

The Comprehensive and Fundamental Analysis of the Application of Economic Value Added (EVA) in Tehran Stock Exchange)

El análisis integral y fundamental de la aplicación del valor agregado económico (EVA) en la Bolsa de Teherán)

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Abstract

Economic value added (EVA) as a measure of performance is very useful. Calculation shows how and where a company creates wealth and value through the introduction of balance sheet items using this method. This will make managers aware of assets and costs when making managerial decisions. However, the calculation of economic value added strongly emphasizes the amount of investment capital and should be used for companies with stable or capitalized capital assets. The use of the Economic Value Added technique in companies with intangible assets such as technology companies and knowledge base may not be desirable.

The present research objective is the fundamental analysis and application of Economic Value Added (EVA) in Tehran Stock Exchange.

The result of the study illustrate that In model 1, EVA calculated by using dividend discount model (DDM) and In model 2, EVA calculated by using Capital Asset Pricing Model (CAPM.). The results show that average of EVA of listed companies of TSE in model 1 during 2005-2009 were -6931 and negative.

The result of the study demonstrate that In model 2, EVA calculated by using WACC with CAPM model, average of EVA of listed companies of TSE in 2005-2009 periods were 80035 positive.

Keywords: Value Added, Economic Value Added (EVA), Tehran Stock Exchange (TSE)

Resumen

El valor agregado económico (EVA) como medida del desempeño es muy útil. El cálculo muestra cómo y dónde una empresa crea riqueza y valor mediante la introducción de partidas del balance utilizando este método. Esto hará que los gerentes sean conscientes de los activos y costos al tomar decisiones gerenciales. Sin embargo, el cálculo del valor económico agregado enfatiza fuertemente la cantidad de capital de inversión y debe usarse para empresas con activos de capital estables o capitalizados. El uso de la técnica de Valor Económico Agregado en compañías con activos intangibles como compañías de tecnología y base de conocimiento puede no ser deseable.

El presente objetivo de investigación es el análisis fundamental y la aplicación del Valor Económico Agregado (EVA) en la Bolsa de Teherán.

El resultado del estudio ilustra que en el modelo 1, EVA se calculó usando el modelo de descuento de dividendos (DDM) y en el modelo 2, EVA se calculó usando el Modelo de fijación de precios de activos de capital (CAPM). Los resultados muestran que el promedio de EVA de las compañías cotizadas de TSE en el modelo 1 durante 2005-2009 fue -6931 y negativo.

El resultado del estudio demuestra que en el modelo 2, el EVA calculado mediante el uso de WACC con el modelo CAPM, el promedio de EVA de las compañías cotizadas de TSE en los períodos 2005-2009 fue 80035 positivo.

Palabras clave: valor agregado, valor agregado económico (EVA), bolsa de valores de Teherán (TSE)

Introduction

Economic Value Added (EVA) is a practical method of estimating the economic profit that is earned, as against accounting profit. This way of looking at financials enables companies to truly understand if they are profitable because they manage assets (taub, 2003). Proponents of EVA provided evidence to establish this method as a superior performance measurement and incentive compensation system and claimed that it is really better to use EVA than traditional accounting performance measures such as Earnings Per Share (EPS), Return On Investment (ROI), and Return on Equity (ROE) (Stewart, 1991; Tully 1993; Stern et al., 1995; Ehrbar, 1998).

One of the major drawbacks of the ROA is that it uses net accounting profit. Net profit itself has many uncertainties, such as the possibility of smoothing the profits by the corporate management that will manipulate the profits by the management to earn more rewards. Optional use of management is to use accounting methods accepted. Of course, there are also benefits such as ease of calculation, low cost and easy to understand.

Now, given the aforementioned deficiencies in the rate of Return on Assets (ROA), the Economic Value Added (EVA) has partially eliminated these deficiencies and made up for the shortcomings. For example, in calculating the economic value added (EVA), net profit is no longer used in the statement of comprehensive income but is used after tax deduction (NOPAT) to resolve some issues on its own.

Different groups have special attention to the issue of evaluating participants' performance for various reasons, and they consider them important, including owners, managers, government investors, banks and creditors. There are also different criteria for performance evaluation, each of which can be the appropriate benchmark for performance evaluation. The information required for these criteria is obtained through financial statements (accounting), economics, free markets or a combination of them, each of which has somewhat different advantages and disadvantages.

Modanlo Joibary and Nagaraja (2012) examined the relationships between economic value added (EVA) and Traditional Accounting Measures of Companies listed in Bangalore Stock Exchange (BgSE). The dependent variable of this study was EVA and independent variables were ROE, ROA, ROI and EPS.

The result of research hypotheses analysis showed that there are significant relationship between EVA and dividend (DPS); EVA and Net Operating Profits after Taxes (NOPAT); and EVA

and share price (P). The results indicated 5 % changing in share price (P), 81.6 % changing in Net Operating Profits after Taxes (NOPAT), and 20.9 % changing in dividend (DPS) can predict Economic Value Added (EVA). This study shows that Net Operating Profits after Taxes (NOPAT) with regression coefficient 0.904 have stronger relationship with EVA than P and DPS.

Sakthivel (2011) analyzed the value creation in Indian Pharmaceutical Industry from 1997-98 to 2006-07 by using regression analysis .it was found that the companies with high level of EVA were very highly valued and differ from valuation of companies with low and moderate EVA groups. So, it was clear that there is significant association between MVA and EVA for companies under pharmaceutical industry. It was strongly concluded that there is significant difference in mean value creation across low, moderate and high total productivity for pharmaceutical companies. In regression analysis, it was found that total productivity did not have explanatory power on value creation in short-term, but it had some influence on value creation in the long-run in respect of pharmaceutical companies. It was found that EVA was only variable which has unique influence on MVA of Pharmaceutical companies. Hence, it was concluded that Economic value added had positive significant impact on Value Creation for Pharmaceutical companies.

Pantea, Ioan, V Munteanu, Gligor, and Sopoian (2011) represented that measured trough Economic Value Added (EVA) the performances of the firm were dependent on the strategies, which are applied by managers. The goal of this study was to provide a pertinent measure of managerial performances, starting from the idea that those were real only when they assured the satisfaction of all groups, which were interested in the good evolution of the firm. The performances of a firm came from the operating activities, which has to generate big enough cash flow to accomplish the satisfactory remuneration of the creditors, to overcome all the taxes imposed by the state and to lead to the growth of the shareholders' wealth.

The thesis of Bin (2010) aimed at the malpractice existing in traditional accounting method (putting emphasis on net profit and return on investment) and used Economic Value Added (EVA) Evaluation Method to evaluate thermal power enterprises' performance. This article established EVA index system for thermal power enterprise, and made a contrast analysis by applying these two methods into some financial data of certain thermal power listed company. It showed EVA can reflect more effectively how power plant operated than traditional way. It encouraged managers to control the production and operation



costs more strictly, make reasonable investment, thereby EVA method could enhance thermal power enterprise operating Efficiency and improve capital returns.

Definition of Economic Value Added (EVA)

The economic value added is, in fact, the estimate of the real economic benefit of a company in one year and represents the remainder of the gain after deducting the cost of capital. Earning economic value by reducing the opportunity cost of equity is derived from net profit, so it is a measure that takes into account the opportunity cost of all resources used by the company. Economic value added is a benchmark for measuring the ability of management to increase performance and value added. It should be noted that economic value added can be applied both to the whole company and to different parts of a company; therefore, it provides a basis for determining the performance of management at all levels.

The economic value added as an evaluation criterion takes into account the opportunity cost of equity holders and the time value of money and distorts the application of accounting principles. The more economical the company's added value is, the better the situation is. In other words, positive economic value added represents the optimal allocation of resources, the creation of value in the company and the increase of shareholders' wealth. On the other hand, negative economic value added indicates the waste of resources and the inefficient and inefficient allocation of the company's resources, and consequently the loss of shareholders' wealth. If the economic value of a company is positive, the company is profitable for the shareholders, and this profit reflects the capabilities of the company's portfolio of managers, hence the economic value added is called "management benefit".

Reasons for introducing economic value added

A company can be considered as a set of diverse contracts that deals with many users. These stakeholders include shareholders, managers and employees, customers, government creditors, and so on.

Consumers provide companies with economic resources and services and instead expect to receive rewards, shareholders of the company will risk a risk that is related to the company's performance and the ability to execute contracts with other users. The company, after the other users, can distribute the remaining amount among the shareholders. On the basis of the risk function and the return of shareholders, through the acquisition of equity rights, the company obtains a

potential unlimited return on the profit for the remaining profit.

Affiliates as risk takers must invest in different companies in order to increase their performance. Therefore, they will reduce their risk by diversifying their portfolios. In a competitive market price risk by shareholders who are better able to venture to endure determined, for example, investors who have portfolios are good, the market price risk only risk reflects the portfolio cannot be excluded (to the systemic risk they and Stems from the general conditions of the economy).

The primary criteria, such as earnings profit growth, EPS (EPS), cash dividends (DPS), and return on equity (ROI) were flawed by using accounting earnings.

Economic value added and management effects

With a closer look and a search engine, it can be seen that there are different procedures for responding to managers, and thus different ways to reward managers. Therefore, it has always been the question of which method and amount of rewards are suitable for managers who are from one the party motivates the managers and, on the other hand, makes them more likely to be more productive and, therefore, wake up. What is certain is that capitalism's viewpoint always emphasizes the increasing wealth of shareholders and investors. Therefore, it should always be noted that the efficiency and effectiveness of multi-unit units are important, or the encouragement of successful managers can accelerate this increase in wealth. One of the basic procedures for managing directors is the creation of a collateral stock system. Another way of assessing their performance and rewards is in line with this assessment, but what is the method of evaluation is desirable. The economic value-added basis can be one of the most desirable bases for performance evaluation. That is, based on the economic value added of the executives and even a percentage of the rewards.

Given the orientation of the EVA, operational managers have three important motivational factors as follows:

- 1-Trying to get more efficiency from existing facilities
2. Investment in a project whose rate of return exceeds the cost of capital.
3. Transfer of investments and projects whose capital cost is higher than their rate of return.

Benefits of economic value added

1. The economic value added has a close relationship with the net present value (NPV).

2. The economic added value of senior executives responds to a criterion that is most controlled by them.
3. The economic value added is influenced by all the decisions that corporate executives make.
4. The economic value added is a good indicator of the rewards of managers.
5. The economic value added is related to the market value of the company.
6. Economic value added as an economic performance criterion is consistent with other criteria such as value added of cash flow of investment, shareholders' value added and return on cash flow on investment.
7. The economic value added as a benchmark for measuring the success of a company's ability to add value to its shareholders' equity is best demonstrated.
8. Economic value added shows that the value of the company depends directly on management performance.
9. Economic value added can be the basis for determining investment objectives in projects.
10. Economic value added as a measure of lower performance is subject to accounting definitions.

Disadvantages of economic value added

1. The calculation of economic value added includes calculating the rate of return and the cost of capital, which is difficult.
2. The economic value added is usually calculated on the basis of historical figures.
3. Sometimes analysis of economic value added is impractical, for example, for companies that are newly launched or for investment companies, the EVA is not appropriate.

Research Methodology

1.6.1 Sample and data collection

The data used in this study is obtained from companies listed in Tehran Stock Exchange (TSE). The total numbers of companies listed in the Tehran Stock Exchange (TSE) are 337 over the period 2005-2009. Based on Morgan and Krejcie table, researcher has selected Stratified sampling and simple random sampling methods and randomly 180 companies listed in Tehran Stock Exchange (TSE) are selected as sample during 2005-2009.

Method of analysis of the study

In this study, Economic Value Added (EVA) is calculating below:

$$EVA (\text{model 1 \& 2}) = NOPAT - (IC \times WACC)$$

Calculation of EVA with WACC by Dividend Discount Model (DDM) is named EVA with model 1, and also EVA with WACC by Capital

asset pricing model (CAPM) is named EVA with model 2.

NOPAT is a measure of a company's cash generation capability from recurring business activities and disregarding its capital structure (Dierks & Patel, 1997).

The NOPAT is a function of earnings before interest payments and taxes (EBIT) and the tax rate of the firm (Young & O'Byrne, 2001). From the data given on the income statement, NOPAT is calculated as follows:

$$NOPAT = EBIT (1 - \text{Tax Rate})$$

The corporate Tax Rate in Iran is 25 % during study years (2005-2009).

Invested capital = Total assets - non-interest-bearing liabilities (NIBLs)

Thus invested capital is as following:

Invested capital = total debt + total shareholder's fund (total equity)

$$WACC = (K_e \times W_e) + (K_p \times W_p) + (K_d(pt)[1 - t] \times W_d)$$

Where:

WACC = Weighted average cost of capital

K_e = Cost of common equity capital

W_e = Percentage of common equity in the capital structure, at market value

K_p = Cost of preferred equity

W_p = Percentage of preferred equity in the capital structure, at market value

$K_d(pt)$ = Cost of debt (pretax)

t = Tax rate

W_d = Percentage of debt in the capital structure, at market value

There are 2 ways to calculate K_e - namely:

i) DDM (if given level of dividend & rate of growth) (Brigham, Gapenski, & Daves, 1999).

Cost of Equity = (Dividends per share / Price per share) + Dividend growth rate

$$K_e = D_1 / P_0 + G$$

ii) CAPM (If given the rate of risk & return) ((Stewart, 1991; Young and O'Byrne, 2001).

$$K_e = R_f + \beta (R_m - R_f)$$

Model Dividend Discount Model (DDM) and Capital Asset Pricing Model (CAPM) are used for cost of equity (K_e) of WACC to calculation EVA. In model 1, EVA calculated by using of Weighted Average Cost Of Capital (WACC) with DDM model; and in model 2, EVA calculated by using cost of equity (K_e) of WACC with CAPM model. This is including:

1- EVA of listed companies in TSE based on model 1,

2- EVA of listed companies in TSE based on model 2,

In this study, the obtained amount of value of EVA in all models represent value amount in million rails.

Finding and Analysis



EVA of listed companies in TSE based on model 1

This sub-set describes EVA of listed companies of TSE for each 5 years of 2005, 2006, 2007, 2008, and 2009. And as well as explain the average of EVA of listed companies of TSE for 5 years of the study. For each year is interpreted maximum, minimum, and mean for positive and negative

EVA of listed companies of TSE.

EVA of listed companies of TSE in 2005 (model 1)

According table 1, minimum and maximum for EVA in 2005 are -617452.329 and 1998110.243. The results show that average of EVA of listed companies of TSE in 2005 is 52109.

Table 1: Descriptive analysis of EVA of TSE in 2005 (model 1)

	N	Minimum	Maximum	Mean	Std. Deviation
EVA 2005	180	-617452.329	1998110.243	52109	186798.5745

Figure 1 shows that Saipa Co. (EVA=1998110.2; No: 14), Iran Khodro Industrial Group Co. (EVA= 610205.1; No: 7), Khark Petrochemical Co. (EVA= 598947.5; No: 55), and Arak Petrochemical Co. (EVA= 490570.5; No: 58) have maximum positive EVA in 2005.

And Bahman Group Co. (EVA= -617452.3; No: 16), Iran National Copper Industries Co. (EVA= -312737.3; No: 28), Rena Industrial Group Investment Co. (EVA= -154007.2; No: 5), and Sepahan Cement Co. (EVA= -55519.07872; No: 169) have minimum negative EVA in 2005

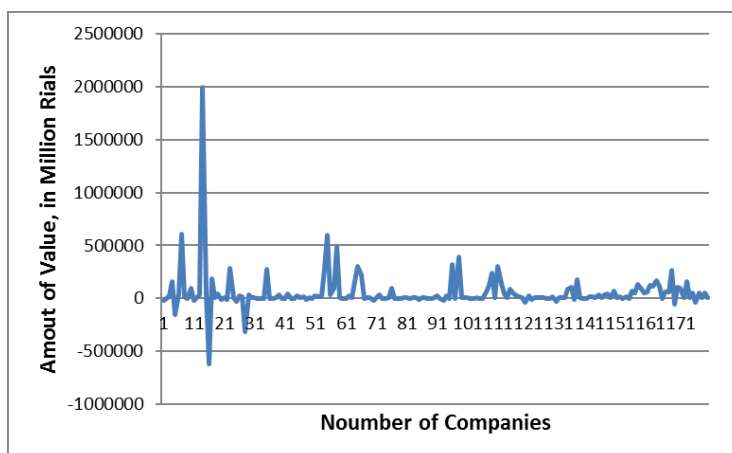


Figure 1: EVA of listed companies of TSE in 2005 (model 1)

EVA of listed companies of TSE in 2006 (model 1)

According table 2, minimum and maximum for EVA in 2006 are -1286947.5 and 1272261.344. The results show that average of EVA of listed

companies of TSE in 2006 is -10828.

Table 2: Descriptive analysis of EVA of TSE in 2006(model 1)

Table 2: shows that Iran Khodro Industrial Group Co. (EVA=1272261.4; No: 7),

	N	Minimum	Maximum	Mean	Std. Deviation
EVA 2006	180	-1286947.5	1272261.344	-10828	175274.33

Khark Petrochemical Co (EVA=327113.7; No: 55), Gol-E-Gohar Iron Ore Co. (EVA=313335.4; No: 96), and Tehran Cement Co. (EVA=236546.8; No: 168) have maximum positive EVA in 2006.

And Iran National Copper Industries Co. (EVA= -1286947.5; No: 28), Shomal Cement Co. (EVA= -

928420.5; No: 170), Bahman Group Co. (EVA= -657816.6; No: 16), and Informatics Services Corp. (EVA= -426970.6749; No: 179) have minimum negative EVA in 2006.

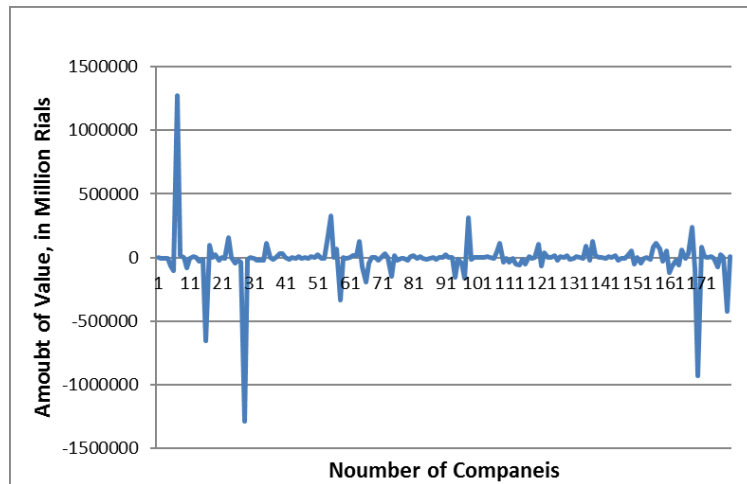


Figure 2: EVA of listed companies of TSE in 2006 (model 1)

EVA of listed companies of TSE in 2007 (model 1)
According to table 3, minimum and maximum for

EVA in 2007 are -1949632.145 and 1237975.028.
The results show that average of EVA of listed companies of TSE in 2007 is -12789.

Table 3 : Descriptive analysis of EVA of TSE in 2007(model 1)

	N	Minimum	Maximum	Mean	Std. Deviation
EVA 2007	180	-1949632.145	1237975.028	-12789	234330.18

Figure 3 shows that Khark Petrochemical Co. (EVA=1237975.1; No: 55), Gol-E-Gohar Iron Ore Co. (EVA=639208.2; No: 96), Arak Petrochemical Co. (EVA=554951.2; No: 58), Behran Oil Co. (EVA=380427.99; No: 107), and Sepahan Cement Co. (EVA=380427.99; No: 169) have maximum positive EVA in 2007.

And Iran Khodro Industrial Group Co. (EVA=-1949632.14; No: 7), Bahman Group Co. (EVA=-1129196.9; No: 16), Saipa Co. (EVA=-837591.95; No: 14), and Iran National Copper Industries Co. (EVA=-760581.7; No: 28) have minimum negative EVA in 2007.

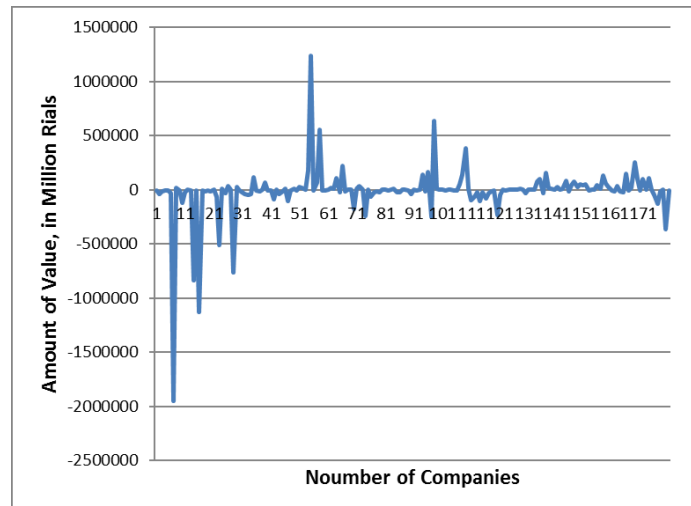


Figure 3: EVA of listed companies of TSE in 2007 (model 1)

EVA of listed companies of TSE in 2008 (model 1)
According to table 4, minimum and maximum for

EVA in 2008 are -1535343.191 and 3223790.789.
The results show that average of EVA of listed companies of TSE in 2008 is 14329.

Table 4: Descriptive analysis of EVA of TSE in 2008 (model 1)

	N	Minimum	Maximum	Mean	Std. Deviation
EVA 2008	180	-1535343.191	3223790.789	14329	339703.4617



Figure 4 shows that Iran National Copper Industries Co. (EVA= 3223790.79; No: 28), Khark Petrochemical Co (EVA= 1322836.52; No: 55), Gol-E-Gohar Iron Ore Co. (EVA=1135620.34; No: 96), and Iran Khodro Industrial Group Co. (EVA=831734.57; No: 7) have maximum positive EVA in 2008.

And Saipa Co. (EVA= -1535343.19; No: 14), Bahman Group Co. (EVA= -1318342.16; No: 16), Zamyad Co. (EVA= -703480.61; No: 17), and Behshahr Industrial Development Corp. (EVA= -450985.2771; No: 42) have minimum negative EVA in 2008.

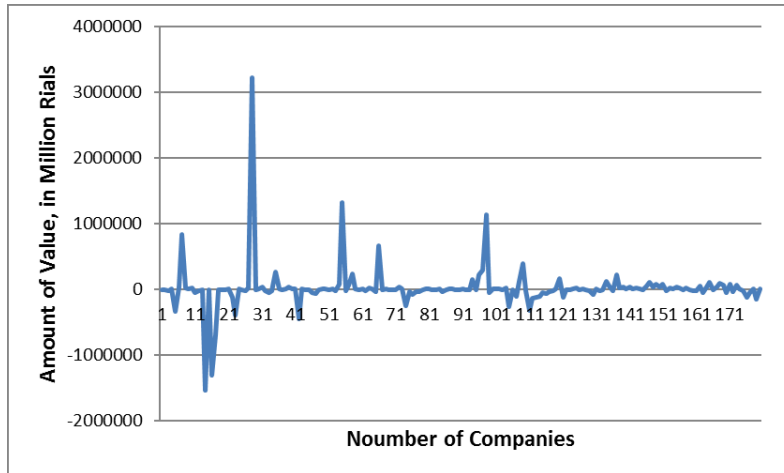


Figure 4: EVA of listed companies of TSE in 2008 (model 1)

EVA of listed companies of TSE in 2009 (model 1)
According table 5, minimum and maximum for EVA in 2009 are -3229753.037 and 925358.7368.

The results show that average of EVA of listed companies of TSE in 2009 is -77477.

Table 5: Descriptive analysis of EVA of TSE in 2009 (model 1)

	N	Minimum	Maximum	Mean	Std. Deviation
EVA 2009	180	-3229753.037	925358.7368	-77477	403128.3064

Figure 5 shows that Gol-E-Gohar Iron Ore Co. (EVA= 925358.74; No: 96), Chadormalu Mineral & Ind. Co. (EVA= 749578.45; No: 94), International Construction Development Co. (EVA= 471173.32; No: 118), and Iran Khodro Industrial Group Co. (EVA= 326572.61; No: 7) have maximum positive EVA in 2009.

And Iran National Copper Industries Co. (EVA= -3229753.04; No: 28), Saipa Co. (EVA= -2957102.15; No: 14), Bahman Group Co. (EVA= -1640696.77; No: 16), and Informatics Services Corp. (EVA= -1308288.87; No: 179) have minimum negative EVA in 2009.

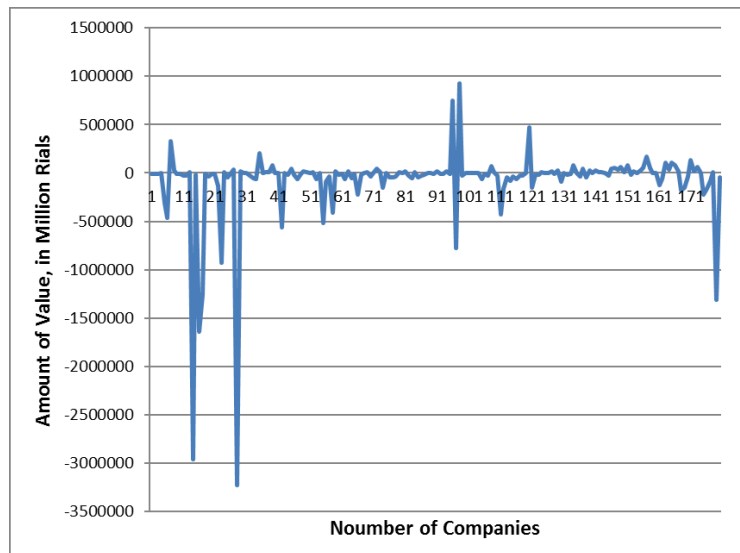




Figure 5: EVA of listed companies of TSE in 2009 (model 1)

EVA of listed companies of TSE in 2005-2009 periods based on model 1
According table 6, minimum and maximum for EVA in 2005-2009 periods are

-1072700.949 and 681565.8203. The results show that average of EVA of listed companies of TSE in 2005-2009 periods is -6931.

Table 6: Descriptive analysis of EVA of TSE in 2005-2009 periods based on model 1

	N	Minimum	Maximum	Mean	Std. Deviation
EVA 2005-2009	180	-1072700.949	681565.8203	-6931	143133.6587

Figure 6 shows that Gol-E-Gohar Iron Ore Co. (EVA=681565.82; No: 96), Khark Petrochemical Co (EVA=593623.53; No: 55), Chadormalu Mineral & Ind. Co. (EVA=283298.4979; No: 94), and Iran Khodro Industrial Group Co. (EVA=218228.29; No: 7) have maximum positive EVA in 2005-2009 periods.

And Bahman Group Co. (EVA=-1072700.95; No: 16), Saipa Co. (EVA=-672749.06, No: 14), Iran National Copper Industries Co. (EVA= -473245.75; No: 28), and Informatics Services Corp. (EVA= -439499.72; No: 179) have minimum negative EVA in 2005-2009 periods

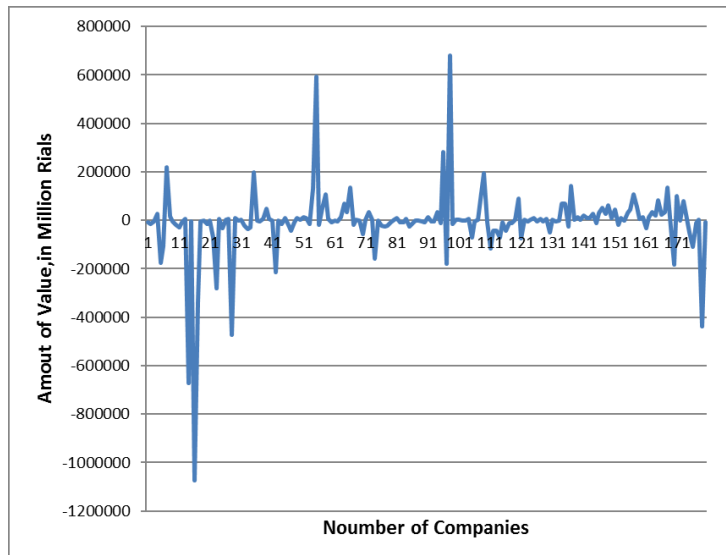


Figure 6: EVA of listed companies of TSE in 2005-2009 periods (model 1)

EVA of listed companies of TSE based on model 2
In model 2, EVA calculated by using WACC with CAPM model. According table 7, minimum and

maximum for EVA in 2005-2009 periods are -444978.63 and 4567185.67. The results show that average of EVA of listed companies of TSE in 2005-2009 periods is 80035

Table 7: Descriptive analysis of EVA of TSE in 2005-2009 periods in model 2

	N	Minimum	Maximum	Mean	Std. Deviation
EVA 2005-2009	180	-444978.63	4567185.67	80035	417359.33

As shown in figure 7, Iran National Copper Industries Co. (EVA= 4567185.676; No: 28), Saipa Co. (EVA= 2632492.864; No: 14), and Khark Petrochemical Co. (EVA= 1454523.533; No: 55) have maximum positive EVA in 2005-2009 periods.

Bahman Group Co. (EVA= -444978.6377; No: 16), Bahman Investment Co. (EVA= -205230.1618; No: 112), Shomal Cement Co. (EVA= -203117.67; No: 170) and have minimum negative EVA in 2005-2009 periods.

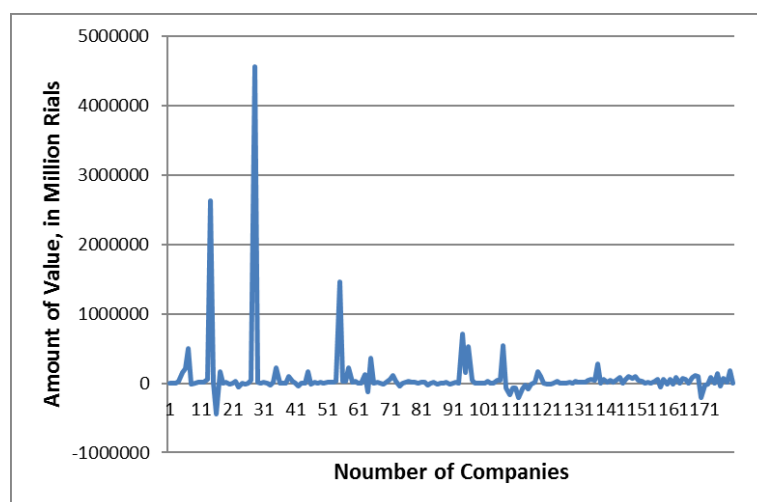


Figure 7: EVA of listed companies of TSE in model 2

Results

The objective of the business unit is to increase the stockholders' wealth, so providing them with the expected returns is very important. Investors and creditors are looking for an accurate measure to assess the company's performance and decide on a new investment, whether to continue or exit. Economic value added is an analytical tool for finding the true value of a company, in other words, a replacement for accounting profit as a measure of performance measurement.

The business unit aims to increase shareholder wealth, so it is important to secure the expected returns. Investors and creditors are looking for an accurate benchmark for evaluating a firm's performance and deciding whether or not to invest in a new venture. Economic added value is an analytical tool for finding the true value of a company, in other words, an alternative to

accounting profitability as a measure of performance evaluation.

Economic value added is very useful as a measure of performance index. The calculation shows how and where a company creates wealth and value by importing balance sheet items using this method. This makes managers aware of assets and costs when making management decisions. However, the calculation of economic surplus value strongly emphasizes the amount of capital invested and should be better suited for stable or mature venture capital firms. It may not be desirable to use economic value added techniques in companies with intangible assets such as technology companies and knowledge base.

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