THE RELATIONSHIP BETWEEN CORPORATE GOVERNANCE COMPLIANCE RATINGS AND FINANCIAL PERFORMANCE: AN INVESTIGATION ON BANKS LISTED IN BORSA ISTANBUL CORPORATE GOVERNANCE INDEX

Isil EREM
Usak University, Faculty of Economics and Administrative Sciences, 64000, Turkey
isil.erem@usak.edu.tr

Abstract
The aim of this study is to determine the efficiency and financial performance levels of six banks listed in Borsa Istanbul (BIST) Corporate Governance Index by using DEA (Data Envelopment Analysis) and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) methods which are Multi Criteria Decision Making Models and to compare the obtained scores with the corporate governance compliance scores that banks take from several credit rating agencies. In applying DEA and TOPSIS methods; DEA-Solver-LV (Data Envelopment Analysis Solver), a special software, and Microsoft Office Excel program are used. The financial ratios considered as financial performance indicators are determined according to the related literature and banks are ranked by measuring their efficiency and performance levels. After these scores are determined, the findings are evaluated by comparing with the corporate governance compliance scores. According to the findings; it is seen that the banks' efficiency scores and financial performance rankings do not show parallelism with the corporate governance compliance scores completely.

Keywords: *BIST Corporate Governance Index, Corporate Governance Compliance Ratings, Data Envelopment Analysis Method, TOPSIS Method.*

JEL Classification: *G21, G30, L25, O16.*

I. INTRODUCTION

Corporate Governance involves the relationships among the management, board of directors, shareholders and other stakeholders of a company. Effective corporate governance practices have a directive qualification in determining how the companies' targets and performance should be monitored (G20/OECD Corporate Governance Principles, 2015, p. 9). Worldwide privatizations made recently, retirement fund reforms, increase in the level of personal savings, hostile takeovers in 1980s, 1997 Asian financial crisis and corporate scandals occurred in United States of America are among the reasons of increasing importance of corporate governance present day (Kula, 2006, p.48).

Fulfilling the corporate governance practices effectively is of great significance in banking sector or financial system. Banks carry on their activities by the deposits that they collect from their customers by contrast with the real-sector companies that they get their finance substantially from their shareholders. So, this situation requires the management of funds reliably. On the other hand; banks fulfill several brokerage operations in financing the economic activities of companies operating in other sectors. Besides that, banks are important parts of payment mechanism country-wide and at an international level by several financial instruments such as deposit accounts, fund transfers, credit cards. Additionally; belief and confidence in banks are of great significance in providing stability for national economies. When examined the previous periods; bank failures occurred in several countries have shown that any decrease in the confidence in banks may cause systemic banking crises (Cabraal, 2007, pp. 2-3).

In this study; efficiency and financial performance levels of six banks listed in BIST Corporate Governance Index are determined by the methods of DEA and TOPSIS for the years of 2014 and 2015, then the obtained scores are analyzed by comparing with the Corporate Governance scores of the so-called banks. In this context; firstly the studies evaluating the banking sector by multi-criteria decision-making techniques in national and international literature are considered, then the studies investigating the relationship between corporate governance practices and financial performance are specified. Finally the context of study and the used methods are mentioned and the obtained results are analyzed.

II. LITERATURE REVIEW

It is seen that various methods have been used in measuring the levels of efficiency and financial performance throughout the banking sector in literature. While ratio analysis and CAMELS analysis are the traditional performance measurement methods; various methods such as DEA, TOPSIS, AHP, AHS and PROMETHEE are also used frequently. The studies made as to efficiency measurement and performance evaluation for banking sector in national and international literature are as follows:

Table 1. The Studies as to Efficiency Measurement and Performance Evaluation in Banking Sector

Author	Period	Sample	Method
Almumani (2013)	2007-2011	10 public capital banks operating in Saudi Arabia banking sector	DEA
Ayaydin et al. (2015)	2011-2013	15 banks operating in Turkish banking sector	AHS and TOPSIS
Atan ve Catalbas (2005)	2002-2004	3 public, 18 private and 12 foreign capital banks operating in Turkish banking sector	DEA
Timor and Mimarbasi (2013)	2010	15 branches of a private bank operating in Turkey	DEA and TOPSIS
Dincer ve Gorener (2011)	2008	Public, private and foreign capital Turkish banks	AHP, VIKOR and TOPSIS
Gundogdu (2015)	2003-2013	10 foreign-capital Turkish banks	TOPSIS
Akkoc and Vatansever (2013)	2010	12 commercial banks operating in Turkey	AHP and TOPSIS
Tunay and Akhisar (2015)	2009-2013	21 private-capital Turkish banks	AHP and TOPSIS
Demireli (2010)	2001-2007	3 public capital Turkish banks	TOPSIS
Onder et al. (2013)	2002-2011	3 public, 9 private and 5 foreign capital Turkish banks	AHP and TOPSIS
Ustasuleyman (2009)	-	3 commercial banks operating in Turkey	AHS and TOPSIS
Mandic et al. (2014)	2005-2010	35 commercial banks operating in Serbia	AHP and TOPSIS
Wanke et al. (2016)	2009-2013	10 public and 6 foreign capital participation banks operating in Malaysia	TOPSIS and Artificial Neural Networks
Secme et al. (2009)	2007	The biggest 5 commercial banks operating in Turkey	AHP and TOPSIS
Hunjak and Jakovčević (2001)	1999	Banks operating in Croatian banking sector	AHP
Sakarya and Aytekin (2013)	2007-2011	12 deposit banks operating in Turkey	PROMETHEE
Ozdemir and Demireli (2013)	2011-2012	Deposit banks and Development and Investment banks operating in Turkey	DEA
Budak (2011)	2008-2010	22 commercial banks operating in Turkey	DEA
Seyrek and Ata (2010)	2003-2008	20 deposit banks operating in Turkey	DEA and Data Mining
Kucukaksoy and Onal	2004-2011	10 private and 5 foreign capital deposit banks operating in Turkey	DEA
Behdioglu and Ozcan (2009)	1999-2005	29 commercial banks operating in Turkey	DEA

When considered both the national and foreign studies as to determining the relationship corporate governance and financial performance; it is seen that corporate governance practices have a great importance on the level of financial performance and that these factors show parallelism with each other (Del Brio et al, 2006; Major and Marquesl, 2008; Kara et al, 2015; Suer and Koseoglu, 2012; Yenice and Dolen, 2013; Berthelot et al, 2010; Ergin, 2012). On the other hand; some studies show that corporate governance practices don't have a direct effect on financial performance (Ege et al., 2013; Esendemirli and Acar, 2016; Conkar et al, 2011).

III. METHODOLOGY

In this study; it is aimed that the efficiency and financial performance levels of six banks listed in BIST Corporate Governance Index are determined by DEA and TOPSIS methods for 2014 and 2015 years, then the relationship between the obtained results and corporate governance scores that banks take from several rating institutions has been evaluated. As a result of the literature review; it is seen that several financial ratios are used in efficiency and financial performance measurement.

TOPSIS Method

TOPSIS, one of the methods used in decision making process, is a multi-criteria decision making technique enabling the best selection among the alternatives. This method was developed by Hwang and Yoon in 1981. TOPSIS word constitutes of the first letters of Technique for Order Preference by Similarity to Ideal Solution words.

The gradation of alternatives is made by TOPSIS method in accordance with certain criteria. In the first step of this method; decision matrix is generated. After this step, this decision matrix is weighted by obtaining normalized decision matrix with reference to decision matrix. Later, the shortest geometric distance from the positive ideal solution and the longest geometric distance from the negative ideal solution are determined. Finally, the alternatives are sorted by calculating the relative scores of each alternative (Yildirim and Onder, 2015, pp.134-135). In this study; financial ratios used in TOPSIS method are as follows:

Table 2- Financial Ratios Used in TOPSIS Method and Weight

Financial Ratios	Weight
Equity/Total Assets	0,083
(Equity-Fixed Assets)/ Total Assets	0,083
(TRY Credits and Receivables)/(Total Credits and Receivables)	0,083
(Total Credits and Receivables)/ Total Assets	0,083
Liquid Assets/Total Assets	0,083
Net Profit-Loss for the Year/ Total Assets	0,083
Profit Before Tax/ Total Assets	0,083
Interest Income/Interest Expenses	0,083
Net Profit-Loss for the Year/ Equity	0,083
Interest Income/ Total Assets	0,083
Interest Income//Total Operating Income	0,083
Non-Performing Loans/(Total Credits and Receivables)	0,083

The evaluated criteria should be weighted in the significance level that decision maker places importance on the related criterion in connection with the application of TOPSIS method. In this study; the evaluated twelve financial ratios are weighted equally as 0,083.

Data Envelopment Analysis (DEA)

Considering the digitized approaches provides some advantages in measuring the efficiency. The first of these advantages is to make comparison among the similar economic units and to make relative efficiency analysis enabling decision making. The second one is to determine the variation rotation and size of economic units' efficiencies. At the same time, it is essential to investigate the basic findings that have importance in terms of both firm managers and planners by determining the factors causing this variation. The third one is to contribute to generate policy aiming at conditioning the obtained efficiency parametres from these analyses. Data envelopment analysis method is a linear programming method frequently used in measuring the variation in productivity and efficiency. The feature of this method is to generate a reference criterion (Kok and Deliktas, 2003, pp.219-220).

Non-performing loans and interest expenses or dividend expenses are used as input and total loans rate is used as output in DEA method either. Because the number of decision making units should be two times more than the sum of inputs and outputs, the number of inputs and outputs is cramped (Yildirim and Onder, 2015, p.206).

Corporate Governance Compliance Scores

Banks play a significant role in terms of their functions of intermediation, funding and leading the national economies. In proper functioning of the banking sector, complying with the corporate governance principles is of great importance. These principles provide banks with setting banks' strategies, operating the banks' business on a day-to-day basis, protecting the rights of stakeholders and establishing control functions (Bank for International Settlements, 2015, p. 3).

BIST Corporate Governance Index aims to measure the price and return performances of companies traded on Borsa İstanbul Markets (except companies in Watch List and Lists C and D) with a corporate governance rating of minimum 7 over 10 as a whole and minimum of 6.5 for each main section. Corporate governance compliance scores are given as a result of the evaluations made as to the companies' accordance

with each corporate governance principle by the credit rating agencies that considered by Capital Market Board (http://www.borsaistanbul.com/endeksler/bist-pay-endeksleri/kurumsal-yonetim-endeksi).

The banks investigated in this study, the credit rating agencies and corporate governance compliance scores of these banks for the years of 2014 and 2015 are as follows:

Table3-Banks listed in BIST Corporate Governance Index

Abbreviation	Banks	Credit Rating Agency	Compliance Score (2014)	Compliance Score (2015)
G1	Albaraka Turk	JCR Eurasia Rating	8.44	8.59
G2	GarantiBank	JCR Eurasia Rating	9.14	9.20
G3	Halkbank	Saha Ratings	9.19	9.26
G4	Sekerbank	Kobirate International Credit Rating and Corporate Governance Service Inc.	9.11	9.17
G5	Industrial Development Bank of Turkey	Saha Ratings	9.44	9.52
G6	Yapi Kredi Bank	Saha Ratings	9.25	9.34

Source:*https://www.kap.gov.tr/sirketler/islem-goren-sirketler/endeksler.aspx#BIST KURUMSAL YÖNETİM|8, http://www.saharating.com/, http://www.kobirate.com.tr/, http://www.jcrer.com.tr/(Date Accessed: 15.03.2016).*

IV. FINDINGS, COMMENTS

Performance Gradation According to TOPSIS Method

Six banks are analyzed as decision-making units and twelve financial ratios have been used as evaluation criterion in applying TOPSIS method for 2014 and 2015 years. For serving as a model, the results obtained from TOPSIS method for 2014 are shown in Table 4-5-6-7-8-9:

Table4-Decision Matrix

Weight	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083
(2014)	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**A12**
G1	0,078	0,055	0,872	0,6724	0,021	0,136	0,011	0,014	1,871	0,139	0,065	1,536
G2	0,119	0,112	0,638	0,6124	0,025	0,115	0,015	0,019	1,974	0,123	0,069	1,412
G3	0,101	0,089	0,728	0,6471	0,037	0,129	0,015	0,018	1,835	0,145	0,074	1,567
G4	0,111	0,065	0,869	0,6647	0,059	0,105	0,011	0,014	1,907	0,100	0,101	1,521
G5	0,149	0,148	0,222	0,6697	0,002	0,031	0,023	0,029	2,815	0,154	0,051	1,241
G6	0,104	0,091	0,668	0,6504	0,035	0,119	0,011	0,014	1,897	0,102	0,065	1,450

In the next step; the normalized decision matrix is calculated:

Table5-Normalized Decision Matrix

(2014)	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**A12**
G1	0,282	0,23	0,508	0,4203	0,252	0,498	0,298	0,305	0,367	0,44	0,367	0,43
G2	0,432	0,465	0,371	0,3828	0,294	0,419	0,404	0,416	0,388	0,39	0,388	0,395
G3	0,365	0,372	0,424	0,4045	0,436	0,473	0,402	0,396	0,36	0,458	0,419	0,439
G4	0,404	0,27	0,506	0,4155	0,7	0,386	0,308	0,302	0,375	0,317	0,57	0,426
G5	0,543	0,615	0,129	0,4186	0,02	0,115	0,638	0,629	0,553	0,489	0,285	0,347
G6	0,377	0,377	0,389	0,4066	0,412	0,436	0,292	0,3	0,373	0,322	0,365	0,406

In Table 6; the weighted normalized decision matrix is determined:

Table 6- Weighted Normalized Decision Matrix

(2014)	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
G1	0,023	0,019	0,042	0,035	0,021	0,041	0,025	0,025	0,031	0,037	0,030	0,036
G2	0,036	0,039	0,031	0,032	0,024	0,035	0,034	0,035	0,032	0,032	0,032	0,033
G3	0,030	0,031	0,035	0,034	0,036	0,039	0,033	0,033	0,030	0,038	0,035	0,036
G4	0,034	0,022	0,042	0,034	0,058	0,032	0,026	0,025	0,031	0,026	0,047	0,035
G5	0,045	0,051	0,011	0,035	0,002	0,010	0,053	0,052	0,046	0,041	0,024	0,029
G6	0,031	0,031	0,032	0,034	0,034	0,036	0,024	0,025	0,031	0,027	0,030	0,034

The positive and negative ideal solution values respectively are as follows:

Table 7-Positive and Negative Ideal Solutions

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
Positive Ideal Solutions	0,045	0,051	0,042	0,035	0,058	0,041	0,053	0,052	0,046	0,041	0,047	0,036
Negative Ideal Solutions	0,023	0,019	0,011	0,032	0,002	0,01	0,024	0,025	0,03	0,026	0,024	0,029

The positive and negative ideal solutions matrix is determined in Table 8:

Table 8- Positive and Negative Ideal Solutions Matrix

Positive Ideal Solutions												
	A1	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**A12**
G1	0,005	0,011	0	0	0,013	0	0,007	0,007	0,002	0,001	0,003	0,005
G2	0,008	0,002	0,001	0,009	0,011	0,004	0,004	0,003	0,001	0,002	0,002	0,001
G3	0,002	0,004	0,004	0,007	0,005	0,005	0,003	0,004	0,003	0,006	0,001	0
G4	0,001	0,008	0,001	0,005	0	0,008	0,008	0,007	0,002	0,002	0	0,002
G5	0	0	0,009	0,008	0,032	0,012	0	0	0	0	0,006	0,005
G6	0,002	0,004	0,009	0,003	0,006	0,002	0,009	0,008	0,002	0,001	0,003	0,006
Negative Ideal Solutions												
G1	0	0	0,009	0,001	0,003	0,001	0,002	0,002	0,006	0,008	0,006	0,002
G2	0,002	0,004	0,004	0	0,005	0,006	0,001	0,006	0,008	0,005	0,007	0,007
G3	0,001	0,002	0,006	0,003	0,002	0,001	0,008	0,009	0,005	0,003	0,009	0,006
G4	0,006	0,002	0,009	0,002	0,003	0,001	0,001	0,003	0	0	0,006	0,004
G5	0,008	0,011	0	0,001	0	0	0,008	0,007	0,007	0,009	0	0
G6	0,007	0,001	0,004	0,006	0,001	0,007	0	0	0,006	0,007	0,005	0,002

After calculating the positive and negative ideal solutions matrix; ideal solution values (C*) are determined by the formula of [(S+)/(S--S+)]:

Table 9- TOPSIS Gradation for 2014 and 2015

2014	Si+	Si-	Ci	Gradation	2015	Si+	Si-	Ci	Gradation
G1	0,0701	0,0531	0,4306	5	**G1**	0,1775	0,0632	0,2625	2
G2	0,0524	0,0509	0,4929	3	**G2**	0,1758	0,0541	0,2354	5
G3	0,0483	0,0599	0,5533	2	**G3**	0,1750	0,0582	0,2493	4
G4	0,0543	0,0749	0,5797	1	**G4**	0,1825	0,0639	0,2594	3
G5	0,0762	0,0572	0,4213	6	**G5**	0,0776	0,1822	0,7014	1
G6	0,0597	0,0523	0,4673	4	**G6**	0,1785	0,0492	0,2162	6

Banks' Efficiency Scores According to DEA Method

In this study considering non-performing loans and interest & dividend expenses rate as inputs and total credits rate as output; the efficiency scores and gradation of the listed banks are as follows:

Table 10- DEA Efficiency Scores and Gradation

	Decision Unit	Score	Gradation		Decision Unit	Score	Gradation
2014	**G1**	0,51692	2	**2015**	G1	0,65037	3
	G2	0,47017	4		G2	0,71388	2
	G3	0,42747	5		G3	0,58064	5
	G4	0,33578	6		G4	0,47828	6
	G5	1	1		G5	1	1
	G6	0,51032	3		G6	0,61945	4

The listed banks' gradation according to TOPSIS and DEA methods and their corporate governance compliance scores are as follows:

Table 11- Comparison of TOPSIS, DEA and Corporate Governance Compliance Scores

	2014			2015		
	TOPSIS	**DEA**	**Corporate Governance Compliance Scores**	**TOPSIS**	**DEA**	**Corporate Governance Compliance Scores**
G1	0,43063 (5)	0,51692 (2)	8.44 (6)	0,262507 (2)	0,65037 (3)	8.59 (6)
G2	0,49287 (3)	0,47017 (4)	9.14 (4)	0,235452 (5)	0,71388 (2)	9.20 (4)
G3	0,55331 (2)	0,42747 (5)	9.19 (3)	0,249364 (4)	0,58064 (5)	9.26 (3)
G4	0,57969 (1)	0,33578 (6)	9.11 (5)	0,259408 (3)	0,47828 (6)	9.17 (5)
G5	0,42129 (6)	1(1)	9.44 (1)	0,701477 (1)	1 (1)	9.52 (1)
G6	0,46726 (4)	0,51032 (3)	9.25 (2)	0,216278 (6)	0,61945 (4)	9.34 (2)

When considered Table 11; Industrial Development Bank of Turkey takes place on the top according to DEA method, Sekerbank is placed on the top according to TOPSIS method in 2014. According to corporate governance compliance scores; it is seen that Industrial Development Bank of Turkey is placed on the top. While Albaraka Turk being on the lowest position according to corporate governance compliance scores is placed on the 5th rank according to TOPSIS, it is placed on the second rank according to DEA method. While Garanti Bank is placed on 4th rank according to both DEA method and corporate governance compliance score, it is placed on the 3rd rank according to TOPSIS method. When considered Halkbank and Yapi Kredi Bank; they are placed on the different ranks in TOPSIS, DEA methods and corporate governance compliance scores.

In 2015; Industrial Development Bank of Turkey is placed on the top according to all methods of evaluation. When examined Yapi Kredi Bank, Garanti Bank, Albaraka Turk and Sekerbank; it is seen that they take place on the different ranks according to all methods. As for Halkbank; while it is placed on the third rank according to TOPSIS, it takes place on the 4th rank according to DEA method.

When made a general evaluation; it is seen that there is no noticeable change in the gradation of the listed banks according to DEA method and corporate governance compliance scores in 2014 and 2015. As for TOPSIS method; the findings show that there are some differences in the banks' gradation by years. For instance; while Industrial Development Bank of Turkey is placed on the lowest rank in 2014, it comes up the first rank in 2015. Sekerbank being placed on the first rank in 2014 goes back to the 3rd rank in 2015. It is understood from the main findings; the efficiency scores, financial performance gradations and corporate governance compliance scores do not show parallelism with each other completely. Only Industrial Development Bank of Turkey is placed on the top in terms of efficiency and corporate governance compliance score in both 2014 and 2015.

V. CONCLUSION

Six banks listed in Corporate Governance Index are evaluated for the years of 2014 and 2015 in this study that investigate the relationship between corporate governance compliance scores and financial performance levels.

In measuring the efficiency levels of the listed banks; DEA method has been used and TOPSIS method is used in evaluating their financial performance levels. While non-performing loans and interest expenses & dividend expenses are used as inputs; total loans rate is used as output in DEA method. Twelve different financial ratios have been used in TOPSIS method either. For further studies; it is possible to use other multi-criteria decision-making models and more different methods may be used in weighting the criteria.

It is seen that there isn't a direct relationship between the corporate governance compliance scores and financial performance & efficiency levels of the listed banks as of periods and variables. At this point; the fact that the listed banks evaluated by the different credit rating agencies according to different criteria may be the

reason of this difference. It is possible to say that an increase in the number of the banks listed in Corporate Governance Index or a standardization in evaluation criteria of the credit rating agencies or adding new variables for analyzing the efficiency and performance levels may provide more consistent results.

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