Economic value added and comparing it to other financial operational approaches for explaining company's market value in different industries in Tehran stock exchange

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Abstract

The main goal of the firms is shareholder wealth maximization. Today, investors, creditors and managers attempt to find a timely and reliable index to measure the wealth of shareholders. Performance measurement is an effective factor on shareholder wealth maximization. Firms performance measurement to ensure efficient allocation of limited resources is vital and if appropriate measure of performance and shareholder value are not used the, firm doesn't move into real value and allocating capital is not done correctly. The present study determined the best variable explaining the market value of the companies listed on TSE. To do this, the effect of four variables including 2 criteria of traditional performance (net operating profit after tax, P/E per share) and two criteria of economical performance evaluation (economic value added (EVA) and free cash flow) on market value of the company were evaluated. The study sample consisted of companies of four industries (cement, automobiles, pharmaceuticals and chemicals) listed on TSE during the 1998-2009 were chosen. Results indicate that the type of industry is effective in determining the best variable determining the market value of the company and no single measure is presented as the best measure of determining the market value of the company a in all industries.

Keywords: Economic value added, company's market value, net operating profit after tax, Free cash flow, P/E.

Introduction

Today, one of the most important financial issues in the companies is measuring their performance.

The fact that how much the company attempted to increase the benefits of the stockholders, what are the indices for the banks and credit institutions to give loan to the companies, what dimensions are considered by the owners of the companies to pay the reward to the managers, finally, what are the points considered b y state organizations based on the legal requirements in relation with the companies and all of them are responded well by evaluation of the performance of the companies method as well (Bacidor *et al*,1997).

From the view of capital market, it is important to define how much the value is increased and which scale is the best index of measuring the values. Economic value-added is the best scale of value creation and it is also applied as measuring index of business institutions performance and determining the value of securities (Stern, 1991). From the view of capital market, the effects of EVA and free cash flows are reflected in securities price and companies' value and Market Value Added (MVA) is influenced by the difference of economical value added ratio and free cash flow (Young, 2001).

The investigation of the important factors of stock price changes in TSE can lead into the identification of variables determining the price changes and finally improving the investors' decision making and optimal allocation of the resources. Indeed, by defining the factors of stock price changes, the mind of investors will change regarding the effective factors on stock price changes and due to true pricing, the attractions of capital market are increased and capital market is developed.

The present study investigated the effective factors on stock market value in economical, social and cultural environment of Iran. As the economical, social and cultural environment of Iran is different from other countries, the effective factors on its stock value and

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return on stock can be different from other countries. To fulfill the purposes of the study, first the theoretical basics and review of literature were evaluated. Then, the hypotheses and study method were discussed. Finally, the results of the study were analyzed.

Review of literature

The review of literature on the evaluation of performance and determining the market value are related to a series of common studies and evaluation instruments and criteria of performance are different. In some studies, traditional measures of performance evaluation are the best measure (opponents to EVA) and in some studies, the value-based measures were introduced as the best measure. According to Stewart, two groups of opponents and proponents of EVA are raised. However, in the investigations, it can be said that some of them were indifferent (neither proponent, nor opponent).

International studies

Uyemura *et al.* (1996) in a study investigated the determination of explanatory power of fluctuations of MVA among some variables as EVA, return on assets, return on equity, EPS and net profit. To do this, a sample of 100 holding companies of bank member of Stern Stewart institution were selected during a period 10-year from 1986 to 1995. The results of the study showed that EVA had major share of the fluctuations of MVA compared to return on assets, return on equity, EPS and net profit measures. Bacidor *et al.*,(1997) believed that there is no ideal index to evaluate the performance of the companies. There are various methods to measure the performance and determine the value of the company and each of them has some demerits. If these methods are considered a measure to evaluate the performance and valuation of the company, it doesn't lead to the determination of the actual value of the company. The evaluation of the company's performance is a necessity and accepted measures should be used in this regard to show the various aspects of company performance. Biddle *et al.*, (1997) raised this question " Is EVA highly associate with return on stock and value of the company compared to accrual earnings or not ?and which part of EVA helped this association. By the investigation of 773 great American companies, it was found that earnings were highly associated with stock return compared to residual earnings and economic added value. While for some companies, EVA is an effective instrument for local decision making, performance measurement and reward motivations, it

cannot dominate earnings in relation to the return and stock price.

Kramer& peters (2001) in their study compared the self-correlation of EVA and MVA and the correlation between net operating profit after tax (NOPAT) and MVA among 53 industries during 1996-1978. They found that among 53 industries, only in 11 industries, there was correlation between EVA and MVA was better than the correlation between NOPAT and MVA. In the rest of the variables, the correlation between NOPAT and MVA was better. Fernandez (2001) by the introduction of a sample of European and American companies analyzed the relation between MVA and EVA, NOPAT and Weighted average cost of capital for 582 USA companies during 1983-1997. The results showed the negative relation between EVA and MVA. He found that NOPAT and weighted average cost of capital were highly associated with EVA. Keef *et al.*, (2003) in a study on a sample selected from Canada stated that there is no significant relation between EVA and Stock market performance. Kyriazis, Anastassis (2007) analyzed EVA by some companies in Athens stock market and found that although EVA is a useful performance measure, it is not related to stock holders value compared to other accepted accounting measures as net profit and operating earnings. Kim (2009) in a study to determine the explanatory power of stock return, investigated 6 performance measures as (economic value added, adjusted economic value added, market value added and three measures of traditional accounting). The results showed that adjusted value added and market value added were suitable measures for evaluation of companies performance.

Local studies

Anvar Rostami, Tehrani and Seraji (2004) investigated the relation between EVA, profit before interest and tax, cash flow from operation with stock market value of the companies listed on TSE. Their motivation was to show that "Does EVA describe the stock market value better than two other indices? The results of the study showed that at confidence interval 95%, it can be said that profit before interest and tax to EVA had high correlation with market value. EVA had less correlation with market value compared to operating cash flows. Kashani-pour and Rasaian (2007) in their study investigated the relation of 6 independent variables, EVA, Return on Equity, Return on Assets, EPS, Operating cash flows and profit division percentage with annual return on stock as dependent variable in TSE.

The results based on cross section and pooled regression showed the significant and relatively stable relation between annual return on stock and some of the local performance measure as return on equity, return on assets and EPS in the period of the study. Mahmoodabadi and Bayazidi (2008) investigated the comparison of explanatory power of residual earnings evaluation models and earnings abnormal growth in determining the companies' value. It was defined that there is no significant difference between explanatory power of these two models in determining the value of the companies generally and in various industries. Almost in all cases, residual earnings evaluation model had high explanatory power in determining the value of the companies.

Methodology

This study is applied in terms of aim as it investigates the relations of the variables in TSE and determined the relations and recommendations to improve the market efficiency.. This is a descriptive-correlation study and among different studies of correlation in terms of aim is regression analysis and it is inductive (from part to whole).

Study hypotheses

1. Economic value added had high explanatory power for market value compared to net operating profit after tax.

2. Economic value added had high explanatory power for market value compared to free cash flow.

3. Economic value added had high explanatory power for market value compared to P/E

The study hypotheses supported Stern & Stewart and Uyemura who believed that "EVA is the best variable to determine the explanatory power of market value of the company; also it is the best performance measure. The study hypotheses were inconsistent with the results of the study of Keef, Kim and Kyriazis, Anastassis as "Other variables of performance measure had higher explanatory power of market value of the company compared to EVA".

Study data, population and sample of the study

The study sample consisted of companies of four industries (cement, automobiles, pharmaceuticals and chemicals) listed on TSE during the (12-year) 1998-2009 were chosen. The study population met the following inclusion criteria:

1- The companies are listed before 1998 on TSE.

2- Due to the increase of comparability, their fiscal period leads into the end of Esfand.

3- During 1998-2009, they did not have any fiscal or activity change.

4- The companies' Beta coefficient was not computed for more than 3 years were excluded.

5- The Companies' market value is not computed for more than one year are excluded.

6- The Companies' EVA is not computed for more than two years are excluded.

To achieve the required information to process the study hypotheses, the existing information of Rahavard Novin software and the financial statements of the companies listed on TSE by referring to the site of TSE were applied. Based on the mentioned limitations, 51 companies were found. Thus, total 51 companies were tested and there was no sampling. In the present study, the hypotheses were tested at first in total companies and then in each group of the industries as separately.

Study variables

Conducting any study requires the determination and definition of each of the variables. The study variables are including:

• Market value of the company is the sum of stock holder equity value and the market value of the debts. It is denoted by MV.

• Economic value added: It is denoted by EVA:
EVA=Operating profit after tax-Capital costs

Operating profit after tax = Operating pro fit *(1-t)

Capital costs=Weighted average of capital costs*investment employed

Capital=Long-term capital+ Current portion of long-term debts+ Equity employed

• Net operating profit after tax: It is equal to earnings after tax from operations in which the impact cash record is eliminated and tax saving of financing costs is deducted. It is denoted by NOPAT.

• Free cash flow: It shows net cash amount created for the company and it is including costs, tax and the changes in net working capital and investment and it is denoted by FCF.

• Price to Earnings per share: It is equal to the division of the prices of per share by earnings per share and the data can be obtained from the existing software in stock market and it is denoted by P/E.

The results are summarized as the following equation

$$MV_{it} = \beta_0 + \beta_1(EVA_{it}) + \beta_1(NOPAT_{it}) + \beta_1(FCF_{it}) + \beta_1\left(\frac{P}{E}\right)_{it} \qquad (1)$$

Results

Regression results

The results of fitting of regression model for total study sample indicating the general significance of F regression model are shown in Tables 1-5. F statistics and significance level and its comparison with error level 5% showed the significance of regression model at confidence level 95%. Non-linearity between the independent variables investigated the independency of the residuals and adequacy of the models.

Table 1. The results of hypotheses test of total study sample

Variable	The number of observations	β	Significance (Sig)	Standardized Beta coefficient
Constant	-	-1113.828	0.1	-
EVA	612	5.588	0.00	0.349
NOPAT	612	3.744	0.00	0.301
FCF	612	0.213	0.00	0.055
P/E	612	504.187	0.00	0.299
F=129.299			Sig:0.00	

First hypothesis testing

As is shown in Table 1, coefficients table was including two types of non-standardized coefficients (β) and standardized coefficients. In no n –standardized coefficients, the variables coefficients are not similar with each other but in standardized coefficients, the variables scale is similar and the variables can be compared. To compare the effects of some independent variables on dependent variable, standardized coefficients were app lied (MOmeni and Ghayumi, 2007). Based on standardized beta coefficient, we can compared the explanatory power of these variables. As is shown in Table 1, this coefficient for NOPAT was 30.1%. While it was 34.9% for EVA. The results of the study showed that EVA has high explanatory power of market value of the company compared to NOPAT. Thus, based on the results of the study of first hypothesis at total study sample is supported.

Second hypothesis testing

Based on standardized beta coefficient, we can compare the explanatory power of the variables. As is shown in Table 1, this coefficient for free cash flow was 5.5% and for EVA was 34.9%. The results of the study showed that EVA had high explanatory power of market value compared to free cash flow. . Thus, based on the results of the study , second hypothesis at total study sample is supported.

Third hypothesis testing

Based on standardized beta coefficient, we can compare the explanatory power of the variables. As is shown in Table 1, this coefficient for P/E was 29.9%, while it was 34.9% for EVA. The results of the study showed that EVA had high explanatory power of market value compared to P/E . Thus, based on the results of the study, third hypothesis at total study sample is supported.

The study of the explanatory power of 4 variables with each other at total sample level

At total sample level, the best explanatory variables of market value were EVA, NOPAT, P/E and FCF. The results of each three hypotheses are shown separately of industry in Tables 2-5 and a general explanation of the performance of each of the criteria is expressed.

Table 2. The results of hypothesis test of cement industry

Variable	The number of observations	β	Significance (Sig)	Standardized Beta coefficient
Constant	-	1676.355	0.475	-
EVA	132	8.218	0.00	0.443
NOPAT	132	4.779	0.08	0.28
FCF	132	0.22	0.003	0.044
P/E	132	537.592	0.00	0.277
F=41.316			Sig:0.00	

Table 3. The results of hypothesis test of automobile industry

Variable	The number of observations	β	Significance (Sig)	Standardized Beta coefficient
Constant	-	1419.249	0.00	-
EVA	216	0.801	0.042	0.132
NOPAT	216	2.623	0.00	0.649
FCF	216	0.069	0.343	0.053
P/E	216	88.411	0.41	0.114
F=29.157			Sig:0.00	

Table 4. The results of hypothesis test of pharmaceuticals industry

Variable	The number of observations	β	Significance (Sig)	Standardized Beta coefficient
Constant	-	-2313.003	0.034	-
EVA	156	1.569	0.05	0.131
NOPAT	156	3.385	0.00	0.6483
FCF	156	0.07	0.699	0.024
P/E	156	902.36	0.00	0.433
F=25.5			Sig:0.00	

Table 5. The results of hypothesis test of chemical industry

Variable	The number of observations	β	Significance (Sig)	Standardized Beta coefficient
Constant	-	331.245	0.578	-
EVA	108	1.016	0.179	0.115
NOPAT	108	4.071	0.00	0.564
FCF	108	0.44	0.699	0.269
P/E	108	36-922	0.307	0.06
F=50.686			Sig:0.00	

The results of hypothesis test

Table 6. The results of the hypotheses based on industries separately

Study level	The result of multiple regression
Cement	$EVA > NOPAT > \frac{P}{E} > FCF$
Automobile	$NOPAT > \frac{P}{E} > FCF > EVA$
pharmaceuticals	$NOPAT > \frac{P}{E} > EVA > FCF$
Chemical	$NOPAT > FCF > EVA > \frac{P}{E}$
Total study sample	$EVA > NOPAT > FCF > \frac{P}{E}$

In cement industry, EVA, NOPAT, P/E and FCC, respectively were the best explanatory measures of market value of the company. In automobile industry, NOPAT, P/E, FCC and EVA were the best explanatory measures of market value of the company in this industry. In pharmaceuticals industry, the best explanatory variables of market value of the company were NOPAT, P/E, EVA, FCC, respectively. In chemical industry, the best performance measures were NOPAT, FCC, EVA, P/E, respectively. At total study sample including four industries, the result was completely different form the results of each industry.

In cement industry and total sample, EVA was the best variable, in automobile, pharmaceuticals and chemicals industry, NOPAT was the best explanatory variable of the market value of the company.

Discussion and conclusion

Many researchers as Stern & Stewart and Uyemura in their studies referred to the superiority of EVA compared to other performance measure and explanatory power of market value.

Generally, we can not give absolute answer about the best performance measure as besides the economi-

cal and financial conditions of different environments, other factors as study period, type of industry, company and variables and measures can be effective in determining the best measure of explanatory power of market value of the company. In every study, some of the performance measure variables are compared and all the variables were not investigated. Thus, we cannot express opponents and proponents to EVA and this classification is relative and each research based on time and place conditions compared some of the measures.

The results of hypothesis test by the information of sample companies during 1998-2009 showed that the type of industry was effective in determining the best performance measure and the best explanatory measure of market value of TSE.

Economic conditions of Iran and the applied policies by economical decision makers had different influence on various industries and it can make them lead into prosperity or stagnation. The market demand for production and services of the companies affected their profitability. For example, the company as exclusive producer of goods or services based on more power in determining the sale price achieves more profit. Thus, company activity structure and the industry in which the company works are important cases of decision making.

Limitations of the study

The limitations of the study were:

a. The first and the most limitation is the effect of other variables that are not controlled by the researcher and they affect the results of the study. Some variables as fluctuations of major economic indices, political conditions, capital market condition, company age, education and experience of the managers, error in earnings forecast and the type of industry are the effective variables. Based on the sampling method, it was attempted to minimize the effect of these variables but the results of the study should be applied based on these conditions.

b. Second limitation of the study is data collection. The data of some of the companies was not in existing data base and this is mostly due to the lack of presenting information from the companies.

c. Although it is attempted to select the sample based on the industry, due to the lack of variety of the companies in each industry and not having access and adequate data of some industries, it was problematic.

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