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Portfolio Creation Based on Valuable Financial Criteria: An Analysis on the BIST Artificial Index

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Abstract:
EVA, MVA, CFROI and CVA value-based financial criteria can be used both by investors and executives in many areas like performance measurement, determination of managers' wages, communication with shareholders and investors, motivation of managers, decision-making for capital budgeting, company valuation and etc. In the literature, the selection of stocks that will take part in portfolio is one of the fields which is commonly discussed and in which many methods are suggested and various studies is carried out about.
The main purpose of this study is the determination of stocks, which will take part in portfolio, by using value-based financial performance criteria. At this point, during research period, by using those criteria some portfolios were created from stocks which have the highest value and their returns were compared from various perspectives. The universe of the study is industrial businesses which are listed in BIST 100 index. The analyses were conducted and commented through annually data of businesses between 2010-2014 years. The findings show that the return on portfolios which composed by using value-based performance criteria are relatively higher than the returns within the scope of index. Moreover, it is seen that the portfolios which is created by EVA values have the highest rate of return among those criteria.

Keywords: Performance, Measurement, Portfolio, Value-Based Criteria, Investors

1. Introduction

The main anticipation of investors in financial markets is maximization of proceeds. One of the main decision-making areas of investors investing in the stock market is which share certificates will be included in the creation of portfolios providing maximum proceeds. In other words, what criteria or criteria will be used as the main problem in the selection of the securities to be taken into consideration.

There has been a series of developments in finance theory in recent years. One of these developments suggests that the main purpose of the companies is to maximize the prosperity of the partners. This view has led to the importance of value-based management that is one of the financial management models. Therefore, maximizing the value of maximizing profits has come to the forefront. The development of scale-based measures can be considered as an effort to increase business value more effectively and objectively. With this understanding it has become a necessity to consider the concept of value in the selection of the shares to be placed in the portfolio of investors.

Value-added management measures including economic value added (EVA), market value added (MVA), cash value added (CVA) and cash flow proceeds on investment (CFROI) are used for shareholder value measurements. The main motivation of this study is that a high proceeds portfolio can be created by using the share valuation of these criteria in the selection of share certificates. In this context, the criteria used in the selection of the stocks that will constitute the portfolio are aimed to create a portfolio that will yield higher proceeds than BIST industrial index.

EVA, MVA, CVA and CFRIO values based on the value-based measures were calculated for the years 2010-2014 in this study on firms traded on the BIST industrial index. According to all the criteria, portfolio companies were created with the highest values. The proceeds of the created portfolios are compared with the proceeds of the industrial indices calculated separately for each year according to years. The ability of portfolio to create shareholder value and whether a profitable portfolio could be created or not if the corresponding criteria were used were analyzed.

The study consists of four basic parts. In the following section, the theoretical dimension about value-based performance measures is given in the conceptual framework. In the third chapter, literature review on the subject is summarized. In the application part of the study, the data structure and methodology of the research period are given and the findings obtained are interpreted. In the last part of the study, the result part was mentioned and evaluations were made on the findings.

2. Conceptual Framework: Value Based Financial Performance Measures

The EVA, MVA, CVA and CFROI measures are emerging as the most commonly used value-based financial performance measures in financial literature. EVA concept was developed by Stern & Stewart Co Consulting Group in 1980s. Unlike traditional performance measures based on accounting profits, EVA, which is a kind of financial measure, is based on profitability and is based on economic profit because it is developed based on the true profitability of companies. In this context, it considers both the debt and the cost of own capital (Grant, 1997).

EVA, which allows companies to determine whether they earn operating profits over their investments for annual or shorter periods, is the most common measure used to accurately measure and provide ease of use among value-based performance measures (Yılgör, 2005). In the literature, it is known that EVA is a very strong indicator in explaining the change in the share price (Ergincan, 2001, Ehrbar 1999a, Chen and Dodd 1997, Yook and McCabe 2001, Dutta and Reichelstein 2005, Hejazi and Oskouei 2007, Xin, Ting and Yuan 2012, Alipour and Pejman, 2015, Berzakova, Bartosova and Kicova 2015, Lee and Kim 2009). EVA that have an important place among the financial performance measures is a much more successful measure in explaining the change in shareholder value, and performance in cash flow per share compared to earnings per share, profit margin and equity ratio. Investors, who are aiming to earn more than the cost of capital, prefer to invest in firms with EVA rising (Tully, 1998). EVA can be defined as the difference between the operator's net operating profit after tax (NOPAT) and the financial requirement of the operator. Accordingly, EVA calculation is as follows;

$$EVA = Net\ Operating\ Profit\ After\ Tax\ - (WACC\ x\ TIC)$$

In here, financial requirements expressed as multiplication of weighted average cost of capital (WACC) and total invested capital (TIC). While traditional accounting profit measurement methods, such as net profit, take into account tax and non-interest income and, in addition, depreciation; EVA considers net operating profit after tax (Grant, 2003).

MVA is the most common criterion after EVA. MVA which based on the idea that the fortunes of firm owners can only be maximized if the difference between the total value of the company and the total capital is increased is considered to be one of the most important of the value-based criteria by many managers who are focusing on creating value. According to Shawn (1994), MVA is considered the best measure of how value creation is valued for shareholders whose primary purpose is a company. It shows how much the current and future value of the company is reflected in the market value of the company. Therefore, it is a cumulative measure. In other words, it aims to measure the wealth created by the company for investors, cumulatively.

MVA can also be expressed as the difference between the market value of the employer and the amount of capital invested by the stakeholders in the operation (Mahdi and Sheikholeslami, 1994). MVA also shows how management brings the business to a long-term perspective. Because it expresses the present value of the cash inflows expected by the MVA operator in the long run (Ehrbar, 1999b). For positive MVA formation; the proceeds needs to overtake the invested capital. Thus, the share certificate will be traded at a higher value than the value of the first purchase, which will increase stakeholder value (Tully 1994). In the financial literature, MVA can also be formulated as follows (Yook; McCabe 2001):

$$MVA = Total\ Market\ Value - Total\ Invested\ Capital$$

If we open the total market value, the MVA can be expressed more clearly. In this context, the formula can be arranged as follows (Evans 1999; Friedlob; Schleifer; Plewa, 2002):

$$MVA = (Market\ Value\ of\ Debt + Market\ Value\ of\ Equity) - Total\ Invested\ Capital$$

At a time, the market value of the company is expressed by the sum of the market value of its debt and its equity.

Another value-based criterion is the CVA. CVA, which basically is based on cash flows, measures the economic profit created as more precise than EVA. The basic rationale for the development of CVA financial performance measures; the idea is that it should be benefit from the cash flow at every stage of measuring company performance.

CVA can be calculated in different ways by two different consulting companies. The first one is the CVA calculation method developed by Erik Ottoson and Fredrik Weissenrieder. This method is also called Anelda AB method. According to this method, CVA is defined as the difference between Operating Cash Flow (OCF) and Operating Cash Flow Demand (OCFD). OCF; is equal to amortization and depreciation charges, profit before interest and tax, change in operating capital and sum of many non-strategic investments. OCFD represents capital cost. The OCFD is calculated for each strategic investment and includes the initial cost of investment, economic life, weighted average cost of capital. The OCFD is the sum of the present values of the cash flows that equalize the initial cost of a strategic investment (Ottoson and Weissenrieder, 1996).

Formulas that produce different but similar results for the CVA and that are based primarily on CFROI applications can also do calculations. OCFD is also achieved by adding OCF, amortization (ASF) of under skilled funds (cost of non-yielding investments) and Cost of Invested Capital (COIC) by adding amortization and depreciation expenses (ADE) to NOPAT. Then, CVA value is obtained from the difference between OCF and OCFD (Martin and Petty, 2000: 128). If we express this situation mathematically;

$$CVA = (NOPAT + ADE) - (ASF + COIC)$$

Young and O'byrne (2001) consider CVA value as a surplus profit and recommend that NOPAT is be calculated taking into consideration cash-based capital elements. In this approach, changes in NOPAT, ADE and long-term liabilities (LTL) as OCF; the cost of capital invested as OCFD is accepted and the CVA is calculated as the difference between these two values. According to this;

$$CVA = (NOPAT + ADE + \Delta LTL) - (COICxWACC)$$

It can also be written as ΔLTL; It shows long-term liabilities exchange and (COIC x WACC); The cost of the invested capital in here. Finally, one of the most prevalent value-based financial measures is CFROI. The criterion measures the expected proceeds of an investment, taking into account the cash flows and the time value of money. The theoretical structure of CFROI is based on the conversion of post-tax inflation adjusted cash flows (Profit Before Interest and Tax + Current Year Depreciation) and inflation-adjusted gross cash investment (Net Asset + Accumulated Depreciation of Fixed Assets) to internal rate of proceeds O'Byrne 2001; Ameels, Bruggeman and Schipers 2002). CFROI is an activity criterion that compares the cash flows generated by a given period with the total assets required to generate the cash flow at the same time (Damodaran, 1999: Erasmus 2008). The mathematical expression for calculating CFROI by the internal rate method is as follows (Ameels, Bruggeman and Schipers 2002):

$$GCI = \sum_{t=1}^{n} \frac{GCF_t}{(1 + r)^n} + \frac{TV_{n+1}}{(1 + r)^{n+1}}$$

Here GCI: gross cash investment, GCF: gross cash flow, TV; Terminal Value and t: years. TV; The value of the assets of the company that are not subject to depreciation (such as land and buildings) at the end of the economic life. Another calculation is performed considering the economic depreciation (ED). Economic depreciation can be calculated as follows (Görke, 2011: 32);

$$ED = \frac{WACC}{(1 + WACC)^n - 1} \times \text{Depreciable Assets}$$

After the economic depreciation, CFROI can be calculated as follows (Damadoran; Chandra, 2011);

$$CFROI = \frac{GCF - ED}{GCI}$$

CFROI is calculated by dividing the gross cash investment value to found value taking the difference between gross cash flow and economic depreciation.

3. Literature Review

It is seen that the field studies intensively on how many investment instruments are required in an optimal portfolio or a well-diversified portfolio (Kapusuzoğlu and İbicioğlu, 2013). In addition to this, one of the most discussed topics is the criteria for the selection of share certificates to be included in portfolios. It is seen in literature that many different methods are used to select the share certificates to be included in the portfolio or to form a portfolio. The main purpose of these methods is to maximize the proceeds of the portfolio that the investor will have according to these methods. In the literature below, the main methods used for stock selection and major studies are given.

Ecer, Vurur and Özdemir (2009) created optimal portfolios with the fuzzy TOPSIS model using the financial ratios calculated from the balances published in 2006 of 10 firms in the listed cement sector. As a result of the study, firms are ranked according to their proximity coefficients and it is stated that the fuzzy TOPSIS model can be used to construct an optimal portfolio. A similar study was conducted by Guo et al. (2016) under the assumption of different investment scenarios of stocks. A portfolio selection model with fuzzy logic has been developed considering the many periods in the study and this model has been analyzed by including transaction costs. In this study, stock derivatives are used as fuzzy variables and models are proposed with the help of genetic algorithm. It was reached the result of that a rational investor can create an optimal investment strategy with recommended model. Şahin and Akkaya (2014) used Promethee, a very criteria-based decision-making technique, in the selection of preferred stocks while forming a portfolio in the study they conducted. As a result of the study, the share certificates that should be included in the portfolio in terms of dividend, transaction amount, volatility and transaction volume criteria were determined and it was stated that Promethee ranking method is a solution tool for portfolio creation.

İşler et al. (2009) estimated the stocks to be placed in the portfolio through price movements in their studies on portfolio management and decision support system in stock selection. The stock exchange as a session was evaluated by developing a deduction mechanism for decision support system and positions of stocks were evaluated. A similar decision support system was also implemented by Çetinyokuş and Gökçen (2002) using technical analysis criteria.

Uğurlu, Erdas and Eroğlu (2015) stated that the number of stocks to be selected in the study makes it difficult to calculate the standard deviation of the number of shares. In this point, it is stated that portfolio selection can be expressed as a linear programming model by using absolute deviation instead of standard deviation as the risk measure. In this context, a new linear programming model proposal providing the highest expected proceeds to the investor is being made.

Kardiyen (2008) has dealt with the mean-variance model and the mean-absolute deviation model for optimal portfolio generation. Portfolios were created with the application of two models for different target return levels by using monthly proceeds values. The main result obtained in the study is the portfolio selection with the mean-absolute deviation model. A similar study was conducted by Demirtaş and Güngör (2004). It is emphasized that the basic and technical analysis methods are not very effective methods because the transaction volume and transaction volume in the stock exchange are low in the study. In the study, it was emphasized that computer aided programs should be used to take into consideration the risk values of the investor in the market. It has been stated that different iterations can be obtained with these programs and alternate portfolio diversification can be done.

Kaya and Kocadağlı (2012) determined optimal portfolios by using closing prices of stocks traded in BIST30 for September 2011 - October 2011 in their study on effective border and beta-constrained portfolio selection. As a result of the analysis of which stocks are to be included in the portfolio under Within the scope of Markowitz (1952), Sharpe (1964) and Konno and Yamazaki (1991) models, it was concluded as possible that the investor who makes the portfolio selection considering the tendency of the market and effective portfolio may make a profit when a conservative investor who targets an average proceeds may make a loss, as a result of the analyzes regarding which stocks will be taken as a portfolio.

Under the uncertainty of Ding (2006), the decision-making process at the minimum and maximum uncertainty points was analyzed by taking into consideration the stocks with different risk-proceeds ratios in the study conducted by risky portfolios. Linear programming model developed by the author, Markowitz's average variance model and Young's minmax model were compared.

Lower risk portfolios that have the same proceeds as the BIST30 index are created using Abay (2013) the quadratic programming model. In the study, it was determined which share certificates would be included in the portfolio in which proportion calculating the risk and proceeds ratios while creating a portfolio. The study showed that portfolio selection models with complex mathematical background can be solved quickly and efficiently using programs. Xu et al. (2016) conducted an analysis on the Shanghai and Shenzhen 300 and Shanghai Stock Exchange Composite markets using the conditional value at risk (CVAR) method in the selection of large scale portfolios at the quadratic programming point. As a result of the study, it was understood that it was effective in managing large-scale portfolios compared to traditional methods and that it was performing well against the risk of carrying the portfolio formed with small scale and small amount of financial assets.

In the study that compared the EVA and Markowitz-Average variance model as the voluntary (2008) portfolio selection model, two basic portfolios were formed considering the shares of the companies traded between 2003-2007. Among these two portfolios; expected proceeds, variance and performance were compared. As a result of these comparisons, different methods have been found to be successful at different rates of proceeds.

Maitah et al. (2015) analyzed the relationship between EVA values and prices of stocks traded in the Egyptian stock market. The benefits that was compared to the average market returns of portfolios consisting of high EVA-rated stocks and that was created by the investment policy was measured in the study. As a result, stocks with high EVA values have not always achieved high proceeds.

Awan, Siddique and Sarwar (2014) stated that EVA's effect on stock proceeds and its use in stock selection can be used in the study of 59 companies between 2006 and 2010 on the Pakistan stock exchange. Noravesh and Heidari (2005) pointed out that there is a relationship between the CVA and the annual stock offerings at the Tehran Stock Exchange, and it has been achieved the result that companies with high CVA values can take the portfolio based on this relationship.

Cary et al. (2004) used the Portfolio Separability Test in the study they conducted by taking the MVA criterion as to which stocks were to be selected for portfolio formation. 919 companies traded in the US 1000 index were included in the analysis process between 1990 and 1999. As a result of this study, we conclude that the cumulative proceeds of portfolios constructed according to MVA measures are higher than others.

4. Methodology and Data Set of the Study

4.1. Methodology of the Study

The main purpose of the study is; To calculate the performance of industrial enterprises traded in BIST according to value-based measures using the data of the last 5 years (including 2010-2014), to create high yield portfolios taking into consideration the enterprises that provide the best results. The success of these findings in portfolio formation has been examined by comparing it with index returns obtaining the findings that will guide the investor with the created portfolio. In this context, Figure-1 shows the research model.
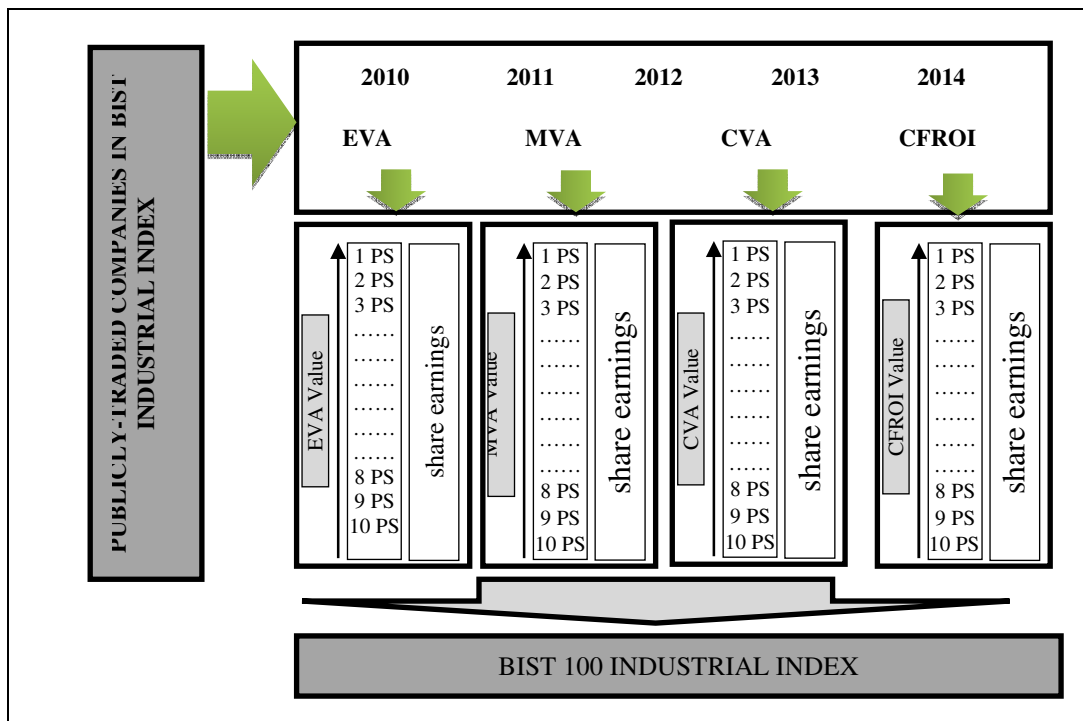
Figure 1: Model of the Study

The performance values of the companies included in the BIST 100 industrial index were calculated providing each criterion on a yearly basis like EVA, MVA, CVA and CFROI in this context and according to this, portfolios were created taking into consideration the first 10 shares giving the highest value (Assuming 10 shares in each portfolio). In other words, share certificates giving the best performance in terms of value-based measures that year was taken into portfolio with equal weights. The average proceeds of shares are calculated for each portfolio generated. This analysis made on a yearly basis was finally replicated taking into consideration the average of the survey period.

4.2. Data Structure and Analysis of the Study

The main body of the study; is limited with 82 companies which is situated in the Istanbul Stock Exchange index. The reason for the selection of the Istanbul Stock Exchange index as the main body; mentioned index is composed of the stocks that have high sector representation ability and high transaction volume among those with high market value and high liquidity.Four groups of data were used in the study.

These are; (i) balance sheets, income statements, annual reports, amortization table, statement of changes in equity, cash flow statements of the mentioned companies (ii) the EVA, MVA, CVA and CFRIO values that are calculated using these (iii) annual changes in the share price of the companies under investigation (iv) annual compound interest rates of treasury bills between 2010 and 2014, which will be used as risk-free interest rates, the issued capital amounts of the BIST INDUSTRIAL which belongs to the research period, Beta values of share certificates the BIST INDUSTRIAL which belongs to the research period, credit default swap values that belongs to the research period, and The advance loan rates used in the interbank markets by the Central Bank that belongs to the research period. The formulas used in the calculations of the variables included in the survey are shown in Table 1 below.

Variables	Formulas
EVA	NOPAT-(WACC x TIC)
MVA	Total Market Value – Total Invested Capital
CVA	$(NOPAT + ADE + \Delta LTL) - (COIC \times WACC)$
CFROI	(GCF-ED)/GCI
Stock Return *	$(P_t - P_{t-1})/P_{t-1}$
*P_t; Stock exchange value in period t, P_{t-1}: Stock exchange value in period t-1	

Table 1: Formulas that are used in the Study

Dividend income has been included when calculating the share of share certificates. It is assumed that the investment ratio of all share certificates in the portfolio is 10%. In the study, the capital assets pricing model (CAPM) model was used to calculate the cost of equity, especially for WACC values. The interest rate on the quarterly treasury bills was used as the risk-free interest rate. Gross cash flows; are gained by sum profit before interest and taxes and current year depreciation. In addition, the gross investment amount was found by adding the accumulated depreciation of fixed assets to the net asset value.

Year	Average EVA	Average MVA	Average CVA	Average CFROI (%)	Average Share Price	Average WACC (%)
2010	14.233.687	3.181.225	635.045.000	26,46	3,50	33,98
2011	-63.050.538	-204.347.662	1.034.953.189	26,46	3,49	34,43
2012	26.857.268	15.356.892	157.738.661	26,55	4,51	33,65
2013	27.002.525	-35.577.721	80.806.263	26,71	4,12	33,75
2014	1.226.041.157	331.455.062	363.142.253	26,55	5,98	33,53
Average	**246.216.820**	**22.013.559**	**454.337.073**	**27**	**4,32**	**34**

Table 2: Average Values of Variables by Years

When the values in Table 2 are examined, it can be seen that EVA values of the surveyed companies have positive values in years and only negative values in 2011. The average EVA value between 2010 and 2014 is 246.216.820 TL A similar result was happened in MVA and negative values was gotten in 2011. The average MVA value was realized as 22.013.559 TL. When the CVA values are examined, it is seen that the average value of the research period is 454.337.073 TL and fluctuates by years. The average CFROI value is 27%, whereas the average WACC is around 34%. The average price of shares traded on the market is 4,32 TL[1].

4.3. Empirical Results of the Study
The empirical results of the study is given in the tables below. Over the course of the research period, the value-based performance measures for each year and the stocks listed in the industrial index are listed and the results of the portfolio are given. Table 3 shows the stock proceeds of the portfolios created according to the EVA values for the period 2010-2014 and the average proceeds of the index. According to the portfolio generated in the stocks with the highest value according to EVA in 2010, it is seen as 89.49% when compared to the portfolio (PART A). On the other hand, if the investor invests not in the portfolio created by EVA values, but invests in the index, the proceeds will be 66.63% (PART B).

PART A								
2010			**2011**			**2012**		
Firms	**EVA**	**Stock Return**	**Firms**	**EVA**	**Stock Return**	**Firms**	**EVA**	**Stock Return**
GUBRF	218.403.673	1,151	GUBRF	311.258.532	-0,485	GUBRF	368.431.742	0,822
GOODY	25.494.144	0,768	TTRAK	264.991.267	0,629	TTRAK	249.088.548	0,575
TTRAK	170.434.607	1,521	ULKER	540.351.262	-0,026	FROTO	472.468.697	0,314
PNSUT	54.332.240	1,078	ADEL	23.988.084	0,730	ADEL	22.881.986	0,100
MRDIN	69.195.398	0,269	MRDIN	72.197.989	-0,143	PNSUT	47.528.356	0,633
KONYA	31.791.476	2,234	SODA	155.204.115	0,443	CCOLA	3.319.158.830	0,089
PETUN	31.644.716	0,638	KNFRT	7.496.838.404	0,277	BFREN	18.034.855	0,121
ULKER	147.799.980	0,561	KONYA	33.942.835	0,356	KONYA	33.236.895	0,584
CIMSA	75.262.650	0,391	KORDS	92.540.442	-0,049	AKCNS	91.310.009	2,236
ARCLK	3.260.870.096	0,338	GOODY	42.486.250	1,055	TOASO	3.611.950.949	0,822
Portfolio Return		**%89,49**	**Portfolio Return**		**%27,88**	**Portfolio Return**		**%57,05**

PART A						PART B	
2013			**2014**				
Firms	**EVA**	**Stock Return**	**Firms**	**EVA**	**Stock Return**	**BIST 100 INDUSTRIAL INDEX RETURN**	**%**
GUBRF	290.947.104	-0,211	TTRAK	231.016.699	0,475	**2010**	**66,63**
TTRAK	250.468.089	0,141	ADEL	27.847.347	0,269	**2011**	**3,66**
ADEL	43.239.140	0,035	CIMSA	196.965.226	0,397	**2012**	**6,42**
CCOLA	6.184.724.146	0,341	DERIM	7.444.048.214	-0,206	**2013**	**24,23**
AKCNS	125.244.698	0,081	AKCNS	214.965.648	0,465	**2014**	**-2,80**
DERIM	7.323.396.524	0,762	PNSUT	63.328.374	0,414	**Average**	**19,63**
FROTO	330.943.247	1,323	GUBRF	33.133.708	0,903		
CIMSA	246.973.261	0,231	CCOLA	4.603.546.537	0,027	**PORTFOLIO AVERAGES OF ALL YEARS ACCORDING TO EVA**	**%47,73**
PNSUT	44.486.065	0,212	NUHCM	165.227.283	0,268		
ALCAR	25.000.277	0,2827	KONYA	56.705.341	0,2613		
Portfolio Return		**%34,49**	**Portfolio Return**		**%32,76**		

Table 3: Proceeds of Index and Proceeds of Stocks that belong to Portfolio created according to the highest EVA values

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[1]TL: Turkish Lira is a Turkish currency

Similarly, it has been realized that when we look at the year 2011, while the return of the portfolio formed by EVA values was 27.88%, the index proceeds was 3.66%, while the proceeds of the portfolio created with EVA values in 2012 was 57.05%, the proceeds of the index is 6.42%, the portfolio generated by EVA values in 2013 was 34,49%, the proceeds of the index is 24.23% per annum and finally the portfolio generated by EVA values in 2014 was 32.76%, the proceeds of the index is 2.80% per annum.

As can be seen, the proceeds of portfolios created by taking EVA values into account was higher than the indexed proceeds for each period during the research period. The average index revenues in the study period were 19.63%, while the portfolio averages for all years were 47.73% according to EVA. Portfolio yields obtained in 2011, 2013 and 2014 are below 47.73%, which is portfolio averages of all years according to EVA.

Table 4 shows the stock proceeds and the average proceeds of the index for the portfolios created according to the MVA values for the period 2010-2014.

PART A								
2010			**2011**			**2012**		
Firms	**MVA**	**Stock Return**	**Firms**	**MVA**	**Stock Return**	**Firms**	**MVA**	**Stock Return**
GENTS	4.904.522.492	0,750	BFREN	4.614.304.304	-0,016	BFREN	5.000.117.253	0,089
BFREN	4.691.916.084	1,018	AFYON	1.414.124.229	-0,484	ULKER	2.172.666.588	1,127
AFYON	1.187.908.165	1,702	KONYA	969.445.586	0,356	TTRAK	1.806.127.223	0,822
NUHCM	655.415.219	0,044	GENTS	830.893.439	0,285	KONYA	1.167.226.433	0,121
KONYA	628.727.997	2,234	ALCAR	791.122.139	0,820	AFYON	1.035.795.818	-0,224
AKCNS	393.697.549	0,149	TTRAK	759.446.428	0,629	AKCNS	972.134.231	0,584
MRDIN	374.361.386	0,269	IZMDC	618.116.519	2,014	IZMDC	911.742.840	-0,004
TTRAK	363.318.107	1,521	NUHCM	560.943.973	-0,043	BRISA	873.551.701	0,460
CIMSA	362.969.518	0,391	AKCNS	360.687.622	-0,071	GENTS	825.466.442	0,555
TATGD	351.594.845	0,414	KARTN	331.387.934	-0,075	NUHCM	611.385.352	0,047
Portfolio Return		**%84,92**	**Portfolio Return**		**%34,16**	**Portfolio Return**		**%35,80**
PART A						PART B		
2013			**2014**					
Firms	**MVA**	**Stock Return**	**Firms**	**MVA**	**Stock Return**	**BIST 100 INDUSTRIAL INDEX RETURN**		**%**
BFREN	4.181.493.243	-0,142	EREGL	5.299.693.000	1,133		2010	66,63
ULKER	3.530.091.553	0,580	ULKER	5.025.211.307	0,303		2011	3,66
TTRAK	2.075.099.168	0,141	BFREN	4.491.495.111	0,075		2012	6,42
GENTS	1.913.662.902	0,041	TTRAK	3.452.582.385	0,475		2013	24,23
AKCNS	1.136.443.731	0,179	GENTS	2.881.103.930	0,465		2014	-2,80
BRISA	1.091.369.299	0,217	MRDIN	2.711.765.064	0,186		**Average**	19,63
AFYON	876.545.243	0,260	ADEL	2.560.905.767	0,171	**PORTFOLIO AVERAGES OF ALL YEARS ACCORDING TO MVA**		**%42,83**
KONYA	732.396.150	-0,291	BRISA	2.403.574.769	0,812			
CIMSA	428.301.995	0,231	AKCNS	1.788.548.662	0,465			
UNYEC	369.232.506	0,141	KRDMA	1.290.515.143	0,530			
Portfolio Return		**%13,57**	**Portfolio Return**		**%46,20**			

Table 4: Proceeds of Index and Proceeds of Stocks that belong to Portfolio created according to the highest MVA values

According to this, while the results of the portfolios formed according to the highest MVA values for the years, is realized respectively as 84.92% in 2010, 34.16% in 2011, 35,80% in 2012, 13.57% in 2013 and 46.20% in 2014, proceeds of indexes is realized respectively as 66.63% in 2010, 3.66% in 2011, 6.42% in 2012, 24.23% in 2013 and -2.80 in 2014. As you can see, proceeds of portfolios created according to MVA values are realized over the proceeds of index excluding the year 2013. It can be said that Two of the shares received in the portfolio in 2013 (BFREN and KONYA) have fallen below the index proceeds because of the fact that they have a negative proceeds and other stocks are not high proceeds. However, during the research period, while proceeds of index realized as average 19.63%, proceeds of the portfolio averages of all years are realized as 42,83% with 23.2 points difference according to MVA. Therefore, it can be said that the proceeds of the portfolios established by considering the MVA values is generally higher than the proceeds obtained according to indices during the research period. Table 5 shows the stock proceeds and the average proceeds of the index for the portfolios created according to the CVA values for the period 2010-2014.

PART A								
2010			**2011**			**2012**		
Firms	**CVA**	**Stock Return**	**Firms**	**CVA**	**Stock Return**	**Firms**	**CVA**	**Stock Return**
SKTAS	38.714.459.514	1,348	EREGL	90.455.422.102	-0,055	EREGL	9.138.749.094	0,301
EREGL	17.080.529.204	0,177	AKCNS	2.073.173.966	-0,071	KRDMA	1.983.608.653	0,646
YUNSA	2.100.476.290	0,831	GUBRF	1.694.856.190	-0,485	AKCNS	1.948.939.249	0,584
AKCNS	1.954.532.596	0,149	CIMSA	1.567.762.900	-0,183	CIMSA	1.798.151.339	0,245
CIMSA	1.546.512.406	0,391	NUHCM	1.419.283.128	-0,043	NUHCM	1.604.097.021	0,047
NUHCM	1.391.562.146	0,044	GOODY	967.592.380	1,055	BRISA	1.511.571.985	0,460
GOODY	953.458.464	0,768	TTRAK	746.804.869	0,629	HURGZ	1.266.866.885	0,319
GOLTS	878.521.202	0,659	TATGD	665.068.991	-0,579	GOODY	1.015.629.257	0,576
TTRAK	767.711.248	1,521	KONYA	570.213.248	0,356	GOLTS	921.997.927	0,255
PNSUT	548.771.174	1,078	KARTN	492.258.557	-0,075	TTRAK	916.022.401	0,822
Portfolio Return		**%69,66**	**Portfolio Return**		**%5,48**	**Portfolio Return**		**%42,60**

Table 5 continue

PART A						PART B		
2013			**2014**					
Firms	**CVA**	**Stock Return**	**Firms**	**CVA**	**Stock Return**	**BIST 100 INDUSTRIAL INDEX RETURN**		**%**
SODA	2.051.734.778	0,065	KRDMA	2.891.910.519	0,530		2010	66,63
CIMSA	1.965.158.218	0,231	CIMSA	2.887.043.991	0,397		2011	3,66
EREGL	1.934.184.898	-0,050	SODA	2.503.609.409	0,881		2012	6,42
BRISA	1.912.961.269	0,217	EREGL	2.144.504.400	1,133		2013	24,23
HURGZ	1.715.494.994	-0,326	GUBRF	1.897.224.126	0,903		2014	-2,80
NUHCM	1.639.162.054	-0,043	NUHCM	1.731.168.862	0,268		**Average**	19,63
GUBRF	1.509.342.052	-0,211	TTRAK	1.198.121.624	0,475	**PORTFOLIO AVERAGES OF ALL YEARS ACCORDING TO CVA**		**%36,22**
AKCNS	1.373.927.338	0,179	GOLTS	974.644.586	0,368			
TTRAK	1.083.011.397	0,141	GOODY	959.337.465	0,916			
GOODY	1.056.426.563	-0,254	AKCNS	930.598.626	0,465			
Portfolio Return		**-%0,05**	**Portfolio Return**		**%63,40**			

Table 5: Proceeds of Index and Proceeds of Stocks that belong to Portfolio created according to the highest CVA values

As can be seen from Table 5, it is obvious that fluctuations in the years when the inventories of the portfolios created according to CVA values are examined. Especially the portfolios created in this way are very low for 2011 and 2013. In addition, portfolio turnover index for 2013 is quite below the index turnover. In 2014, the portfolio generated according to the CVA values was significantly higher than the negative index proceeds. In 2010, the index proceeds (66,63%) and the portfolio created by CVA values are very close to each other (69,66%). A similar situation can be said in 2011. It is seen that in every two years, a higher portfolio proceeds are obtained compared to the index in general. In 2012, the proceeds on portfolio created by CVA values (42,60%) was considerably higher than the index proceeds in 2010 and 2011. As a result, according to the CVA, the portfolio averages for all years are realized as 36,22% while the index average for the research period is 19,63%. When a portfolio is constructed according to the CVA, it can be said that the proceeds of this portfolio can be obtained approximately 50% higher than the average proceeds of the index.

Table 6 shows the stock proceeds and the average proceed of the index of the portfolios created according to the CFROI values as of the period of 2010-2014.

PART A								
2010			**2011**			**2012**		
Firms	**CFROI**	**Stock Return**	**Firms**	**CFROI**	**Stock Return**	**Firms**	**CFROI**	**Stock Return**
DGKLB	0.4915	0,543	BFREN	0.6747	-0,016	BFREN	0.6466	0,089
FROTO	0.4368	0,482	ULKER	0.4827	-0,026	GUBRF	0.3931	0,226
MRDIN	0.3093	0,269	TTRAK	0.3653	0,629	TTRAK	0.3210	0,822
TTRAK	0.2760	1,521	MRDIN	0.3086	-0,143	ALCAR	0.2709	0,370
GUBRF	0.2584	1,151	COMDO	0.2853	0,330	DURDO	0.2574	1,264
HEKTS	0.2158	0,784	FROTO	0.2584	0,297	HEKTS	0.2119	0,705
ALCAR	0.2062	0,533	GUBRF	0.2533	-0,485	CCOLA	0.1995	0,633
ADEL	0.1828	1,343	ALCAR	0.2062	0,820	FROTO	0.1952	1,642
ADANA	0.1800	1,042	PNSUT	0.2060	0,235	DYOBY	0.1941	0,470
BFREN	0.1741	1,018	ADEL	0.1975	0,730	HURGZ	0.1910	0,319
Portfolio Return	**% 86,86**		**Portfolio Return**	**%23,71**		**Portfolio Return**		**%65,45**

PART A						PART B	
2013			**2014**				
Firms	**CFROI**	**Stock Return**	**Firms**	**CFROI**	**Stock Return**	**BIST 100 INDUSTRIAL INDEX RETURN**	**%**
DYOBY	0.4934	-0,048	SARKY	0.6608	0,196	2010	66,63
GUBRF	0.4304	-0,211	ADEL	0.3787	0,171	2011	3,66
AKCNS	0.3822	0,179	DYBYO	0.3787	0,848	2012	6,42
ALCAR	0.3694	-0,282	MERKO	0.3563	0,444	2013	24,23
CIMSA	0.3517	0,231	ADANA	0.3032	0,620	2014	-2,80
TTRAK	0.3002	0,141	TTRAK	0.2879	0,475	**Average**	19,63
COMDO	0.2775	-0,345	GUBRF	0.2718	0,903	**PORTFOLIO AVERAGES OF ALL YEARS ACCORDING TO CFROI**	**%45,74**
ADEL	0.2747	0,187	HEKTS	0.2430	0,607		
DERIM	0.2601	0,762	DERIM	0.2378	-0,206		
CCOLA	0.2357	0,341	COMDO	0.2194	0,253		
Portfolio Return	**%9,54**		**Portfolio Return**	**%43,15**			

Table 6: Proceeds of Index and Proceeds of Stocks that belong to Portfolio created according to the highest CFROI values

As seen in Table 6, the highest proceed from portfolios created according to CFROI values in the research period is observed in 2010, whereas the lowest return is observed in 2013. While the proceed rate of the portfolio constructed according to CFROI values was 86.86% in 2010, the rate of proceed of the index was about 66.63%, down by about 20 points. A similar situation is seen in 2011 as well. In this year, the proceed rate of the portfolio based on CFROI values is higher than the index proceed rate. This situation is similar in 2012 and 2014. However, the proceed ratios of portfolios that were created according to CFROI values in these years were at least 45 pounds higher than the index return rates. In 2013, the portfolio created according to CFROI values is below the proceed of the index. According to CFROI, portfolio averages for all years are 45,74% while the average proceed of the index is 19,63%. Table 7 shows the comparison of the criterions in creating portfolio proceed.

Portfolio Averages of All Years According to EVA	%47,73	THE AVERAGE BIST 100 INDUSTRIAL INDEX RETURNS	%19,63
Portfolio Averages of All Years According to CFROI	%45,74		
Portfolio Averages of All Years According to MVA	%42,83		
Portfolio Averages of All Years According to CVA	%36,22		

Table 7: Comparison of Value-Based Measures According to Indices and Index Proceed

Table 7 shows which value-based performance criterion or criterions can be used at the decision-making point for the selection of shares to be placed in the portfolio. In this context, it is seen that all portfolios constructed with value-based measures have higher proceed ratios. As a result, it can be said that the portfolios to be formed considering the EVA criterion can bring more proceeds than others. In other words, if a single criterion is to be used, it is suggested that the EVA criterion should be used first in the four value-based performance criterions, CFROI criterion follows this criterion. The last criterion that can be taken into consideration is the CVA criterion. In other respects, it can be expressed that portfolio creation according to EVA, CFROI and MVA criterions may be one step ahead of portfolio creation compared to CVA criterion.

5. Conclusion

Investors from the past to today, have adopted the basic goals like to get a proceed on investments as a principle. Investors who have accepted these principles as an important goal; have developed portfolio management models with the aim of adapting to the increasing competition and the changing conditions, at the same time to increase the proceeds by minimizing the risk. In changing conditions, the aim of obtaining proceeds have become the basis of value-based management by integrating the aim of value creation.

Portfolio management is undoubtedly one of the most important issues that investors are most interested in. There are portfolio management models like capital asset pricing model, arbitrage pricing model, single index model, random analysis, basic analysis, and technical analysis between developed portfolio management models. At this point, value-based criterions have come to the fore as an alternative to portfolio management models with changing circumstances lead investors to value based management, and the idea that these criterions can be used in portfolio formation.

In this study, portfolios were created with economic value added, market value added, cash value added and investment cash flow profitability from value-based management criteria. The relationship between EVA and share price was directly explained, however, the EVA criterion was not used much in the selection of share certificates. However, MVA is often used as a bridge in portfolio formation. In this study, EVA, MVA, CVA and CFRIO values of the companies included in the BIST SINAI index companies were examined in terms of 5-year periods (2010-2014), portfolios were created for each year with share certificates giving the highest values. It is observed that the portfolios formed by these criteria provide a relatively higher proceed than the BIST INDEX. The highest rate of proceed is derived from portfolios constructed according to the EVA criterion. This is followed by CFROI, MVA and finally CVA criterion.

As an alternative to the traditional portfolio models, by doing analysis with value based criteria for later periods, they may can comment on share price. As a result, using value-based measures in their analysis, and building portfolios using these criteria will be beneficial for investors in valuing their investments and proceeds. However, there are a few basic limitations that should be known in this study. The most important of these is the difficulty in calculating the value-based financial measures calculated in the work. Miscalculation of these criteria, which are highly sensitive to incorrect calculations, will affect the results. Accordingly, since the calculation of the criteria requires expertise and includes many assumptions, it cannot be used very easily by certain investors and its use is limited. Finally, the risks of the portfolio are not calculated in this study. Only comparisons of the portfolio proceeds with the proceeds of the indexes have been made. When different portfolio management models are applied, the portfolios created according to them should also be considered for their risks.

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