

Measuring Commercial Banks' Performances in Turkey: A Proposed Model

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Abstract

This study considers financial performances of commercial banks of Turkey in the period of 2003 and 2010. The financial performance of banks is measured using an indexing model developed in this study. The model considers fundamental performance characteristics of banks and chooses related explanatory factors determining these characteristics. The study covers 13 commercial banks of Turkey listed in Istanbul Stock Exchange. All banks for each year are ranked by employing the proposed indexing model. Moreover, the results of proposed performance measurement system are compared to annual net income and ROE of banks.

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1 Introduction

Performance measurement systems are considered to be important for evaluating the accomplishments of firm goals, constructing strategies for development, making decisions for investments and compensating managers. This study develops a performance measurement index to rank the Turkish commercial banks based solely on their financial performances in the period of 2003 and 2010. There are 25 commercial banks currently operating in Turkey. Thirteen of these banks are listed and traded in Istanbul Stock Exchange in the period of 2003 and 2010. The publicly available financial data of banks are used and all data are observed from the web pages of Turkish Banks Association. Annual balance sheets, income statements and related footnotes of all banks under consideration are utilized to determine the financial performances of banks.

The study is organized as follows. The following part covers the related literature. The next section presents the methodology and data used in this study. The empirical findings are discussed in section four. The final part provides concluding remarks.

2 Literature Survey

A number of studies in literature have investigated banks' performance by using variety of approaches. Kaplan and Norton (1992) used balanced scorecard method to measure business performance. The balanced scorecard method includes both financial and nonfinancial measures such as institutional learning process, growth, internal business processes, customer-employee satisfaction etc.

Kraft and Tirgiroglu (1998) employed data envelopment analysis to measure the bank performance in Croatia in the years 1994 and 1995. They found that new banks show better performance than old banks and the profitability is negatively correlated to X-efficiency. Avkiran (1999) examine the banks' efficiency in Australia in the period of 1986 and 1995. He stated that the bank efficiency rises slowly and steadily over years. Chen and Yeh (2000) study indicated that Taiwanese privatized government owned banks are less efficient than private banks in the year 1986. Hwag, Lee, Lin and Ouyang (2009) took into consideration of both financial and nonfinancial performances when evaluating 35 sampled publicly traded commercial banks in Taiwan. The banks are classified based on the year founded and the type of major stockholders. They found that the privatized government owned banks have significantly performed better than private banks. New and old banks are not significantly different from each other in both financial and nonfinancial performance indexes. They concluded that more branch offices, better capital structure and solvency, higher growth in deposits and loans result in more profits, and lead to higher customer satisfaction and more efficient management.

The related literature presents a strong interest on evaluation of banks' performances in all countries. This study intends to rank all Turkish banks listed in Istanbul Stock Exchange in the period of 2003 and 2010.

3 Data and Methodology

Time series panel data of 13 commercial banks listed in Istanbul Stock Exchange and operating in Turkey in the period of 2003 and 2010 are employed. All observations are annual and show the year end values. All financial data used in this study are publicly available and collected from the web pages of Turkish Banks Association.

The financial performance measures of banks consist mostly of commonly used ratios, easily and publicly accessible balance sheet, income statement and related footnote information. By examining the related literature, six different characteristics are defined as the financial performance components for banks. Then, several factors are identified measuring each of these performance characteristics.

The financial performance of a bank is generally depended on its management efficiency, profitability, liquidity (solvency), capital adequacy, asset quality and growth. The first category of the financial performance index is management efficiency, which is determined by three ratios, namely; profit per bank branch, profit per employee, noninterest income / noninterest expense. The second category is profitability measured by three ratios, namely; net income / stockholders equity, net income / total assets and net interest income / earning assets. The next category is liquidity which is measured by liquidity indicator. The liquidity indicator is defined as the difference between the addition of cash and cash equivalents, deposits in other banks, securities available for sale, trading securities and receivables from money markets and the additions of 1-month deposits, demand deposits and payables to money markets. The fourth category is the capital adequacy measured by the capital adequacy standard ratio (Basel II). The fifth financial performance category is asset quality measured by the ratio of nonperforming loans / total loans. The last category is growth measured by the growth rate of deposits and loans. Table 1 presents the performance characteristics for banks and the factors defining these characteristics. Table 1 also presents the weights of performance characteristics and factors determined by a survey study among the banking sector professionals.

For intertemporal and cross-sectional comparisons of each measure, the values for all individual banks are standardized. The standardized values are calculated as follows;

$$Z_{ijt} = (\beta_{ijt} - \mu_{jt}) / \sigma_{jt}$$

Where μ_{jt} and σ_{jt} are the sample mean and standard deviation, respectively, of the j th factor at time t . β_{ijt} is the j^{th} factor of bank i at time t . If the standardized value (Z_{ijt}) is greater than zero, it means that bank i is relatively better at time t than the average in terms of j^{th} factor.

Table 1: Performance characteristics and performance factors for banks

Performance Characteristics	Weight	Performance Factors	Weight
Management Efficiency	10%	Profit per Branch Profit per Employee Noninterest Inc./Noninterest Exp.	20% 40% 40%
Profitability	25%	Net Income / Equity Net Income / Assets Net Interest Inc. / (Loans + Securities)	50% 30% 20%
Liquidity	10%	Liquidity Indicator =(cash+cash equiv.+deposits in banks+sec. available for sale and trading receivables from money markets) / (demand deposits+1-mo deposits+payables to money markets)	100%
Capital Adequacy	10%	Capital Adequacy Ratio = Capital Base / (Market+Credit+Oper.risks) Capital Ratio =Equity / Assets	80% 20%
Asset Quality	10%	Nonperforming Loans / Loans	100%
Growth	10%	Growth of Deposits Growth of Loans	50% 50%
Market Value	25%	Market Value of Stocks / Equity	100%

The performance index of each financial characteristic is constructed by calculating weighted averages of relevant standardized factors with predetermined weights. The performance index represents the relative importance of each category. The weights are determined according to their relative impact based on the surveys of experts in the banking sector. The evaluation of weights of performance characteristics by banking experts are averaged and rounded to the nearest percentage points. The weights used in this analysis are as follows; 10%

for management efficiency, 25% for profitability, 10% for liquidity, 10% for capital adequacy, 10% for asset quality, 10% for growth and 25% for market value.

Each of the bank performance index characteristic for each year is calculated as follows;

$$\text{Management Efficiency } ME_{it} = W_{1it} Z_{1it} + W_{2it} Z_{2it} + W_{3it} Z_{3it}$$

$$\text{Profitability } PR_{it} = W_{1it} Z_{1it} + W_{2it} Z_{2it} + W_{3it} Z_{3it}$$

$$\text{Liquidity } LQ_{it} = W_{1it} Z_{1it}$$

$$\text{Capital Adequacy } CA_{it} = W_{1it} Z_{1it} + W_{2it} Z_{2it}$$

$$\text{Asset Quality } AQ_{it} = W_{1it} Z_{1it}$$

$$\text{Growth } GR_{it} = W_{1it} Z_{1it} + W_{2it} Z_{2it}$$

$$\text{Market Value } MV_{it} = W_{1it} Z_{1it}$$

Where Z_{it} is the standardized performance factor for i^{th} bank at time t , W_{it} is the predetermined weight for all banks and all times. The weights of performance factors are determined according to their relative impact based on the surveys of experts in the banking sector. The survey results are averaged and rounded to the nearest percentage points. The weights of performance factors used in this analysis are shown in Table 1.

Finally, overall financial performance index of each bank for each year is calculated as the weighted average of performance indexes of management efficiency, profitability, liquidity, capital adequacy, asset quality, growth and market value. The financial performance index (PI) calculated is shown as below;

$$PI = \alpha_{j1} ME_{it} + \alpha_{j2} PR_{it} + \alpha_{j3} LQ_{it} + \alpha_{j4} CA_{it} + \alpha_{j5} AQ_{it} + \alpha_{j6} GR_{it} + \alpha_{j7} MV_{it}$$

Where α_j is the predetermined weight for all banks and all times, and ME_{it} , PR_{it} , LQ_{it} , CA_{it} , AQ_{it} , GR_{it} , MV_{it} are the performance characteristics of the i^{th} bank for time t .

The relative financial performance of each bank is compared to that of the peers and all banks are ranked by PI values for each year. The following section presents and evaluates the findings of performance measurement index.

4 Empirical Findings and Evaluations

This section presents the findings of the proposed performance measurement model for banks. The tables below show the results of performance index computations of 13 Turkish commercial banks listed in ISE for the years 2003 through 2010. These results are then compared to the rankings of banks for total equity, asset size, net income and return on investment (ROE) ratio.

Table 2 presents the total assets, total equity and annual net income values as well as computed ROE and PI for the 13 banks examined for the year 2010. All banks under examination are ranked for both observed and computed variables. Isbank has the largest asset size and produced the second greatest annual net income for year 2010 but it is ranked as 3rd and 5th in terms of performance index and ROE, respectively. Similarly, Garantibank has second highest asset size and the greatest net income and the 3rd highest ROE but Garantibank is ranked as the second best performer in terms of performance index. Akbank has the greatest equity, 3rd highest net income and 7th best ROE but it is ranked as the best performer by performance index.

Table 2: Empirical results for 2010 (million TL)

	Banks	Assets	Rank	Equity	Rank	Net Inc	Rank	ROE	Rank	PI	Rank
1	Akbank	113183	3	17565	1	2857	3	16.3	7	0.74	1
2	Alternatifbank	4259	12	462	13	28	11	6.0	11	-1.05	13
3	Denizbank	27660	8	3141	8	458	8	14.6	8	0.30	7
4	Finansbank	38087	7	5208	7	915	7	17.6	4	0.09	8
5	Fortisbank	12133	10	1925	9	22	12	1.2	13	-0.28	9
6	Garantibank	123963	2	16475	3	3145	1	19.1	3	0.64	2
7	Halkbank	72942	6	7445	6	2010	5	27.0	1	0.45	4
8	Isbank	131796	1	17014	2	2982	2	17.5	5	0.64	3
9	Sekerbank	11369	11	1400	11	170	10	12.2	10	-0.67	11
10	TEB	19031	9	1813	10	300	9	16.6	6	0.37	5
11	Tekstilbank	2573	13	496	12	14	13	2.9	12	-0.79	12
12	Vakifbank	73962	5	8559	5	1157	6	13.5	9	-0.48	10
13	YapiKredi	84776	4	10318	4	2060	4	20.0	2	0.33	6
	Average	55057		7063		1240		14.2		0.02	

Table 3 shows the performance results for the year 2009. Garantibank reports the highest net income and 2nd highest ROE but it is ranked as the best performer by PI. Akbank has the greatest equity, 2nd highest net income and 4th best ROE for the year but it is ranked as 2nd best performer by PI. TEB is ranked as the 3rd best performer although it has the 10th highest ROE for the year.

Table 3: Empirical results for 2009 (million TL)

Banks	Assets	Rank	Equity	Rank	Net Inc	Rank	ROE	Rank	PI	Rank
1 Akbank	95309	3	14191	1	2726	2	19.2	4	0.52	2
2 Alternatifbank	3629	12	435	13	62	12	14.2	9	-0.74	13
3 Denizbank	21205	8	2630	8	532	8	20.2	3	0.30	6
4 Finansbank	29318	7	3627	7	650	7	17.9	5	0.02	8
5 Fortisbank	11274	10	1961	9	111	11	5.7	12	-0.26	9
6 Garantibank	105462	2	13316	3	2962	1	22.2	2	0.71	1
7 Halkbank	60650	6	5760	6	1631	4	28.3	1	0.45	4
8 Isbank	113223	1	13494	2	2372	3	17.6	6	0.41	5
9 Sekerbank	8955	11	1249	11	152	10	12.2	11	-0.62	11
10 TEB	15064	9	1649	10	210	9	12.7	10	0.49	3
11 Tekstilbank	2133	13	468	12	13	13	2.8	13	-0.73	12
12 Vakifbank	64798	4	7381	5	1251	6	17.0	7	0.02	7
13 YapiKredi	64560	5	8267	4	1355	5	16.4	8	-0.28	10
Average	45814		5725		1079		15.88		0.02	

Table 4 presents the performance results for the year 2008. Although Isbank has the 3rd largest equity, net income and ROE, it is the best performer by PI. Garantibank has the highest net income and the 2nd highest ROE, and it is ranked as the 2nd best performer by PI. Akbank has the 2nd highest equity and the 5th best ROE but it is the 3rd best performer by PI.

Table 5 presents the performance results for the year 2007. Garantibank has the 3rd largest equity and total assets but it has highest net income and ROE and it is the best performer by PI. Although TEB has the 10 th highest net income

and ROE, it is 3rd best performer. Akbank has the 2nd highest net income and 6th highest ROE but it is ranked as the 3rd best performer.

Table 4: Empirical results for 2008 (million TL)

Banks	Assets	Rank	Equity	Rank	Net Inc	Rank	ROE	Rank	PI	Rank
1 Akbank	85655	3	11208	1	1705	2	15.21	5	0.44	3
2 Alternatifbank	3745	12	375	13	53	12	14.13	7	-0.29	10
3 Denizbank	19225	8	2034	8	278	8	13.67	8	0.20	5
4 Finansbank	26573	7	2840	7	363	7	12.77	10	0.10	7
5 Fortisbank	11915	10	1805	9	145	10	8.01	12	-0.26	9
6 Garantibank	88941	2	9469	2	1750	1	18.49	2	0.45	2
7 Halkbank	51096	6	4289	6	1018	5	23.74	1	0.11	6
8 Isbank	97552	1	9449	3	1509	3	15.97	3	0.63	1
9 Sekerbank	8041	11	975	11	144	11	14.80	6	-0.42	12
10 TEB	14736	9	1424	10	164	9	11.53	11	0.29	4
11 Tekstilbank	2953	13	450	12	13	13	2.80	13	-0.84	13
12 Vakifbank	52193	5	5671	5	753	6	13.28	9	-0.40	11
13 YapiKredi	63723	4	6853	4	1043	4	15.21	4	0.09	8
Average	40488		4372		688		13.82		0.01	

Table 5: Empirical results for 2007 (million TL)

Banks	Assets	R	Equity	R	Net Inc	R	ROE	R	PI	R
1 Akbank	68205	2	10601	2	1994	2	18.81	6	0.33	3
2 Alternatifbank	2597	13	244	13	63	12	25.91	2	0.08	7
3 Denizbank	14912	8	1455	9	211	8	14.52	8	-0.33	11
4 Finansbank	20882	7	2626	7	553	7	21.05	4	-0.20	10
5 Fortisbank	9891	10	1649	8	150	9	9.10	13	-0.07	8
6 Garantibank	67578	3	6883	3	2316	1	33.64	1	0.64	1
7 Halkbank	40234	6	4383	6	1131	4	25.80	3	0.30	4
8 Isbank	80181	1	10604	1	1702	3	16.05	7	0.28	5
9 Sekerbank	6088	11	865	11	123	11	14.21	11	0.14	6
10 TEB	11801	9	910	10	130	10	14.31	10	0.51	2
11 Tekstilbank	2902	12	380	12	42	13	11.16	12	-0.50	12
12 Vakifbank	42408	5	5226	4	1031	5	19.72	5	-0.08	9
13 YapiKredi	50353	4	4904	5	709	6	14.46	9	-0.76	13
Average	32157		3902		781		18.36		0.02	

Table 6 presents the performance results for the year 2006. Finansbank has the 6th largest net income and 1st highest ROE and is the best performer by PI. TEB is the 2nd and Fortisbank is the 3rd best performer for the year.

Table 6: Empirical results for 2006 (million TL)

Banks	Assets	R	Equity	R	Net Inc	R	ROE	R	PI	R
1 Akbank	57273	2	7065	2	1600	1	22.65	4	0.34	5
2 Alternatifbank	1972	13	182	13	30	12	16.26	8	0.00	8
3 Denizbank	11493	8	1236	8	276	8	22.35	5	0.28	6
4 Finansbank	17895	7	2155	7	741	6	34.39	1	0.79	1
5 Fortisbank	8644	9	1115	9	75	10	6.77	12	0.39	3
6 Garantibank	50287	3	4670	3	1064	3	22.78	3	-0.08	9
7 Halkbank	34425	6	3780	5	863	4	22.84	2	-0.28	10
8 Isbank	75205	1	9410	1	1109	2	11.79	11	0.36	4
9 Sekerbank	4006	11	437	11	52	11	11.90	10	-0.59	13
10 TEB	8282	10	552	10	106	9	19.15	6	0.45	2
11 Tekstilbank	2785	12	332	12	15	13	4.54	13	-0.48	12
12 Vakifbank	37034	5	4487	4	770	5	17.15	7	0.05	7
13 YapiKredi	48887	4	3344	6	512	7	15.32	9	-0.44	11
Average	27553		2982		555		17.53		0.06	

Table 7 presents the performance results for the year 2005. Isbank has the 2th largest net income and 10th highest ROE but it is the best performer by PI. TEB is the 2nd and Fortisbank is the 3rd best performer for the year.

Table 8 presents the performance results for the year 2004. Akbank has the the largest net income and 5th highest ROE but it is the best performer by PI. Isbank is the 2nd and Vakifbank is the 3rd best performer for the year.

Table 9 presents the performance results for the year 2003. Akbank has the the largest net income and 2nd highest ROE but it is the best performer by PI. Fortisbank is the 2nd and Isbank is the 3rd best performer for the year.

Table 7: Empirical results for 2005 (million TL)

	Banks	Assets	R	Equity	R	Net Inc	R	ROE	R	PI	R
1	Akbank	52385	2	6353	2	1438	1	22.64	2	0.43	4
2	Alternatifbank	1470	13	153	13	21	11	13.59	7	-0.03	10
3	Denizbank	9358	8	1048	8	201	7	19.16	3	0.14	6
4	Finansbank	12314	7	1397	7	350	6	25.08	1	0.07	7
5	Fortisbank	6817	9	1066	9	81	8	7.58	11	0.47	3
6	Garantibank	36468	3	3900	3	708	3	18.17	4	0.01	8
7	Halkbank	27053	5	3196	5	532	5	16.64	6	-0.43	11
8	Isbank	63712	1	9677	1	956	2	9.87	10	0.83	1
9	Sekerbank	3138	11	350	11	37	10	10.58	9	-0.44	12
10	TEB	5422	10	469	10	79	9	16.79	5	0.54	2
11	Tekstilbank	1959	12	166	12	10	12	6.11	12	-0.02	9
12	Vakifbank	32383	4	4261	4	535	4	12.56	8	0.36	5
13	YapiKredi	23866	6	1677	6	-2996	13	-178.64	13	-1.34	13
	Average	21257		2593		150		0.01		0.05	

Table 8: Empirical results for 2004 (million TL)

	Banks	Assets	R	Equity	R	Net Inc	R	ROE	R	PI	R
1	Akbank	34913	2	6227	2	1021	1	16.39	5	0.70	1
2	Alternatifbank	1174	13	131	13	5	11	3.91	11	-0.39	11
3	Denizbank	6705	9	855	9	123	7	14.36	6	0.01	8
4	Finansbank	8630	7	1047	7	192	6	18.30	3	0.10	5
5	Fortisbank	7140	8	989	8	107	8	10.84	8	0.18	4
6	Garantibank	26268	3	3169	4	451	5	14.22	7	-0.06	9
7	Halkbank	25709	4	3009	5	528	4	17.54	4	-0.38	10
8	Isbank	38514	1	7640	1	635	2	8.32	10	0.63	2
9	Sekerbank	3114	11	296	11	82	9	27.83	2	0.09	6
10	TEB	3566	10	394	10	34	10	8.57	9	0.02	7
11	Tekstilbank	1362	12	137	12	4	12	3.13	12	-0.55	13
12	Vakifbank	24199	6	2012	6	624	3	31.01	1	0.36	3
13	YapiKredi	24624	5	4640	3	-59	13	-1.27	13	-0.49	12
	Average	15840		2350		288		13.32		0.02	

Table 9: Empirical results for 2003

Banks	Assets	R	Equity	R	Net Inc	R	ROE	R	PI	R
1 Akbank	29484	2	5043	2	1325	1	26.27	2	1.13	1
2 Alternatifbank	1167	13	111	13	12	12	11.28	10	-0.44	12
3 Denizbank	4765	9	516	9	95	9	18.35	7	-0.13	7
4 Finansbank	5732	7	768	8	153	8	19.92	3	-0.14	8
5 Fortisbank	5228	8	876	7	172	6	19.60	5	0.52	2
6 Garantibank	22392	3	2451	5	302	4	12.30	9	-0.07	6
7 Halkbank	19361	5	2568	4	486	2	18.92	6	-0.23	9
8 Isbank	31063	1	5605	1	423	3	7.55	11	0.36	3
9 Sekerbank	2549	11	178	11	59	10	33.36	1	-0.07	5
10 TEB	2849	10	326	10	51	11	15.59	8	0.17	4
11 Tekstilbank	1169	12	117	12	6	13	5.38	12	-0.45	13
12 Vakifbank	17118	6	1173	6	232	5	19.78	4	-0.28	11
13 YapiKredi	20931	4	3521	3	162	7	4.61	13	-0.25	10
Average	12601		1789		268		16.38		0.01	

Table 10 summarizes the ranking results by performance measurement index. Garantibank and Akbank are the best performers for 2009 and 2010. Isbank shows a great deal of decrease in performance in the last two years although it is ranked as the 3rd performers in 2008. The performance of YapiKredi in 2010 shows a great increase compared to the previous years. Considering the past eight years under review, Garantibank has the most significant and consistent performance increase. Although Garantibank is ranked as 6th in 2006, 9th in 2004, 8th in 2005 and 9th in 2006, it presents a wonderful performance increase in the following years.

Table 10: Performance ranking of banks by performance index for the period of 2003-2010

	Banks	2010	2009	2008	2007	2006	2005	2004	2003
1	Garantibank	1	1	2	1	9	8	9	6
2	Akbank	2	2	3	3	5	4	1	1
3	YapiKredi	3	10	8	13	11	13	12	10
4	Halkbank	4	4	6	4	10	11	10	9
5	Isbank	5	5	1	5	4	1	2	3
6	Denizbank	6	6	5	11	6	6	8	7
7	TEB	7	3	4	2	2	2	7	4
8	Finansbank	8	8	7	10	1	7	5	8
9	Fortisbank	9	9	9	8	3	3	4	2
10	Vakifbank	10	7	11	9	7	5	3	11
11	Sekerbank	11	11	12	6	13	12	6	5
12	Alternatifbank	12	13	10	7	8	10	11	12
13	Tekstilbank	13	12	13	12	12	9	13	13

5 Concluding Remarks

This study measures the financial performance of commercial banks of Turkey in the period of 2003 and 2010 by employing a performance indexing approach. The findings rank 13 commercial Turkish banks for each year. On the other hand, nonfinancial factors have become more important in recent years measuring overall performance of any firm. Therefore, inclusion of nonfinancial factors such as higher customer satisfaction, effective management and leadership, using more advanced technology in banking operations etc. makes valuable contributions to the measurement of overall performance of banks rather than limiting the measurement by financials only.

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