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FINANCIAL PERFORMANCE EVALUATION OF TURKISH NON-METALLIC MINERAL PRODUCTS COMPANIES LISTED AT BORSA ISTANBUL BY USING EVA

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Abstract

Economic value added (EVA) has become a significant criterion for companies to evaluate their financial performance since it is reliable, shows persistence, and is able to measure firm value precisely. EVA, in addition to seven additional traditional performance measures have been employed on 26 Turkish Non-Metallic Mineral Products Industrial companies listed at Borsa Istanbul, over a period 2004-2013. The high and low performing companies have been found by combining with the annual reports of sample firms published during 10 years period. In addition, the sample firms have been ranked on the basis of EVA. Furthermore, regression analyses have been applied to examine the relationships between EVA and each traditional measurement used in the study. Findings of the study revealed that EVA and EPS are not interrelated for Turkish Non-Metallic Mineral Products Industrial companies of Borsa Istanbul during the period 2004-2013. On the other hand, it is apparent that EVA has a positive association with ROA, basic earning power, and gross profit margin. The results of the study will be fruitful.

Keywords: Economic Value Added, Financial Performance Evaluation, Firm Value, Earnings per share, Return on Equity



INTRODUCTION

Financial performance is the primary objective of a corporation; thus, it acts as the most significant binding result of the firm's operating activities. Selecting the appropriate measurement tool is an important factor to assess performance and evaluate a company's or a division's ability to accomplish a profitability target. New York-based consulting company Stern Stewart & Company has developed economic value added (EVA) as a method of valuation. The method has become popular recently but in fact it has been evolving for over 100 years (Wheelen and Hunger, 2012).

EVA is a value calculated by extracting invested capital that is used to acquire the profit from the company's net operating profit after tax. Additionally, it is one of the most widely accepted value based performance measures in terms of evaluating company value, creating a different culture by constituting the concept of value creation in a business and managing companies effectively. Therefore, the basic logic of EVA is measuring the value precisely and maximizing it for business owners. This approach takes into account the cost of external and internal sources allocated and thus, EVA considers expenses, such as R&D and education expenditures, that will contribute the future value of companies as a value created rather than an expense (Garrison et al., 2011).

The purposes of the study are to investigate EVA within Turkish Non-Metallic Mineral Products Industrial companies listed at Borsa Istanbul between 2004 and 2013 and to identify whether firms have created value according to EVA as well as which firms have created positive or negative EVA within the sector during the same period. It has also targeted to analyze the associations between EVA and internal performance variables, including earnings per share (EPS), return on assets (ROA), basic earning power, return on equity (ROE), gross profit margin, operating profit margin, and finally net profit margin. Within the scope of these aims, the paper addresses the following research questions:

- 1. Which firms have created value in terms of EVA for shareholders over the period 2004-2013?
- 2. Which companies have created positive or negative value of EVA regarding the period of 2004-2013?
- Which internal performance variables, in other words value drivers, have a stronger or a lower relationship with EVA, for the period between 2004 and 2013?

Under the scope of these empirical questions, a descriptive study is conducted. Secondary data are employed. Findings of the study are discussed by comparing the outcomes of data analysis of the study.



LITERATURE REVIEW

Historical Background of EVA

In the current states of the markets, determining firm value appropriately is significant for decision makers because firms' tendency for going public as well as mergers and acquisitions have increased. For this reason, the ways of accurately detecting company value have been investigated. In addition to this, maximizing this value up to highest levels is important for managers. Several approaches have been evolved with the purposes of determining and managing firm value. One of the most important of these methods is EVA (Chatterjee, 1986; Çam, 2006).

Although EVA has been a new method in terms of the financial point, the basis of this method is the concept of RI, it is observed that EVA has been a performance evaluation approach since its origin dating back to the 1890s (Baginski and Wahlen, 2003). In the 1890s, the groundwork of EVA was coming together, which was mainly based on RI. The idea of RI has been expressed by Alfred Marshall for the first time. Marshall defined economic profit as the excess part of invested capital over the interest rate. In other words, it was described as the difference between profit and total cost of capital (Marshall, 1890). Performance evaluation methods, based on the concept of RI, have been used by General Motors since 1920 and by General Electric since 1955 (Bromwich and Walker, 1998).

In the 1980s, the concept of EVA was developed by G. Bennett Stewart and Joel Stern Stewart & Company Advisory Group. Traditional performance measures, such as net profit after tax, net income, EPS, ROA, ROE, and so on, are based on the measurement of a corporation's profitability and accounting profit. In contrast, EVA is a measure based on the figure of residual return of firm as well as economic profit. Hence, the costs of both debt and equity are taken into consideration by EVA (Goldberg, 1999; Grant, 2003).

Today, EVA is used by many corporations. Companies, constituted the milestones of American economy, such as Coca-Cola, AT&T, Eli Lilly, Quaker Oats, United States Postal Service and Briggs & Stratton, are assessing their performance with EVA method (Zimmerman, 2000). Among all, Coca-Cola Company is known to be the early users of EVA. In 1981, its stock price was \$3. As a result of the implementation of this method, at the end of 2001, its stock price increased up to \$60 (Ray, 2001).

The business world of Turkey was introduced with the concept of EVA in 1995. In Turkey, EVA was first used by Kordsa A.Ş. that has been operating under Sabanci Holding. Later, Söktaş A.Ş., Oyak Renault A.Ş., Fiat-Tofaş A.Ş. and ArzumMutfakGereçleri A.Ş. have employed EVA (Gezer, 2007). Though these companies are the pioneers in adopting EVA, such



method has not been recognized by other companies in Turkey and consequently, it has not found much ground for use among Turkish companies (YIImaz and Basti, 2013).

Calculation of EVA

EVA is the difference between operating profit and cost of capital as monetary value. With this approach, the added value created by a company is measured depending on net operating profit after tax (NOPAT), investments of asset that is needed to obtain this profit and cost of investment that is made to these assets specifically weighted average cost of capital (WACC) (Brewer et al., 1999). EVA can be calculated in different ways:

EVA = NOPAT- (Cost of capital x Invested capital) as per Peterson and Peterson, 1996 EVA = (Return on invested capital – WACC) x Invested capital as per Damodaran, 2011 The main theory of EVA is that when operating profit is compared with the cost of total invested capital, EVA measures this comparison as whether it is sufficient or not. The idea behind EVA is getting the return on the incurred risks taken by shareholders (Stern et al., 2001; Grant, 2003). If EVA is zero, shareholders would achieve returns that cover the risks they undertake and such condition would be considered as sufficient. If EVA is positive, this would indicate that the corporation has acquired operating profit after tax more than the cost of assets invested to achieve profit, which would mean that business has created the added value. Nevertheless, if the result is negative, this means that firm consumes capital rather than creating value and it uses the added value created in earlier periods. After all, the company's financial objective is to have a positive and constantly rising EVA (Chakrabarti, 2000).

METHODOLOGY

This study provides empirical evidence on which companies have created value on the basis of EVA, which corporations have created positive or negative EVA, and finally, whether there exists a relationship between EVA values and traditional accounting measures which are EPS, ROA, basic earning power, ROE, gross profit margin, operating profit margin, and net profit margin, in the context of Turkish Non-Metallic Mineral Products Industrial firms at Borsa Istanbul. The research covers a period of 10 years from 2004 to 2013. Therefore, EVA and value drivers for those Turkish industrial firms are figured out for the same time period.

Sample

Sample consisted of 26 firms that are selected from listed companies at Borsa Istanbul. Initially 29 companies are listed at Turkish Non-Metallic Mineral Products Industry of Borsa Istanbul as the population. In order to calculate a firm's EVA for 10 years, it is required to have financial



information for 11 years because invested capital is used in the calculation. The minimum 11 years of historical data (2003-12 to 2013-12) is as a constraint for the study, thus, this criterion eliminated some of companies from the original population, which is all of the Turkish Non-Metallic Mineral Products Industry listed at Borsa Istanbul. The full list of these companies for the study is as the following:

INDEX CODE	STOCK CODE	COMPANY NAME
	ADANA	Adana ÇimentoSanayiiTürk A.Ş. (T.A.Ş.)
	AFYON	AfyonÇimentoSanayi T.A.Ş.
	AKCNS	AkçansaÇimentoSanayiveTicaret A.Ş.
	ANACM	Anadolu Cam Sanayii A.Ş.
	ASLAN	AslanÇimento A.Ş.
	BTCIM	BatıçimBatıAnadoluÇimentoSanayii A.Ş.
	BSOKE	BatısökeSökeÇimentoSanayii T.A.Ş.
	BOLUC	BoluÇimentoSanayii A.Ş.
	BUCIM	Bursa ÇimentoFabrikası A.Ş.
	CMBTN	ÇimbetonHazırbetonvePrefabrikYapıElemanlarıSanayiveTicaret A.Ş.
	CMENT	Çimentaş İzmir ÇimentoFabrikasıTürk A.Ş. (T.A.Ş.)
	CIMSA	ÇimsaÇimentoSanayiveTicaret A.Ş.
YTAST	DENCM	Denizli Cam SanayiiveTicaret A.Ş.
ATAST	DOGUB	DoğusanBoruSanayiiveTicaret A.Ş.
	ECYAP	EczacıbaşıYapıGereçleriSanayiveTicaret A.Ş.
	EGSER	EgeSeramikSanayiveTicaret A.Ş.
	GOLTS	GöltaşGöllerBölgesiÇimentoSanayiveTicaret A.Ş.
	HZNDR	HaznedarRefrakterSanayii A.Ş.
	IZOCM	İzocamTicaretveSanayi A.Ş.
	KONYA	Konya ÇimentoSanayii A.Ş.
	KUTPO	KütahyaPorselenSanayii A.Ş.
	MRDIN	MardinÇimentoSanayiiveTicaret A.Ş.
	NUHCM	NuhÇimentoSanayi A.Ş.
	TRKCM	Trakya Cam Sanayii A.Ş.
	USAK	UşakSeramikSanayii A.Ş.
	UNYEC	ÜnyeÇimentoSanayiveTicaret A.Ş.

Table I The list of the sample companies of the study

The Data

Secondary data is employed in this study. Official web sites of Borsa Istanbul (www.borsaistanbul.com) and Public Disclosure Platform (www.kap.gov.tr) are used to gather the information regarding required financial data for the period that the study covers. The data used in the research include financial statements and disclosures for 26 publicly traded at Borsa



Istanbul firms of Turkish Non-Metallic Mineral Products Industry, covering a period of 10 years, from 2004 to 2013. Based on this data, 260 annual observations are obtained for each variable such as EVA, EPS, ROA, basic earning power, ROE, gross profit margin, operating profit margin, and net profit margin.

Analytical Approach

These secondary data are transferred to Microsoft Excel program; necessary formulas are used in order to calculate variables. In this study, it is to be determined whether independent variables that are EPS, ROA, basic earning power, ROE, gross profit margin, operating profit margin, and net profit margin, explain EVA or not. Therefore, in order to perform all analyses, SPSS 20.0 for Windows is used in this research.

Measurement Instruments

Variables and measures, including EVA, EPS, ROA, basic earning power, ROE, gross profit margin, operating profit margin, and net profit margin are identified. Calculations of WACC and cost of equity are required in order to determine EVA. There are several possible approaches in the literature in order to compute cost of equity. One of the calculation approaches utilizes CAPM. However, CAPM has been challenged by many empirical studies and its validity has been guestioned. Furthermore, since its validity for Turkish Stock Market is guestionable, the traditional cost of equity calculation, capital gain plus dividend gain, has been chosen for the aims of this study (Erce, 2008). Thus, EVA is calculated as the following:

EVA = NOPAT – (WACC * Invested capital previous year)

NOPAT = Operating profit – (Operating profit * Tax rate)

Invested capital_{previous year} = WC previous year + LTA previous year

WC previous year = CA previous year - CL previous year

 $WACC = (W_e * R_e) + (W_d * R_d * (1 - t))$

W_e = Shareholders' equity / Total capital

W_d = Book value of debt / Total capital

Total capital = Book value of debt + Shareholders' equity

Book value of debt = CL + LTD

R_d = Interest expense / Book value of debt

R_e = (Ending value – Beginning value + Dividend) / Beginning value



EVA that is assumed to represent the overall performance of firms is utilized as a dependent variable of the study. In addition to this, EVA/Sales, EVA/Total assets, and EVA/Total equity are used as dependent variables in the research.

Moreover, the study has 7 independent variables that are assumed to determine the financial performance. These variables are EPS, ROA, basic earning power, ROE, gross profit margin, operating profit margin, and net profit margin. The computations of these variables are depicted in Table 2.

	· · ·	•	
Dependent variables	Measured as	Independent variables	Measured as
EVA/Total assets	<u>EVA</u> Total assets	Earnings per share	<u>Net income</u> Number of shares outstanding
EVA/Total equity	<u>EVA</u> Total equity	Return on assets	<u>Net income</u> Total assets
EVA/Sales	<u>EVA</u> Sales	Basic earning power	Operating income Total assets
		Return on equity	<u>Net income</u> Shareholders' equity
		Gross profit margin	<u>Gross income</u> Sales
		Operating profit margin	Operating income Sales
		Net profit margin	<u>Net income</u> Sales

Table 2 Computation of dependent and independent variables

Under the scope of the final empirical question addressed is whether EVA has an association with EPS, ROA, basic earning power, ROE, gross profit margin, operating profit margin, and net profit margin. For this reason, the following hypotheses are tested:

- **H**₁: There is an association between EVA and EPS.
- **H**₂: There is an association between EVA/Total assets and ROA.
- H_3 : There is an association between EVA/Total assets and basic earning power.
- H_4 : There is an association between EVA/Total equity and ROE.
- H_5 : There is an association between EVA/Sales and gross profit margin.
- H_6 : There is an association between EVA/Sales and operating profit margin.
- H₇: There is an association between EVA/Sales and net profit margin.



RESULTS and DISCUSSION

Discussion on EVA based ranking

In Table 3, total and average values of EVA and their rankings based on EVA of the whole sample companies are exhibited during the entire study period. While average EVA is taken as the base, it is found that CimsaCimentoSanaviveTicaret A.S. (79,429,268 TL). AkçansaÇimentoSanayiveTicaret A.Ş. (38,826,663 TL), and ÜnyeÇimentoSanayiveTicaret A.Ş. (35,030,188 TL) are the first three wealth creating firms in the sample. However, the final three wealth destroying firms are AslanÇimento A.Ş. (-172,106,059 TL), AfyonÇimentoSanayi T.A.Ş. (-109,510,970 TL), and Trakya Cam Sanayii A.Ş. (-96,856,060 TL).

Additionally, it can be seen from Table 3 that 10 out of 26 firms from Turkish Non-Metallic Mineral Products Industry of Borsa Istanbul are the most valuable companies because an overall positive EVA was recorded by them during the entire study. These companies are ÇimsaÇimentoSanayiveTicaret A.Ş., AkçansaÇimentoSanayiveTicaret A.Ş., ÜnyeÇimentoSanayiveTicaret A.Ş., Konya ÇimentoSanayii A.Ş., İzocamTicaretveSanayi A.Ş., MardinCimentoSanayiiveTicaret A.Ş., BatıçimBatıAnadoluÇimentoSanayii A.Ş., BoluCimentoSanavii A.S., GöltaşGöllerBölgesiÇimentoSanayiveTicaret and A.Ş., NuhÇimentoSanayi A.Ş.

Stock code	Total (TL)	Average (TL)	Rank	Stock code	Total (TL)	Average (TL)	Rank
ADANA	-462,951,608	-46,295,161	20	DOGUB	-14,461,564	-1,446,156	14
AFYON	-1,095,109,704	-109,510,970	25	ECYAP	-205,730,460	-20,573,046	18
AKCNS	388,266,634	38,826,663	2	EGSER	-11,443,982	-1,144,398	12
ANACM	-531,999,498	-53,199,950	21	GOLTS	120,761,965	12,076,197	9
ASLAN	-1,721,060,585	-172,106,059	26	HZNDR	-12,675,372	-1,267,537	13
BOLUC	121,829,714	12,182,971	8	IZOCM	280,785,140	28,078,514	5
BSOKE	-366,723,174	-36,672,317	19	KONYA	285,969,325	28,596,933	4
BTCIM	149,093,844	14,909,384	7	KUTPO	-561,076,138	-56,107,614	22
BUCIM	-92,715,993	-9,271,599	17	MRDIN	201,813,468	20,181,347	6
CIMSA	794,292,682	79,429,268	1	NUHCM	8,803,698	880,370	10
CMBTN	-346,996	-34,700	11	TRKCM	-968,560,600	-96,856,060	24
CMENT	-886,109,060	-88,610,906	23	UNYEC	350,301,882	35,030,188	3
DENCM	-25,505,393	-2,550,539	15	USAK	-61,090,427	-6,109,043	16

Table 3 Total, average and ranks on the basis of EVA of sample firms



Table 4 and Table 5 represent EVA figures of all the sample firms for each year. Companies are sorted alphabetically in the tables and their ranks take place in the order of companies for each year.

The firms at the first three positions are Trakya Cam Sanayii A.Ş., CimsaCimentoSanaviveTicaret A.S., and Anadolu Cam Sanayii A.Ş. in 2004; ÇimsaÇimentoSanayiveTicaret A.Ş., Trakya Cam Sanayii A.Ş., and Anadolu Cam Sanayii A.Ş. in 2005: ÇimsaÇimentoSanayiveTicaret A.Ş., NuhÇimentoSanayi A.S., and BatıçimBatıAnadoluÇimentoSanayii A.Ş. in 2006; NuhÇimentoSanayi A.Ş., AkcansaCimentoSanayiveTicaret A.Ş., and ÜnyeÇimentoSanayiveTicaret A.Ş. in 2007; NuhÇimentoSanayi A.Ş., ÜnyeÇimentoSanayiveTicaret A.Ş., and İzocamTicaretveSanayi A.Ş. 2008; NuhÇimentoSanayi A.Ş., CimsaCimentoSanaviveTicaret in A.Ş., and AkçansaÇimentoSanayiveTicaret A.Ş. in 2009; Anadolu Cam Sanayii A.Ş., MardinÇimentoSanayiiveTicaret A.Ş., and ÇimsaÇimentoSanayiveTicaret A.Ş. in 2010; Trakya Cam Sanayii A.Ş., MardinÇimentoSanayiiveTicaret A.Ş., and ÜnyeÇimentoSanayiveTicaret A.Ş. in 2011; ÇimsaÇimentoSanayiveTicaret A.Ş., AkçansaÇimentoSanayiveTicaret A.Ş., and ÜnveCimentoSanaviveTicaret A.S. in 2012; CimsaCimentoSanaviveTicaret A.Ş., AkçansaÇimentoSanayiveTicaret A.Ş., and Adana ÇimentoSanayiiTürk A.Ş. in 2013.

On the other hand, the corporations at the last three positions are ÇimentoSanayiiTürk BatısökeSökeÇimentoSanayii A.Ş., Adana A.Ş, and MardinÇimentoSanayiiveTicaret A.Ş. in 2004; NuhÇimentoSanayi A.Ş., Çimentaş İzmir ÇimentoFabrikasıTürk A.Ş., and Adana ÇimentoSanayiiTürk A.Ş. in 2005; Adana CimentoSanayiiTürk A.Ş., Trakya Cam Sanayii A.Ş., and Bursa CimentoFabrikası A.Ş. in 2006; Anadolu Cam Sanayii A.Ş., Trakya Cam Sanayii A.Ş., and EczacıbaşıYapıGerecleriSanayiveTicaret A.Ş. in 2007; Çimentaş İzmir ÇimentoFabrikasıTürk A.Ş., KütahyaPorselenSanayii A.Ş., and Bursa ÇimentoFabrikası A.Ş. in 2008; Adana ÇimentoSanayiiTürk A.Ş., Çimentaş İzmir ÇimentoFabrikasıTürk A.S., and BatısökeSökeÇimentoSanayii A.Ş. in 2009; AfyonÇimentoSanayi T.A.Ş., NuhÇimentoSanayi A.Ş., and EczacıbaşıYapıGereçleriSanayiveTicaret A.Ş. in 2010; AslanÇimento A.Ş., NuhÇimentoSanayi A.Ş., and EczacıbaşıYapıGereçleriSanayiveTicaret A.Ş. in 2011; Trakya Cam Sanayii A.Ş., Anadolu Cam Sanayii A.Ş., and UşakSeramikSanayii A.Ş. in 2012; Trakya Cam Sanayii A.Ş., Anadolu Cam Sanayii A.Ş., and Denizli Cam SanayiiveTicaret A.Ş. in 2013.



86 16 80 2 36 14 66 13 60 15
116,075,080 -508,862,127 30,133,836 32,727,068 16,085,560
3 10 8 10 8 11 8 10 8 10 8 10 8 10 8 10
22,793,703 30,353,463 36,945,770 22,793,703
11 11
6,100,729 16,255,228
26

Table 4 Annual EVA and EVA-based ranking of sample firms for the period 2004 through 2008



	2009		2010		2011		2012		2013	
EVA R	2	ank	EVA	Rank	EVA	Rank	EVA	Rank	EVA	Rank
-134,664,356		26	9,565,147	6	12,041,194	12	12,289,888	11	57,136,822	3
-2,126,387		12	-1,116,021,020	26	-6,161,462	22	-7,423,222	20	2,044,443	20
30,048,278		з	5,857,288	11	16,427,441	6	65,074,343	2	119,812,888	2
-60,921,640		22	60,580,443	1	34,090,974	5	-164,650,784	25	-8,232,103	25
-34,846,756		19	2,372,167	14	-1,844,969,473	26	34,597,721	4	30,185,560	11
17,247,964		16	8,202,511	10	17,594,556	8	20,994,024	8	45,020,038	L
-76,549,249		24	-1,312,714	17	-2,865,051	21	-2,558,822	19	10,391,606	17
-37,695,847		00	4,730,652	12	10,143,852	13	-15,706,615	22	25,772,956	13
-13,933,629	[5	-6,966,847	22	37,881,141	4	1,236,922	15	39,255,950	8
43,738,186		2	43,246,685	3	7,443,428	15	94,085,500	1	260,205,005	1
-4,691,020 1.	1.	3	-4,285,728	21	8,683,423	14	-773,104	17	3,103,768	19
-94,057,027 25	2;	2	1,067,700	15	14,249,567	10	2,331,326	14	45,293,438	9
-1,218,297 1(1(-1,898,480	19	-336,541	19	-7,863,852	21	-4,463,047	24
-1,133,200	0	~	-3,426,648	20	-1,131,400	20	-893,983	18	-967,733	22
-24,863,948 18	18	\sim	-29,816,793	24	-34,768,103	24	14,821,658	10	35,220,389	6
-2,033,330 11	11		11,575,657	8	12,751,001	11	17,556,419	6	23,661,823	15
-11,369,099 14	14		-8,916,226	23	-11,765,311	23	12,202,953	12	30,670,319	10
-486,160		8	-455,924	16	2,311,325	17	-641,321	16	4,311,675	18
25,805,665	-	4	27,946,214	5	31,105,258	9	21,132,003	7	27,866,517	12
10, 149, 499		9	23,096,162	7	23,080,697	7	23,378,681	9	23,866,895	14
-19,353,809		17	-1,692,758	18	3,970,959	16	3,401,895	13	14,786,635	16
16,499,383		5	57,142,106	2	56,944,389	2	24,470,143	5	52,022,908	4
59,205,768		1	-61,633,233	25	-36,026,227	25	-61,159,775	23	-3,210,775	23
-76,268,975		23	26,396,171	9	89,456,869	1	-294,544,537	26	-217,629,377	26
-46,862,514		21	32,745,060	4	42,476,188	3	50,453,380	3	51,473,329	5
3,239,543		7	3,235,548	13	2,112,138	18	-73,767,902	24	-551,259	21
		l								

Table 5 Annual EVA and EVA-based ranking of sample firms for the period 2009 through 2013



Discussion on frequency distribution based on EVA

Table 6 demonstrates the EVA based frequency distribution of firms. It can be seen that there are 20 corporations which are the highest number of wealth creators in 2013. Moreover, there are 19 entities which are the highest number of wealth destroyers in 2009 and 17 in 2008. Besides, it is obvious that positive EVA was reported by 20 firms in 2013; 19 companies in 2007; 18 corporations businesses in the years 2006 and 2011; 16 entities in the years 2004 and 2005, and also 15 firms in the years 2010 and 2012.

Furthermore, it is apparent from the table in 2009, just 7 and in 2008, only 9 out of a total of 26 corporations stated positive EVA. However, it is examined that negative EVA was reported by 19 firms in 2009; 17 corporations in 2008; 11 entities in the years 2010 and 2012; 10 firms in the years 2004 and 2005; and also 8 companies in the years 2006 and 2011. Additionally, it can be clear that in 2007, only 7 and in 2013 just 6 out of a total of the 26 firms stated negative EVA.

EVA (million TL)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	Average	%
Negative	10	10	8	7	17	19	11	8	11	6	107	10.7	41.15
0-10	5	4	4	3	3	1	7	5	3	3	38	3.8	14.62
10 – 25	6	5	4	2	2	2	2	7	8	4	42	4.2	16.15
25 – 50	2	4	6	8	3	3	4	4	1	8	43	4.3	16.54
50 – 100	3	3	2	4	0	1	2	2	3	3	23	2.3	8.85
100 – 200	0	0	2	2	1	0	0	0	0	1	6	0.6	2.31
Above 200	0	0	0	0	0	0	0	0	0	1	1	0.1	0.39
Total	26	26	26	26	26	26	26	26	26	26	260	26	100

Table 6 Frequency distribution of sample firms based on EVA

In accordance with Table 7, below the average, approximately 41% of the sampled entities reported negative EVA over the period 2004-2013. Additionally, about 56% companies generated EVA up to 100,000,000 TL whereas approximately 2% achieved in generating EVA between 100,000,000 TL and 200,000,000 TL. There is one company that generated EVA above 200,000,000 TL.

EVA	Percentage
Negative	41.15%
0-100,000,000 TL	56.16%
100,000,000-200,000,000 TL	2.31%
Above 200,000,000 TL	0.39%



Discussion on descriptive statistics regarding EVA

Table 8 illustrates descriptive statistics for EVA. The results have been illustrated as metrics of variability, including range and standard deviation. Moreover, metrics of central tendency, including mean and median have been shown in the following table. The figures of range present volatility which is the difference between the highest and the smallest figures. It is apparent that the minimum values being throughout found to be negative, ranging from -1,116,021,020 TL to 134,664,356 TL. Additionally, the maximum values are positive, ranging between 58,567,857 TL and 260,205,005 TL. Besides, there is a negative mean and a negative sum for the period 2004-2013, except 2006 and 2013. Moreover, median EVA values are generally positive over the period 2004-2013, except 2008 and 2009.

The variation of data points from mean value is determined by standard deviation. High standard deviation figures of EVA demonstrate that data points are far from mean figure (Kaur and Narang, 2009). In Table 8, the large distinction between EVA figures of best and worst performing firms in each year within the framework of the study is that positive EVA worth (89,456,869 TL) was reported by Trakya Cam Sanayii A.Ş. in 2011, whilst in the same year, negative EVA worth (-1,844,969,473 TL) was reported by AslanÇimento A.Ş. Thus, the high standard deviation value was observed in 2011 that was 365,337,824.5 TL.

Year	Range	Minimum	Maximum	Mean	Median	Sum	Std. Deviation
2004	397959442	-339391585	58567857	-13596589.96	4986156.50	-353511339	83457088.38
2005	381962771	-297273498	84689273	-6510756.65	9440404.00	-169279673	86637656.65
2006	305696046	-182316958	123379088	5129760.62	15189119.50	133373776	69539394.51
2007	677419273	-508862127	168567146	-37653443.65	31430452.00	-97898935	145013530.2
2008	724455359	-615842123	108613236	-52225181.81	-4875595.00	-1357854727	165289902.0
2009	193870124	-134664356	59205768	-18139880.19	-8030059.50	-471636885	43664906.75
2010	1176601463	-1116021020	60580443	-35333340.77	2803857.50	-91866860	221824542.3
2011	1934426342	-1844969473	89456869	-58279198.77	9413637.50	-1515259168	365337824.5
2012	388630037	-294544537	94085500	-8921425.42	2866610.50	-231957061	75115791.19
2013	477834382	-217629377	260205005	25655718.08	24819925.50	667048670	72848175.87

Table 8 Descriptive	statistics of	EVA of	sample firms
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Discussion on Dependent and Independent Variables Based Directions

In Table 9, 10, 11, 12, and 13 directions of sample companies are provided on the annual basis of EVA, EPS, ROA, basic earning power (BEP), ROE, gross profit margin (GPM), operating



profit margin (OPM), and net profit margin (NPM). It is obvious that the dependent and independent values do not always move in the identical direction.

In accordance with Table 9, it can be clear that ROA, BEP, ROE, OPM, and NPM of the whole firms are in the similar direction during the year 2004. Further, it is apparent that EPS, ROA, ROE, and NPM of sample firms are in the same direction whilst BEP and OPM are in the same direction for the year 2005.

Regarding to Table 10, it is evident that EPS, ROA, ROE, and NPM of the sample companies are in the similar direction whereas BEP and OPM are in the same direction in 2006. Moreover, it can be seen that EPS, ROA, ROE, and NPM of all the sample firms are in the same direction; however BEP and OPM are in the similar direction during the year 2007.

According to Table 11, it can be obvious that EPS, ROA, ROE, and NPM of the whole companies are in the same direction; while BEP and OPM are in the same direction in 2008. In addition, it is clear that EPS, ROA, ROE, and NPM of the sample firms are in the similar direction; whilst BEP and OPM are in the similar direction for the year 2009.

It is seen on Table 12 that EPS, ROA, ROE, and NPM of the sample companies are in the similar direction; whereas BEP and OPM are in the same direction in the year 2010. Besides, it can be apparent that EPS, ROA, and ROE of all the firms are in the same direction; however BEP and OPM are in the identical direction during the year 2011.

From Table 13, it can be evident that EPS, ROA, BEP, ROE, OPM, and NPM of the whole companies are in the same direction in 2012. Furthermore, it is obvious that EPS, ROA, ROE, and NPM of the sample firms are in the identical direction while BEP and OPM are in the same direction for the year 2013.



Year				6	004							20	05			
Stock code	EVA	EPS	ROA	BEP	ROE	GPM	MAO	MAN	EVA	EPS	ROA	BEP	ROE	GPM	MdO	MqN
ADANA	1	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
AFYON	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
AKCNS	+	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
ANACM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ASLAN	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BOLUC	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BSOKE	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BTCIM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BUCIM	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
CIMSA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
CMBTN	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
CMENT	+	+	+	+	+	+	+	+	·	+	+	+	+	+	+	+
DENCM	ı	ı	I	-	ı	+	I	I	1	+	+	ı	+	+	-	+
DOGUB	-	+	I	-		+	I	I	-	I	ı	ı	I	+	-	
ECYAP	-	+	I	-	ı	+	I	ı	-	I	ı	ı	I	+	-	ı
EGSER	+	+	+	+	+	+	+	+	·	+	+	+	+	+	+	+
GOLTS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HZNDR	ı	I	I	ı	ı	+	ı	ı	-	ı	ı	ı	I	+	-	ı
IZOCM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KONYA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KUTPO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MRDIN	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
NUHCM	+	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
TRKCM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
UNYEC	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
USAK	+	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+

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Table 9 Directions based on variables in 2004 and in 2005



Table 10 Directions based on variables in 2006 and in 2007

Year				7	006							20	60			
	EVA	EPS	ROA	BEP	ROE	GPM	MdO	MAN	EVA	EPS	ROA	BEP	ROE	GPM	MdO	MAN
	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ι.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
I	+	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
_ .	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	ı	I	I	I	I	+		
	I	ı	I	I	ı	+	I	I	I	I	T	I	I	+		
	ı	+	+	I	+	+	I	+	ı	I	ı	I	I	+		ı
	I	ı	I	I		+	I	I	I	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	I	I	+	I	+	+	ı
•	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	I	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+
_	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
I	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
I	I	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
• •	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	+	I	I	I	I	+	I	I	+	+	+	+	+	+	+	+



Year				0	008							20	60			
Stock code	EVA	EPS	ROA	BEP	ROE	GPM	MdO	MAN	EVA	EPS	ROA	BEP	ROE	GPM	MAO	MAN
ADANA	1	+	+	+	+	+	+	+	1	+	+	+	+	+	+	+
AFYON	ı	+	+	+	+	+	+	+	I	I	I	I	I	+	I	ī
AKCNS	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ANACM	ı	ı	ı	+	1	+	+	I	ı	+	+	+	+	+	+	+
ASLAN	+	+	+	+	+	+	+	+	I	I	I	I	I	+	I	ı
BOLUC	+	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+
BSOKE	ı	+	+	+	+	+	+	+	I	+	+	ı	+	+	I	+
BTCIM	ı	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+
BUCIM	ı	+	+	+	+	+	+	+	I	+	+	ı	+	+	I	+
CIMSA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
CMBTN	ı	I	1	ı	ı	+	1	I	I	I	I	I	I	+	I	I
CMENT	ı	I	ı	+	ı	+	+	I	I	+	+	+	+	+	+	+
DENCM	ı	I	ı	ı	ı	+	I	I	I	I	I	I	I	+	I	ı
DOGUB	ı	I	1	ı	ı	ı	I	I	I	I	I	ı	I	I	I	ı
ECYAP	ı	I	1	ı	ı	+	I	I	I	I	I	+	I	+	+	ı
EGSER	ı	I	ı	ı	ı	+	I	I	ı	+	+	+	+	+	+	+
GOLTS	I	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+
HZNDR	+	I	ı	+	ı	+	+	I	ı	ı	-	+	-	+	+	I
IZOCM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KONYA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KUTPO	ı	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
MRDIN	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
NUHCM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
TRKCM	ı	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
UNYEC	+	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
USAK	+	I	1	+	ı	+	+	I	+	+	+	+	+	+	+	+

Table 11 Directions based on variables in 2008 and in 2009



Table 12 Directions based on variables in 2010 and in 2011

	MAN	ı	+	+	+	+	+	+	+	+	+	+	+	1	-	+	+	+	+	+	+	+	+	+	+	+	+
	MdO	+	I	+	+	+	+	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+	+	+	+	+	+
	MdÐ	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
11	ROE	+	I	+	+	+	+	+	+	+	+	+	+	+	I	I	+	+	+	+	+	+	+	+	+	+	+
20	BEP	+	ı	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
	ROA	+	I	+	+	+	+	+	+	+	+	+	+	+	-	I	+	+	+	+	+	+	+	+	+	+	+
	EPS	+	I	+	+	+	+	+	+	+	+	+	+	+	-	I	+	+	+	+	+	+	+	+	+	+	+
	EVA	+	I	+	+	-	+	-	+	+	+	+	+	I	-	-	+	-	+	+	+	+	+	-	+	+	+
	MAN	+	+	+	+	+	+	+	+	+	+	-	+	+	-	ı	+	+	-	+	+	+	+	+	+	+	+
	MdO	+	ı	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
	GPM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2010	ROE	+	+	+	+	+	+	+	+	+	+	-	+	+	-	I	+	+	-	+	+	+	+	+	+	+	+
	BEP	+	I	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
	ROA	+	+	+	+	+	+	+	+	+	+	-	+	+	-	I	+	+	•	+	+	+	+	+	+	+	+
	EPS	+	+	+	+	+	+	+	+	+	+	-	+	+	-	I	+	+	I	+	+	+	+	+	+	+	+
	EVA	+	I	+	+	+	+	ı	+	I	+	ı	+	I	ı	I	+	ı	ı	+	+	ı	+	ı	+	+	+
Year	Stock code	ADANA	AFYON	AKCNS	ANACM	NALAN	BOLUC	BSOKE	BTCIM	BUCIM	CIMSA	CMBTN	CMENT	DENCM	DOGUB	ECYAP	EGSER	GOLTS	HZNDR	IZOCM	KONYA	KUTPO	MRDIN	NUHCM	TRKCM	UNYEC	USAK



Year				7	012							20	13			
Stock code	EVA	EPS	ROA	BEP	ROE	GPM	MdO	MqN	EVA	EPS	ROA	BEP	ROE	GPM	MAO	MqN
ADANA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
AFYON	ı	I	1	I	1	I	ı	ı	+	+	+	+	+	+	+	+
AKCNS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ANACM	ı	+	+	+	+	+	+	+	1	+	+	+	+	+	+	+
ASLAN	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BOLUC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BSOKE	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BTCIM	ı	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
BUCIM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
CIMSA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
CMBTN	ı	I	1	I	1	+	ı	ı	+	+	+	+	+	+	+	+
CMENT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DENCM	ı	ı	I	I	ı	+	1	ı	I	ı	I	I	I	+	ı	ı
DOGUB	ı	I	I	I	ı	+	ı	ı	I	ı	I	I	I	+	I	ı
ECYAP	+	+	+	+	+	+	+	+	+	ı	I	+	I	+	+	ı
EGSER	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
GOLTS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HZNDR	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IZOCM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KONYA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KUTPO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MRDIN	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
NUHCM	1	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
TRKCM	1	+	+	+	+	+	+	+	ı	+	+	+	+	+	+	+
UNYEC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
USAK		+	+	+	+	+	+	+				+		+	+	

Table 13 Directions based on variables in 2012 and in 2013



Discussion on Regression Analyses regarding Dependent Variables

In this study, dependent variables of the sample firms, namely EVA, EVA/Total assets, EVA/Total equity, and EVA/Sales, are taken into consideration, while seven performance measures in the relative information content test, EPS, ROA, basic earning power, ROE, gross profit margin, operating profit margin, and net profit margin are defined as independent variables. Separate regressions are run for all the 10 years taking the whole sample firms together. Moreover, values of adjusted R squares show the amount of variability in the dependent variable explained by the model (Kaur and Narang, 2009). Relative information content is evaluated by comparing adjusted R squares from separate regressions, one for each annual performance metric.

Discussion on regression analyses based on EVA and EPS

According to Table 14, it is apparent that p-values of the whole sample are bigger than 0.05 during the entire study. Thus, it can be said that EVA and EPS are irrelevance. This means EPS cannot be used to predict EVA because there is a big difference between EVA based performance evaluation and EPS.

	R ²	Adjusted R ²	Beta	Sig.
2004	0.028	-0.013	0.167	0.414
2005	0.013	-0.028	0.116	0.573
2006	0.034	-0.006	0.184	0.367
2007	0.039	-0.001	0.198	0.332
2008	0.032	-0.009	0.178	0.385
2009	0.020	-0.020	0.143	0.485
2010	0.008	-0.034	0.087	0.674
2011	0.006	-0.036	0.076	0.713
2012	0.028	-0.012	0.167	0.414
2013	0.041	0.001	0.202	0.323

Table 14 Regression results of linkage between EVA and EPS

Discussion on regression analyses based on EVA/total assets and ROA

As it is seen on Table 15, it can be evident that p-values are bigger than 0.05, except three years. It can be said that ROA is irrelevant to EVA/Total assets during the years 2004, 2005, 2006, 2008, 2009, 2010, and 2011. However, *p*-values being less than 0.05 depict the relationship between EVA/Total assets and ROA in the years 2007, 2012, and 2013. In addition to this, *p*-values in the years 2012 and 2013 show the relationship between EVA/Total assets



and ROA to be significant at 1% level because they are less than 0.001. Moreover, the results present positive betas (regression coefficients) for these three years expressing a positive association between EVA/Total assets and ROA. Furthermore, when analyzing values of adjusted R^2 , they are also bigger in these three years than other years. In 2007, ROA explains about 33.2% of the change in EVA/Total assets. In 2012, ROA explains about 41.5% of the change in EVA/Total assets. Lastly, in 2013, ROA explains about 78.3% of the change in EVA/Total assets.

	R ²	Adjusted R ²	Beta	Sig.
2004	0.031	-0.010	0.175	0.392
2005	0.092	0.055	0.304	0.131
2006	0.049	0.009	0.221	0.279
2007	0.332	0.304	0.576	0.002
2008	0.026	-0.015	0.160	0.435
2009	0.083	0.045	0.288	0.154
2010	0.018	-0.023	0.134	0.515
2011	0.010	-0.031	0.102	0.621
2012	0.415	0.391	0.644	0.000
2013	0.783	0.774	0.885	0.000

Table 15 Regression results of linkage between EVA/total assets and ROA

Discussion on regression analyses based on EVA/total assets and basic earning power

From Table 16, it is obvious that p-values are bigger than 0.05, except three years. It can be said that EVA/Total assets and basic earning power are irrelevance during the years 2004, 2005, 2006, 2008, 2009, 2010, and 2011. Nonetheless, p-values which are less than 0.05 display the relationship between EVA/Total assets and basic earning power in the years 2007. 2012, and 2013. Additionally, p-values during these three years demonstrate the relationship between EVA/Total assets and basic earning power to be significant at 1% level. Furthermore, the results exhibit positive betas(regression coefficients) for these three years representing a positive association between EVA/Total assets and basic earning power. Moreover, when examining values of adjusted R², they are also bigger in these three years than other years. In 2007, basic earning power explains about 32.6% of the change in EVA/Total assets. In 2012, basic earning power explains about 41.4% of the change in EVA/Total assets. Finally, in 2013, basic earning power explains about 82.2% of the change in EVA/Total assets.



	R ²	Adjusted R ²	Beta	Sig.
2004	0.021	-0.020	0.144	0.482
2005	0.140	0.105	0.375	0.059
2006	0.038	-0.003	0.194	0.343
2007	0.353	0.326	0.594	0.001
2008	0.053	0.014	0.231	0.257
2009	0.128	0.092	0.358	0.073
2010	0.037	-0.004	0.191	0.349
2011	0.005	-0.037	0.070	0.733
2012	0.437	0.414	0.661	0.000
2013	0.829	0.822	0.911	0.000

Table 16 Regression results of linkage between EVA/total assets and basic earning power

Discussion on regression analyses based on EVA/total equity and ROE

Regarding to Table 17, it can be apparent that *p*-values are bigger than 0.05, except four years. It can be said that ROE is irrelevant to EVA/Total equity during the years 2005, 2006, 2008, 2010, 2011, and 2013. On the other hand, p-values, that are less than 0.05, present the relationship between EVA/Total equity and ROE in the years 2004, 2007, 2009, and 2012. Moreover, the results show positive betas (regression coefficients) for these four years implying a positive association between EVA/Total equity and ROE. Furthermore, when analyzing values of adjusted R², they are also bigger in these four years than other years. In 2004, ROE explains about 13.9% of the change in EVA/Total equity. In 2007, ROE explains about 24.6% of the change in EVA/Total equity. In 2009, ROE explains about 24.3% of the change in EVA/Total equity. Lastly, in 2012, ROE explains about 24.0% of the change in EVA/Total equity.

abl	e 17 Reg	ression resul	ts of linkage betw	veen EVA/tot	al equity and ROE
		R ²	Adjusted R ²	Beta	Sig.
	2004	0.174	0.139	0.417	0.034
	2005	0.068	0.029	0.261	0.197
	2006	0.071	0.032	0.266	0.189
	2007	0.276	0.246	0.525	0.006
	2008	0.017	-0.024	0.130	0.525
	2009	0.274	0.243	0.523	0.006
	2010	0.016	-0.025	0.126	0.540
	2011	0.009	-0.032	0.095	0.644
	2012	0.270	0.240	0.520	0.006
	2013	0.003	-0.039	-0.054	0.794

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Discussion on regression analyses based on EVA/sales and gross profit margin

In accordance with Table 18, it is evident that *p*-values are bigger than 0.05, except three years. It can be said that EVA/Sales and gross profit margin are irrelevance during the years 2004, 2005, 2006, 2008, 2009, 2010, and 2011. Nevertheless, p-values being less than 0.05 depict the relationship between EVA/Sales and gross profit margin in the years 2007, 2012, and 2013. Furthermore, the results display positive betas (regression coefficients) for these three years expressing a positive association between EVA/Sales and gross profit margin. Moreover, when examining values of adjusted R², they are also bigger in these three years than other years. In 2007, gross profit margin explains about 22.3% of the change in EVA/Sales. In 2012, gross profit margin explains about 11.6% of the change in EVA/Sales. Finally, in 2013, gross profit margin explains about 20.3% of the change in EVA/Sales.

	R ²	Adjusted R ²	Beta	Sig.
2004	0.001	-0.040	0.037	0.858
2005	0.093	0.056	0.306	0.129
2006	0.022	-0.019	0.149	0.468
2007	0.254	0.223	0.504	0.009
2008	0.137	0.101	0.370	0.063
2009	0.121	0.085	0.348	0.081
2010	0.070	0.032	0.265	0.191
2011	0.003	-0.039	-0.053	0.796
2012	0.152	0.116	0.389	0.049
2013	0.235	0.203	0.485	0.012

Table 18 Regression results of linkage between EVA/sales and gross profit margin

Discussion on regression analyses based on EVA/sales and operating profit margin

As seen on Table 19, it can be obvious that p-values are bigger than 0.05, except five years. It can be said that operating profit margin is irrelevant to EVA/Sales during the years 2004, 2005, 2006, 2008, 2010, and 2011. However, p-values which are less than 0.05 demonstrate the relationship between EVA/Sales and operating profit margin in the years 2007, 2008, 2009, 2012, and 2013. In addition to this, p-values in the years 2008, 2012, and 2013 exhibit the relationship between EVA/Sales and operating profit margin to be significant at 1% level. Moreover, the results show positive betas (regression coefficients) for these five years showing a positive association between EVA/Sales and operating profit margin.



Furthermore, when analyzing values of adjusted R^2 , they are also bigger in these five years than other years. In 2007, operating profit margin explains about 16.5% of the change in EVA/Sales. In 2008, operating profit margin explains about 36.4% of the change in EVA/Sales. In 2009, operating profit margin explains about 16.9% of the change in EVA/Sales. In 2012, operating profit margin explains about 48.3% of the change in EVA/Sales. Last but not least, in 2013, the change in EVA/Sales is explained by operating profit margin at highest level that is 90.8%.

-	R ²	Adjusted R ²	Beta	Sig.
2004	0.004	-0.038	-0.060	0.770
2005	0.074	0.036	0.272	0.178
2006	0.024	-0.017	0.153	0.455
2007	0.198	0.165	0.445	0.023
2008	0.390	0.364	0.624	0.001
2009	0.202	0.169	0.450	0.021
2010	0.032	-0.008	0.180	0.379
2011	0.000	-0.042	-0.012	0.953
2012	0.504	0.483	0.710	0.000
2013	0.912	0.908	0.955	0.000

Table 19 Re	earession	results of	linkage	between	EVA /sales	and o	perating	profit	margin
	- 3								

Discussion on regression analyses based on EVA/sales and net profit margin

It is apparent from Table 20 that *p*-values are bigger than 0.05, except four years. It can be said that EVA/Sales and net profit margin are irrelevance during the years 2004, 2005, 2006, 2009, 2010, and 2011. Nonetheless, p-values, that are less than 0.05, present the relationship between EVA/Sales and net profit margin in the years 2007, 2008, 2012, and 2013. Additionally, p-values in the years 2008, 2012, and 2013 display the relationship between EVA/Sales and net profit margin to be significant at 1% level. Moreover, the results demonstrate positive betas (regression coefficients) for these four years implying a positive association between EVA/Sales and net profit margin.

Furthermore, when analyzing values of adjusted R², they are also bigger in these four years than other years. In 2007, net profit margin explains about 14.6% of the change in EVA/Sales. In 2008, net profit margin explains about 33.3% of the change in EVA/Sales. In 2012, net profit margin explains about 39.6% of the change in EVA/Sales. Last but not least, in 2013, the change in EVA/Sales is explained by net profit margin at highest level which is 89.5%.



	R ²	Adjusted R ²	Beta	Sig.
2004	0.000	-0.042	0.005	0.980
2005	0.054	0.014	0.232	0.254
2006	0.018	-0.023	0.134	0.514
2007	0.180	0.146	0.425	0.031
2008	0.359	0.333	0.599	0.001
2009	0.142	0.106	0.376	0.058
2010	0.019	-0.022	0.137	0.505
2011	0.001	-0.041	0.024	0.906
2012	0.420	0.396	0.648	0.000
2013	0.900	0.895	0.948	0.000

Table 20 Regression results of linkage between EVA/sales and net profit margin

CONCLUSION

Research for value evaluation indicate that the awareness rate of managers about the limitations of traditional accounting measurement tools, such as return on sales, return on equity, return on assets, increases. The introduction of EVA can be accepted as one of the most important financial management innovations of the past decade. Both management interest and academic study have been stimulated by EVA. It considers costs of both debt and equity for the measurement of created value, so this constitutes the most important superiority of EVA against traditional performance measurement methods.

EVA is an accounting based method in measuring operating performance as periodical. With this method, financial performance is measured depending on factors, namely NOPAT, assets investments required to obtain this profit and cost of investment made in these assets (WACC). Under the scope of EVA, it is stated that the company should generate the profit above the cost of capital in order to create economic value. Besides, EVA can be used to measure the performance of the overall firm and business units as well as to measure the competitive power of corporations. The value based management approach finds out whether companies use their own sources for the purpose or not.

One of the most significant claims is that there is a high association between increase in investment and increase in wealth creation. Moreover, investment has a correlation with ROE. On the other hand, there is not association between increases in investment and increases in ROA. It can be revealed that EVA has an association with ROE whereas there is not a relationship between EVA and ROA. In order to evaluate these claims, this study utilizes 26 firms for 10 years over the period 2004-2013.



While average EVA is taken as the base, the first three wealth creators and the last three wealth destroyers in Turkish Non-Metallic Mineral Products Industry listed at Borsa Istanbul, Tureky, regarding companies are figured out over the 10 years period. ÇimsaÇimentoSanayiveTicaret A.Ş., AkçansaÇimentoSanayiveTicaret A.Ş. and ÜnyeÇimentoSanayiveTicaret A.Ş. have been reported high average EVA figures. Nevertheless, AslanCimento A.S., AfyonCimentoSanayi T.A.Ş. and Trakya Cam Sanayii A.Ş. have been reported low average EVA figures for the period 2004 to 2013.

Besides, during the investigated ten-year period, it can be seen that nearly 59% of the sample firms representing the wealth of Turkish Non-Metallic Mineral Products Industry of Borsa Istanbul created their shareholders' wealth. Moreover, when descriptive statistics are analyzed, there are 20 companies which have a positive EVA value in 2013. Thus, the highest mean is observed in 2013. However, it is seen that the lowest mean is obtained in 2011.

Furthermore, it is obtained that dependent and independent values do not always move in the similar direction. Nonetheless, when the directions of the variables are examined for separate year, ROA and ROE are in the same direction for each year. Similarly, basic earning power and operating profit margin are in the identical direction for each year.

Findings of the study revealed that EVA and EPS are not interrelated for Turkish Non-Metallic Mineral Products Industrial companies of Borsa Istanbul during the period 2004-2013. Moreover, it is apparent that EVA has a positive association with ROA, basic earning power, and gross profit margin in 2007, 2012, and 2013. EVA has a positive relationship with ROE in 2004, 2007, 2009, and 2012. Additionally, EVA has a positive association with operating profit margin in 2007, 2008, 2009, 2012, and 2013. The last but not least, EVA has a positive relationship with net profit margin in 2007, 2008, 2012, and 2013. Therefore, in 2007 and 2012, EVA has a positive relation with each independent variable, except EPS.

In 2013, it is seen that there is a higher association between EVA and each independent variable, except EPS and ROE. The association levels of EVA to operating profit margin, net profit margin, basic earning power, ROA, and gross profit margin are obtained as 90.8%, 89.5%, 82.2%, 77.4%, and 20.3%, respectively for Turkish Non-Metallic Mineral Products Industrial companies of Borsa Istanbul, Turkey.

As a concluding remark, limitations of the study should be enlightened. The foremost limitation encountered was the number of years included within the scope of the research. Although data used in the research included financial statements and disclosures for 26 publicly traded at Borsa Istanbul firms of Turkish Non-Metallic Mineral Products Industry, covering only a period of 10 years, from 2004 to 2013 constituted a limitation.



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