Are Brand Value Reports Compatible with Financial Reports?

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Abstract

The purpose of this paper is to uncover whether brand value reports published by brand valuation organizations are compatible with the financial reports and whether brand value contributes to profitability and financial performance. For this purpose, four panel data model were built up to investigate the impact of brand value on profitability and performance, The data belongs to food companies which are among Turkey's top 100 listed brands. The data are collected from the brand valuation report and financial statements published between the years 2008-2018. Results of analysis indicate that there is no relationship between brand value and financial performance. However, the relations between brand value and profitability ratios are significant. This paper conclude that financial statements and brand valuation reports are not sufficiently compatible with each other. Additionally, this paper suggests that Turkish firms should try to increase their brand strengths.

Index terms— brand value, financial performance, brand equity, panel data. TOPSIS.

1 Introduction

lthough the origin of the brand dates back 1500s BC, it has reached its current meaning after industrial revolution (Perry & Wisnom, 2003). The reason why the brand has gained importance day by day is the assumption that strong brands create value added for companies **??**Kriegbaum, 1998;Kalicanin et al., 2015). That assumption has promoted many companies to increase their financial performances via brand. This trend has also led to a rise in the importance of brand value concept, which enables managers to compare their competitors.

Despite different findings, it is prevalent accepted that the brand value contributes positively to all activities of the company by providing status (O'Cast and Frost, 2002) and reducing the importance of price (Stanton and Furrel, 1987) as well as creating customer loyalty **??**Pride and Ferrel,1991). In a sense, brand value itself is a kind of performance measure.

Therefore, brand value attracts attention of not only company managers but also of many stakeholders such as investors and credit corporations. This interest has caused the establishment of various brand valuation companies that aim to guide users' decision-making. Including "Interbrand" valuation firm which was founded in 1974 as the first one, Millward Brown and Brand Finance companies are considered among the most important ones (Haig and ?lgüner, 2015). Today, majority of investors have been taking the reports published by brand valuation companies into account to invest.

However, each of these companies adopts different valuation methods and accordingly they may calculate brand value differently. Hence, one of the most important supporting resources for investors' decisionmaking is the financial statements of companies.

Although, brand valuation reports include the information in financial statements, they contain data based on subjective criteria and estimations. Yet financial statements indicate only the realized financial structure of the firms preceding year. However, in the long-run, the increase or decrease in the brand value is expected to reflect on financial performance and profitability. In other words, contribution of brand value to financial performance and profitability requires both to be compatible with each other. Otherwise, inconsistency between them needs questioning.

To date, considerable amount of research has dealt with testing the assumption that brand value contributes to financial performance. Most of these studies tend to measure the relationship between brand equity and financial performance (Barth et al., 1998; Abratt, R, & Bick, G., 2003; Kim, et al., 2005; Verbeeten & Vijn, 2010; Liu et al., 2017). On the other hand, there are also studies using the term brand value although they employ the brand equity measurement as in the study by ??eung and Ramasamy (2007).

However, particularly in Turkey, the amount of research using brand value published by consulting firms is still very limited. From this point of view, the purpose of this paper is to determine whether brand values published by brand valuation organizations are associated with the financial reporting system and whether brand value contribute to profitability and financial performance. Moreover, this paper, which provides an idea about the reliability level of the reports in relation to financial statements and brand value may provide invaluable insight to investors and brand valuation organizations. It also contributes to the relevant literature.

2 II. The Measurement Methods of Brand Equity and Brand Value

Brand equity (BE) briefly can define as the set of values created in consumers' minds because of comparing the brand name, symbols and connotations of the products offered by the company with competitor brands ??Tiwari, 2010). Research measuring brand equity uses non-monetary methods. Therefore, studies measuring brand equity aim to measure what consumers' attitudes towards brand dimensions and how they perceive them. For example, Aaker (1991Aaker (, 1996)) measures brand equity with dimensions such as brand awareness, brand connotation, perceived quality, and other brand assets (patents, trademarks, etc.).

Brand value (BV), on the other hand, is the embodied form of brand equity and expresses the monetary value of the brand. Tiwari (2010) defines brand value as the sale or replacement value of the brand. Research that measures brand value uses monetary methods. However, there are many monetary measurement methods such as cost based, -market value, licensing, price-premium ??Kriegbaum, 1998). Brand valuation companies use a mixed method that includes monetary and non-monetary approaches to calculate brand value. This paper, only explains Brand Finance's brand valuation method because it is data source.

3 III. Brand Valuation Method of Brand Finance

Brand Finance is an England based consulting firm and has been publishing the most valuable 100 brands in Turkey since 2008. We may summaries the method it used as follows:

Brand Finance defines the brand value as the part of the brand contribution that is able to transfer by means of sale or license. Using a mixed method, Brand Finance bases on the brand strength index for brand valuation. Brand strength consists of brand investments, brand capital and brand performance dimensions. These dimensions, which consist of tangible and intangible qualities, are evaluated over 100 points. Brand Finance uses it as brand strength score.

Later, Brand Finance applies the calculated brand strength score to the copyright payment range. The Royalty payment method bases on the assumption that a company does not own brand or licenses its brand from another company. Royalty payment interval differs from sector to sector within the frame of existing license agreements. For instance, in the case brand strength score is 75, in a sector where royalty payment interval is 1-5 percent, royalty payment ratio is 4 percent. Next, company applies revenues estimated the calculated royalty payment ratio to be obtained in the following years. In the last stage, it obtains net brand value by discounting proprietary revenue after tax (Haig & ?lgüner, 2015).

IV.

4 Measurement of Financial Performance

The researchers examining the relationship between the monetary value of the brand and financial performance adopt different financial measurement method. For example, Rasti and Gharibvand (2013) prefer book value and shareholder value as financial performance criteria. Yeung & Ramasamy (2008) as well as Arora & Chaudhary (2016) adopt performance criteria such as return on investment-ROI, return on asset -ROA, gross profit margin -GPM, net margin -NM and pretax margin -PM. In addition some researchers adopt performance criteria such as economic value added-EVA, return on sale-ROS and cash flow return on Investment-CFRI (Yükçü and Ata?an, 2010; Werbeeten and Win, 2010).

As a result, it is possible to say that a common consensus has not been reached, although it has been debated for years how to measure the financial performance of businesses. Knight (1998) classifies the methods used for measuring financial performance as income-based, cash-based, return-based and valuebased criterions. It is claimed that each of these methods has weaknesses as well as strengths (Young & O'Byrne, 2001;. Rogerson, 1997; ??ttosan & Weissenrieder, 1996).

Each new method proposed for financial performance measurement is the result of new requirements that emerge over time. The method chosen may vary depending on how the concept of performance is interpreted and whose benefit is a priority. For example, traditional methods focus on company profitability whereas value based methods focus on shareholder profitability.

As Buveneswari and Venkatesh (2013) point out, financial performance should be considered not only as a measure of how much revenue a company generates from operating activities, but also as a measure of how it uses its resources and how good its financial health is. In this framework, the present study considers both long-term financial health of companies and financial ratios that show their profitability. Aforementioned financial ratios are as follows (Table I).

5 Table I Financial ratios

6 Topsis Methodology

It is Hwang and Yoon those that proposed the TOPSIS method for the first time. (Cheng-RU et al. 2008).The standard TOPSIS method attempts to choose alternatives that simultaneously have the shortest distance from the positive ideal solution and the farthest distance from the negative ideal solution. The positive ideal solution maximizes the benefit criteria and minimizes the cost criteria, whereas the negative ideal solution maximizes the cost criteria and minimizes the benefit criteria. TOPSIS makes full use of attribute information, provides a cardinal ranking of alternatives and does not require attribute preferences to be independent. To apply this technique, attribute values must be numeric, monotonically increasing or decreasing, and have commensurable units (Wang & Elhag, 2006;Zavadskas et al., 2016). The TOPSIS method includes a six-step solution process (Kobry?, 2016).

7 Step1: Creation of a decision matrix

The lines of the decision matrix A indicate the decision points, and the columns indicate the evaluation factors used for decision-making. Matrix A is defined as the initial matrix and is illustrated as follows.

A=?? 11 ?? 12 ? ?? 1?? ?? 21 ?? 22?. ?? 2?? ?. ?? ?? ?.

??.

8 ??

9 ?? ??1 ?? ??2?. ?? ????

In the ?? ???? matrix, "m" represents the number of decision points and "n" represents the number of evaluation factors.

10 Step 2: Creation of a normalized decision matrix

The normalized " r" matrix obtained from matrix A is calculated using the following formula.?? ???? = ?? ???? ?? ?? ???? 2 ?? ??=1 i= 1,?.,m j=1,?.,n

Step 3: Creation of a weighted normalized decision matrix First, the weight of the evaluation factors is determined (?? ??). Then the elements in each column of the matrix"r" are multiplied by the value"?? ?? " and matrix V is generated.

11 Step 4: Indication of the positive and negative-ideal solution

In the V matrix, the maximum and minimum values of rows and columns are determined.?? + = {?? 1 + , ?? 2 + ? ? ? ? , ?? ?? + } maximum values in each column ?? ? = {?? 1 ? , ?? 2 ? ? ? ? ? , ?? ?? ? }

12 minimum values in each column

13 Step 5: Calculation of distance of each alternative to positive and negative ideal solution points

Maximum-minimum points and distances to ideal points are calculated by the following formulas.?? 1 + = ? ? (?? ???? ? ?? ?? =1 ?? ?? +) 2 i=1, 2..., m ?? 1 ? = ? ? (?? ???? ? ?? ?? =1 ?? ?? ?) 2 i=1, 2?, m

The numbers of ?? 1 + ???? ?? 1 ? to be calculated are the number of decision points.

Step 6: Calculation of the relative closeness of the decision points to the ideal solutionC i + = S i ? S i ? +S i + i=1, 2?, m

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14 (H)

Point ?? ?? + is inthe range of 0 ? ?? ?? + ?1 and indicates proximity to the ideal solution VI.

15 Methodology a) Sampling and data

The data belongs to food companies which are the among Turkey's top 100 listed brands. The data are obtained from the annual brand valuation reports and financial statements published between 2008 and 2018.The companies included in the research are selected based on three basic criteria.1) To operate in the same industry 2) to be within the brand valuation report during the research period 3) to reach the financial statements of the companies on Public Disclosure Platform (PDP). I reduced financial ratios including the period 2008-2018 into a single ratio by using TOPSIS method. The table below displays the brand values published by Brand Finance by years. (Table II). LBV is an independent variable in all models. LFP, LROS, LROA and LROE are dependent variables for each model. In models where ?? 0 symbolizes constant parameter, "?" is slope parameter; "U" is error term, "i" subscript indicates units (firms) and "t" subscript indicates time (i.e. years).I used software of the stata15 and e-views10 for the statistical analyses i.

16 Cross sectional dependency and unit root tests

Because of the fact that in panel data analyses non-stationary series lead to spurious regression the first step to be taken is to determine whether the series is stationary or not. The relevant literature suggests firstgeneration unit root tests, if not cross-sectional dependency, otherwise second-generation unit root tests. **??**Tato?lu, 2013b). According to Pesaran CD test, there is not cross sectional dependency except for LFP and LBV Therefore, I preferred second-generation unit root tests for the LFP, LBV and first generation unit root test for the others.

Second-generation unit root tests consisting of three groups aim to reduce the effect of correlation between units. Even though the first group of tests reduces the correlation between units, it may not be applicable in some cases. MADF (Multivariate Augmented Dickey Fuller), which is one of the second group tests requires T> N condition while SURADF (seemingly unrelated regressions augmented Dickey Fuller) is considered more suitable for time series rather than panel data **??**Tato?lu, 2018). The tests in the third group eliminate the correlation between the units by estimating the factor loads. I preferred the secondgeneration Pesaran CD unit root, which is preferred for non-stationary series and low number of units. The second and first generation test results of unit root are as follows (Table VI and VII). Stationarity refers to the resistance of a variable's series to the shocks it has been exposed to over the long term. Temporary shock effects imply the stationarity of the series while the permanence of shock effects indicates that the series has lost its stationarity. In other words, its parameters such as arithmetic mean and variance of the series do not change in the long term despite the shocks. The relationship between nonstationary variables may cause spurious regression. To overcome this problem of non-stationarity an econometric analysis of panel data has increasingly moved towards the cointegration model. Nevertheless, traditional Engle and Granger (1987) cointegration analysis cannot be applied if the stationarity level of the series is different (i.e., X series I (0) and Y series I (1).

In the first model, although independent variable is stationary, dependent variable (LFP) is not stationary. However, when the first differences method is conducted to LFP series, the series become stationary (Table VIII ARDL model could be expressed together with error correction models. Error correction models may be grouped into two main categories as first and second generation. Dynamic fixed effects (dfe), pooled mean group estimator (pmg), mean group estimators (mg), and random coefficient model (rcm). General characteristic of first generation estimators is that they do not consider inter-unit correlation. Conversely, second-generation estimators such as common correlated effects (cce), augmented mean group (amg) and dynamic common correlated effects (dcce) consider inter-unit correlation. Additionally, though some of first generation estimators take homogeneity and some heterogeneity into consideration all of secondgeneration estimators consider heterogeneity **??**Tato?lu, 2018; **??**72; **??**73). Therefore, determining the most suitable estimation model requires conducting homogeneity and cross section dependency tests. Swammy test results point out that the model established with LFP and LVB variables is heterogeneous {Chi (2)10=141.02; p=0.000). LM test shows that the remains in model with aforementioned variables include inter-unit correlation (LM-71.32; p=0.000). These results point out that the best estimators for the model-1 are second-generation error correction models.

Augmented mean group estimator (AMG), one of the second-generation error correction models is estimated with first difference method by adding T-1 number time dummy variable in the first stage. In the second stage, the estimations made in the previous stage are added to error correction model established for each unit. In the third stage, the AMG estimator adapts the ARDL model proposed by Pesaran and Smith to the MG model. In the third stage, the AMG estimator uses the following estimator by adapting the ARDL model proposed by Pesaran and Smith to the MG model **??**Tato?lu, 2018: 279-303). So model-1 can be written as follows. Table VIII:

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??????? ???? =? ?? (?????? ???? ?1 -? ?? ? ?????? ???? ?1)+? ?? =1 ???1 ? ?? * ??????? ???? ??? +? ?? =1 ???1 ? ?? * ??????? ???? ??? +?? ???? +? ???? ? = (1 ? ? ?? =1 ?? ? ??), ?=? ?? =1 ?? ?? ?? /(1 ? ? ??); ? ?? * = ?? ?? =?? +1 ?? ? ?? ; ? ?? * = ?? ?? =?? +1 ?? ? ??

Here "?" represents long period," ?" and "?" are represent short period and "?" is error correction parameter.

18 b. Stationary panel data models and model selection

Literature suggests either fixed effects or random effects model in the stationary panel data models, if there is unit or time effect. Otherwise, it suggests classic model. Literature suggests that random effects model should be preferred for estimations conducted for a large mass. Panels with no unit and time effect are defined as homogeneous and others as heterogeneous panels **??**Tato?lu, 2013a).

I conducted F" test for unit effect and LR (like hood ratio) test for time effect. I also performed Hausman test to choose between fixed effect and random effects. The table below shows test results. (Table IX). Since the unit effect is not constant in random models, it is shown in the margin of error, not in the fixed parameter (Vit= ? ?? + ?? ????). Here the term ?? 0 represents constant, other ? the slope and ?? ???? represent all residual errors.

19 VII.

20 Assumption Tests

Consistent estimates depend on whether selected models meet assumptions. General assumptions about our preferred panel data models are summarized below.

21 a) Distribution of error terms

The null hypothesis states that Uit means are equal to zero. Results of Jarqua Bera tests are as follows (Table X).

22 b) Heteroscedasticity

In panel data models, it is expected from error term to be homoscedastic within unit and inter-units. We employed Breush Pagan Lagrange Multiplier test to examine heteroscedasticity in random effects model and altered Wald test for fixed effect model. Test results Autocorrelation means that there is a significant relationship between the unit values of successive error terms. Annual or seasonal period difference between error terms shows the degree of autocorrelation. In case where there is a significant relation between t period errors and t-1 period in an annual time series, there is first order autocorrelation. We performed LM test for random effect model and DW test for fixed effect model to understand whether there is an autocorrelation. Test results indicate the presence of autocorrelation for all models exclusive of forth model (Table XII). One of the general assumptions of panel data models is that error terms are not correlated according to the units. Literature suggests Pesaran CD test to investigate cross section dependency for both random and fixed effect models in cases of T?N . Test results are as follows (

23 e) Robust estimator for deviation from the assumption

In cases where there is at least one of the heteroscedasticity, autocorrelation or correlation between the units, literature suggests correction of standard errors or using robust estimators without changing parameter . Robust estimators conduct the corrections needed when the panel data models do not meet the assumptions.

24 VIII.

25 Findings a) Effects of brand value on financial performance

Estimation results of AMG, which is one of the second-generation error correction models and developed to correct heteroscedasticity and correlation between units as is below (Table XIV). Wald test indicates that model is significant (Chi2 (4) =36.97; p=0.000). Error correction parameter of the model is negative and significant (-1.019). However, it seems that there is no significant relationship between financial performance and brand value in both the short and the long period

26 b) Effects of brand value on profitability rates

Second, third and fourth models aim to examine the effect of LBV on LROS, LROA and LROE. Although third and fourth models do not include cross section dependency (correlation between units), they have heteroscedasticity and autocorrelation. The test results of all three models indicate that the relationship between dependent and independent variables are significant.

27 IX.

28 Discussion

Although there are many studies examining the relationships between brand value and financial performance, most of them approach the issue from the different point of views. If we ignore research that measures the relationship between brand equity and financial performance, we can say that the main source of discrepancy at issue is related to the measuring of financial performance. This distinctness makes it difficult to compare directly the results of researches regarding the financial performance. For instance, Yeung and Ramasamy accept market returns and stock market as external financial performance measure (2008) while they accept ROA, ROE and ROI as an internal performance measure. Another example is article of **??**asti and Gharibvan (2013). The authors adopt EBIT (Earnings before interest and tax) and dividend yield as financial performance measure. The results of the aforementioned researches indicate that the brand value relation with the EBIT and stock market, but not to the dividend income and market return.

Contrary to the research results pointing out the relationship between brand value and financial performance, the results indicating the relationship between brand value and profitability rates are directly comparable. On the other hand, some of the directly comparable studies support our research results while others do not. For example, the research results of Ceylan (2019) as well as Yeung and Ramasamy (2008) support our research while Chaudhary's (2016) research results do not.

The results of the research conducted by Yeung and Ramasamy (2008) indicate that the brand value had a positive effect on the internal performance criteria such as ROI, ROA, GPS and PM. Ceylan (2019) concludes that the brand value had positive effects on the profitability of the assets. However, she calculates the brand value using the Hirose model. Results of the study in banking sector by Arora and Chaudhary (2016) indicate that brand value relation to ROA and ROE however, this relationship is negative. The researchers interpret this result as the fact that the expenses made to increase brand value have reduced the return. However, results of this study point out that brand value positively affects profitability rates (ROS-ROA and ROE).

Normally, brand value is expected to make a positive contribution to financial performance and profitability in every condition, as they greatly reduce price flexibility and isolate the competition strategies of competitors. Whereas the results of our research indicate that "brand-value" does not affect financial performance but it affects profitability rates positively. This result may result from the financial rates, which we use to calculate financial performance. When we consider that some of the rates used for financial performance are affected not only by brand strengths but also by management skills, it is possible to say that the result is reasonable. Contrary to financial performance, it is more likely that strong brands affect profitability rates because of generating more profitability of high price.

The profitability rate that the brand value contributes the most is ROE. One percent increase in brand value contributes to the ROE at the level of 0.41 percent. These rates are 0.22 percent for ROA and 0.18 percent for ROS. Although strong brands are expected to contribute most to the profitability of sales, it is quite interesting that they contribute to the lowest level.

Even if the positive effect of the increase in brand value on the sales is statistically significant, it may be interpreted that the contribution level is extremely low. The reason for this is the compulsory expenditures that companies make to protect the brand strength besides creating a brand. Such a result is not compatible with the importance attributed to the brand.

29 X.

30 Conclusion

What conclusion should we draw from this study? In my opinion, I can say this study points out two possible problems. The first possible problem is that Turkish companies do not have a strong brand. For this reason, it is possible to say that Turkish firms need to put much more effort to increase their brand values, which may also enhance their competitive strength.

The second possible problem is possibility of investor losing trust in the brand valuation reports and financial statements. The reason is that brand valuation reports and financial statements are not compatible with each other. Where as it is expected that the reports at issue associate with each other's especially in the long term. Otherwise, investors may distrust about the financial statements and brand valuation reports. I can say that the problem is in the financial statements probably, when we consider that the brand valuation companies use the information in the financial statements.

In fact, it is known that accounting manipulations in corporate "financial reports" are performed in all countries and in every age. In other words, many companies manipulate their financial reports to some extent to achieve their "budget" goals and in order to show that managers are successful. Additionally, many companies manipulate to some reasons such as greed, desperation, immorality or tax evasion. (Bhasin, 2016). Generally, such manipulative behaviors are prevented by accounting standards. When evaluated in this context; the results also may be interpreted as a sign that accounting standards should still be developed XI.

31 Limitations and Future Research

The findings and insight gained from this research are valid and significant. However, some limitations cannot be overlooked. First, the sample size involved in this research is small because the number of companies meeting the selection criteria as explained in the sampling method is limited. Second, the time dimension is not sufficient for some of the error correction models. Third, the numerator and denominator, which show debt ratio and leverage ratio were inverted to ensure that the rates used to calculate financial performance are in the same direction (e.g., "Assets/Debts" instead of "Debts/Assets"). Finally, even if the data is subjected to logarithmic transformation, LFP and LROS are not normally distributed. Therefore, the results cannot be generalized. Future research may assess these models for the companies other than food industry in order to explore generalizability of the findings. [1] [2]

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[2]

I

Solvency	CR	Current Ratio
	AR	Acid Ratio
Turnover	STR	Stock Turnover Ratio
	AT	Asset Turnover)
	FAT	Fixed Asset Turnover
Financial structure	LR	Leverage Ratio
	DR	Dept Ratio
Profitability	ROE	Return on Equity
	ROA	Return on Asset
	ROS	Return on Sale

As in other similar studies measuring financial performance by using multiple financial ratios, the present study also employs the TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method (Inani and Gupta, 2017; Zavadskas, et al.. ;2016; Fenk and Wang, 2000; Yükçü and Ata?an, 2010; Yu-Jie, W. 2008).
V.

Figure 1: Table I :

II

YILLLAR/FIRMA	MIGROS	BIM	TAT	Kent	BANVIT	ULKER
2008	735	582	75	64	75	193
2009	1213	688	102	76	101	331
2010	1234	923	131	99	172	364
2011	812	1182	92	68	118	385
2012	653	965	64	103	136	452
2013	680	1395	77	111	141	657
2014	610	1120	60	106	125	564
2015	547	1387	69	107	131	745
2016	512	668	82	111	88	522
2017	531	742	104	55	52	647
2018	638	584	78	66	89	616
2019	235	308	38	41	37	401

I formed a total of 11-decision matrix belonging to six firms among 2008-2018, by using the profitability ratios (a decision matrix per year). Due to space concerns, only the matrix displaying the year 2008 included (Table III).

Figure 2: Table II :

III

2013	1.756	3.465	3.555	5.646	2.726	3.467
2014	1.914	3.595	4.606	5.714	2.816	3.733
2015	1.787	4.823	7.555	8.453	3.847	4.972
2016	1.335	4.254	7.27	5.93	3.892	4.018
2017	1.724	3.406	4.86	5.134	3.583	3.037
2018	1.808	2.669	1.473	1.905	2.043	1.899
2019	1.940	2.665	1.469	1.702	2.085	1.887

b) Developing econometric model

2008	CR	STR	AR	AT	FAT	ROS ROE	ROA	DR	L
Migros	1.354	6.946	0.948	0.593	3.045	0.0950.076	0.056	1.284	1
Bim	0.761	20.151	0.346	5.057	10.496	0.0350.564	0.179	0.465	1
Tat	0.973	5.206	0.582	1.195	4.033	0.0200.078	0.024	0.431	1
Kent	0.797	7.228	0.575	0.991	2.844	0.0520.160	0.051	0.469	1
Banvit	1.354	11.038	1.011	1.591	5.085	0.0050.035	0.007	0.266	1
Ülker	1.245	2.399	1.089	0.151	1.077	0.3670.149	0.055	0.590	1

Table IV indicates the financial performance scores calculated for 11 years using the TOPSIS method

Table IV: Financial performance scores

	MIGROS	BIM	TAT	KENT	BANVIT	ULKER
2008	2.714	5.062	4.965	5.077	4.496	5.422
2009	1.874	3.878	3.956	5.798	3.546	4.318
2010	1.92	3.873	4.159	5.355	3.895	4.947
2011	2.092	4.757	4.974	6.573	4.069	5.127
2012	2.047	4.457	4.663	7.548	3.717	4.391

Figure 3: Table III :

V

Data set	Pesaran CD test	p
LFP	8.4511	0.0000
LBV	5.7085	0.0000
LROS	-1.6223	0.1047
LROA	-1.1075	0.2681
LROE	-1.4374	0.1506
$p<0.05$		

Figure 4: Table V :

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	t-bar	cv10	cv5	cv1	Z[t] bar	p	
LFP	-1.381	-2.220	-2.370	-2.260	0.790	0.770*	non-stationary series
LBV	-1.843	-2.220	-2.370	-2.260	-0.299	0.383*	non -stationary series
P>0.05							

[Note: T]

Figure 5: Table VI :

VII

	LROS statisitic	p	LROA statisitic	p	LROE statisitic	p
Levin Li Chu (t)	-5.652	0.0000*	-9.9634	0.0000*	-10.352	0.0000*
Im pesaran Shin (W)	-3.606	0.0002*	-7.4259	0.0000*	-7.781	0.0000*
ADF -Fisher (chi squre)	34.138	0.0006 *	63.998	0.0000*	63.998	0.0000*
PP Fisher (chi square)	34.001	0.0007*	70.034	0.0000*	73.829	0.0000*

P<0.05;
ii. Panel data model selection
a. Panel data model selection in non-stationary series

Figure 6: Table VII :

Unit root test for LFP series (First gen

Series: D(LFP) Method	Statistic	Prob.**	sections
Null: Unitroot (assumescommonunitrootprocess)			
Levin, Lin &Chu t*	-2.36571	0.0090	

Pesaran Smith and Shin suggest (2001) Auto Regressive Distributed Lag model (ARDL) which is a special type of cointegration test for cases when stationarity level of series are different I(0) and I(1). While cointegration tests estimate long-term relationships between the variables, error correction models (ECM) estimate both long term and short-term relationships.

Figure 7:

IX

Models	Test ad?	Null Hypotesis	Test ?statisti?i	p
Model -2	F	?? 0 : ??? = 0	F (5,59)=14.28	0.0000*
	LR	?? 0 : ?? ?? = 0	Chi2 (01)=0.00	1.000
	Hausman	?? 0 : ??? = r	Chi2 (1)=1.50	2.201(re)
Model -3	F	?? 0 : ??? = 0	F (5,59)=4.480	0.0009*
	LR	?? 0 : ?? ?? = 0	Chi2 (01)=2.8e-14	1.0000
	Hausman	?? 0 : ??? = r	Chi2 (1)=2.98	0.0840 (re)
Model -4	F	?? 0 : ??? = 0	F (5,59)=11.98	0.0000*
	LR	?? 0 : ?? ?? = 0	Chi2 (01)=0.000	1.0000
	Hausman	?? 0 : ??? = r	Chi2 (1)=8.35	0.0039(fe)
	Model - 2:			

[Note: (One way random effects model) Model -3: ?????? ???? = ?? 0?? + ?? ?? ???? ???? + ?? ???? (One way random effects model) Model -4: ?????? ???? = ?? 0?? + ?????? ???? + ?? ???? (One way fixed effects model)]

Figure 8: Table IX :

X

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Modeller	Jarkue Bera	P
?? ???? = 0; (Model 2)	0.891	0.9230*
?? ???? = 0 (Model 3)	0.746	0.0580*
?? ???? = 0 (Model 4)	3.098	0.0143**

P> 0,05; **p>0.01

Figure 9: Table X :

XI

Model	Null Hyp	Test Statistic	p
Model 2 (re)	Var(u)=0	Breush Pagan LM, Chibar2 = 71,84	0.0000
Model 3 (re)	Var(u)=0	Breush Pagan LM,. Chibar2(01)=9.61	0.0010
Model 4 (fe)	?? ?? 2 = ?? 2	Wald testi, Chi2 (6)= 978.04	0.0000

p<0,05

c) Autocorrelation

Figure 10: Table XI :

XII

Model	Test ?statisiti?i		p
Model 2 (re)	LM (lambda=0)	= 24.97 Pr>chi2 (1)	0.0000*
	ALM (lambda=0)	= 2.34 Pr>chi2 (1)	0.1262
	Joint (var(u)=0, lambda=0) =74.18 Pr>chi2 (2)		0.0000*
Model 3 (re)	LM (lambda=0)	= 7.20 Pr>chi2 (1)	0.0425*
	ALM (lambda=0)	=2.27 Pr>chi2 (1)	0.1323
	Joint (var(u)=0, lambda=0) =11.88 Pr>chi2 (2)		0.0000*
Model 4 (fe)	Modified Bhargava et al. DW=1.89		n= 66 için db=1.37
	(?f db<DW<4-db	No aotocorela-tion)	1.37<1.89<2.63
	Baltagi Wu LBI= 2.09		

P<0.05

d) Cross section dependency (Correlation among units)

Figure 11: Table XII :

XIIXIII

Model 2	Model 3	Model 4
Pesaran= -1.402	Pesaran = -1.329	Pesaran: -0.748
P=1.839	P= 1,816	P= 1,816

Figure 12: Table XII Table XIII :

XIV

xtmg dLFP dLBV dlLFP lLFP lLBV, aug

dLFP	Coef	Std Err	z	p>Z	[95% Conf. Interval]	
dLBV	.0578541	.0780104	0.74	0.458	.0950435	.2107518
dlLFP	.5636441	.1037567	5.43	0.000	.3602847	.7670036
lLFP	-1.018913	.2006249	-5.08	0.000	1.412131	-.6256959
lLBV	-.0434217	.1250677	-0.35	0.728	-.28855	.2117066
00000Rc	1.024834	.2012054	5.09	0.000	.6304785	1.419189
cons	.8251058	.8490087	0.97	0.331	.8389207	2.489132
Wald chi2(4)	= 36.97	Prob > chi2	= 0.0000			

Variable 00000Rc refers to the common dynamic process.

Figure 13: Table XIV :

XV

xtgls LROS LBV, i(id) t(t) panels (correlated)

LROS	Coef.	Std. Err.	z	P>z	[95% ConfInterval]	
LBV	.1891839	.0310992	6.08	0.000	.1282306	.2501371
_cons	-4.005708	.1962197	-20.41	0.000	-4.390292	-3.621125
Wald chi2(1)	= 37.01	Prob> chi2	= 0.0000			

Table XVI: Relation between BV and ROA (Model 3)

xtgls LROA LBV, i(id) t(t) panels (correlated)

LROA	Coef.	Std. Err.	z	P>z	95% ConfInterval]	
LBV	.2209399	.0517723	4.27	0.000	.119468	.3224118
_cons	-4.003274	.3248985	-12.32	0.000	-4.640063	-3.366485
Wald chi2(1)	= 18.21	Prob> chi2	=	0.0000		

Table XVII: Relation between LBV and LROE (Model 4)

xtgls LROE LBV, i(id) panels(hetero)

LROE	Coef.	Std. Err.	z	P>z	95% ConfInterval]	
LBV	.4122762	.0687638	6.00	0.000	.2775016	.5470508
_cons	-3.891073	.3830425	-10.16	0.000	-4.641823	-3.140323
Wald chi2(1)	= 35.95	Prob> chi2	= 0.0000			

Figure 14: Table XV :

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