: The weight of Financial Criteria's

First Data Set (2002-2007)		Second Data Set (2008-2012)	
Criteria's	Weights	Criteria's	Weights
Equity/Total Assets	0,10	Equity/Total Assets	0,25
Total Deposit/ Total Assets	0,10	Total Deposit/ Total Assets	0,05
Total Credit/Total Assets	0,10	Total Credit/Total Assets	0,05
Total Credit/Total Deposit	0,10	Total Credit/Total Deposit	0,05
Fixed Assets/Total Assets	0,10	Fixed Assets/Total Assets	0,05
Liquid Assets/Total Assets	0,10	Liquid Assets/Total Assets	0,20
Liquid Assets/Short Term Liability	0,10	Liquid Assets/Short Term Liability	0,20
Term Net Profit- Loss/ Total Assets	0,10	Term Net Profit- Loss/ Total Assets	0,05
Term Net Profit- Loss/ Equity	0,10	Term Net Profit- Loss/	0,05

		Equity	
Net Primary Income/ Total Assets	0,10	Net Primary Income/ Total Assets	0,05

Gaussian function is used for modified ten criteria's by using data of three selected public banks. The PROMETHEE method was selected because of its simplicity and its capacity to evaluate the ranking of the public banks by using criteria's as indicators for financial performances before and during global crisis.

3. ANALYSIS AND FINDINGS

Ratios for selected public banks are shown in Table 2 and Table 3.

Table 2: Companies and financial criteria's average for the period from 2002 to 2007

Criteria's	2002-2007		
	Bank A	Bank B	Bank C
Equity/Total Assets	0,099	0,11533333	0,098
Total Deposit/ Total Assets	0,78883333	0,74316667	0,712
Total Credit/Total Assets	0,1865	0,231	0,380333
Total Credit/Total Deposit	0,23333	0,304	0,54083333
Fixed Assets/Total Assets	0,023	0,0283333	0,069
Liquid Assets/Total Assets	0,3888333	0,1953333	0,48266667
Liquid Assets/Short Term Liability	0,80483333	0,4155	1,34483333
Term Net Profit- Loss/ Total Assets	0,02333333	0,0255	0,021
Term Net Profit- Loss/ Equity	0,24683333	0,2235	0,23433333
Net Primary Income/ Total Assets	0,01683333	0,02616667	0,03083333

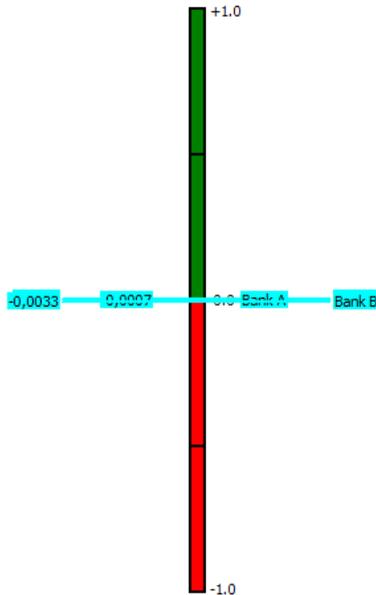
The PROMETHEE II complete ranking is based on a calculation of net outranking flow value that represents the balance between the positive and negative outranking flows. The higher the net flow, the better the alternative (Bogdanovic et.all., 2012: 84).

Table 3: Companies and financial criteria’s average for the period from 2008 to 2012

Criteria’s	2008-2012		
	Bank A	Bank B	Bank C
Equity/Total Assets	0,086	0,098	0,1114
Total Deposit/ Total Assets	0,772	0,746	0,6742
Total Credit/Total Assets	0,3708	0,5748	0,6038
Total Credit/Total Deposit	0,486	0,7726	0,8978
Fixed Assets/Total Assets	0,0146	0,0294	0,028
Liquid Assets/Total Assets	0,3236	0,1822	0,2998
Liquid Assets/Short Term Liability	0,4524	0,2956	0,5598
Term Net Profit- Loss/ Total Assets	0,0204	0,0242	0,0154
Term Net Profit- Loss/ Equity	0,2436	0,2476	0,1386
Net Primary Income/ Total Assets	0,0078	0,0148	0,0164

PROMETHEE II Complete Ranking results for the period 2002-2007 are shown in Figure 1.

Figure 1: PROMETHEE II Complete Ranking for the period 2002-2007



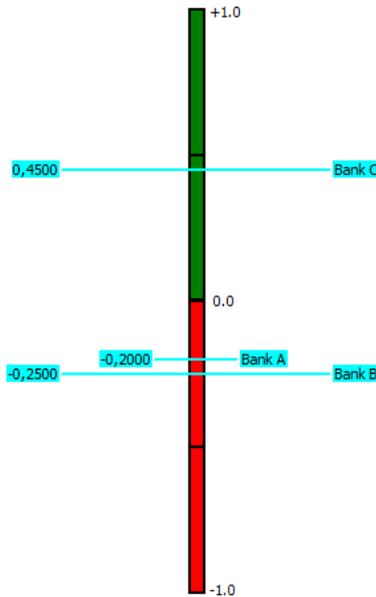
Based on the above ranking, the conclusion is that Bank C (0,0040) was ranked as the first and the others are respectively: Bank A (-0,0007) and Bank B (-0,0033). The results are shown in Table 4.

Table 4: PROMETHEE flows for the period 2002-2007

Action	Phi	Phi+	Phi-
Bank C	0,0040	0,0040	0,0000
Bank A	-0,0007	0,0005	0,0012
Bank B	-0,0033	0,0000	0,0033

The best alternative is identified by PROMETHEE II complete ranking (Fig. 1.) for the period 2002-2007. Net flow values given in the first column of Table 4 are used in this process. Bank C is selected as the best alternative, based on the information provided by PROMETHEE II, and the others are respectively: Bank A and Bank B. PROMETHEE II Complete Ranking results for the period 2008-2012 are shown in Figure 2.

Figure 2: PROMETHEE II Complete Ranking for the period 2008-2012



Based on the above ranking, the conclusion is that Bank C (0,0045) was ranked as the first and the others are respectively: Bank A (-0,2000) and Bank B(-0,2500). The results are shown in Table 5.

Table 5: PROMETHEE flows for the period 2008-2012

Action	Phi	Phi+	Phi-
Bank C	0,4500	0,7250	0,2750
Bank A	-0,2000	0,4000	0,6000
Bank B	-0,2500	0,3750	0,6250

Bank C is selected as the best alternative based on the information provided by PROMETHEE II, and the others are respectively Bank A and Bank B. Net flow values given in the first column of Table 5 are used in this process.

4. CONCLUSION

PROMETHEE method is used in this paper in order to evaluate the ranking of the public banks in Turkey by using criteria's as indicators for measuring their financial performance. Bank C is selected as the best alternative based on the information provided by PROMETHEE II, and the others are respectively: Bank A and Bank B for the period 2002-2007 and Bank C is selected as the best alternative based on the information provided by PROMETHEE II, and the others are respectively: Bank A and Bank B for the period 2008-2012. Each period was searched in order to determine if a global financial crisis affects financial performance of public banks or not. As a result, rankings are the same for the period 2002-2007 and 2008-2012. Global crisis didn't affect public banks in Turkey directly because public banks have strong liquidity position and capital adequacy.

Application of this study is identified to the relative period of time and different results may be achieved by using different time period and model.

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