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Analyzing the Relationship between Economic Value Added and Accounting Measures with Share Market Value (MV) in Tehran Stock Exchange (TSE)

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Abstract

The purpose of this study is to examine the relationship between economic value added (EVA), return on assets (ROA), return on equity (ROE), net income (NI), and earning per share (EPS) with share market value (MV) in Tehran Stock Exchange (TSE). The sample involves 87 non-financial companies listed in Tehran Stock Exchange (TSE) over the period 2004–2008. Single and multiple regression methods were employed to analysis the scondary data. The results indicated there are meaningful correlation between EVA, ROE, NI, and EPS with MV, but there is not meaningful association between ROA and MV.

Keywords: Economic value added, return on assets, return on equity, earning per share, net income, share market value

Introduction

These days, according to company's development and separation of ownership from management, the discovery of appropriate criterion has become increasingly important for evaluating managers and company's performance (Nakhaei, Nik Intan, Melati, & Nakhaei, 2013). According to Jahankhani & Sohrabi (2010), in order to ensure optimal allocation of limited resources, evaluating of the companies' performance is vital. Suitable criteria for evaluating performance of the company or shareholder value must be used, if the value of the company does not propel toward real value, the funds are not allocated properly.

Basically, the criteria related to determine companies value and managers performance can be divided into two categories: (i) Traditional financial performance measures (Accounting measures), and (ii) Value based financial performance measures (Economic measures). In the accounting model, firm value is a function of various criteria such as profit, earning per share (EPS), rate of profit growth, return on equity (ROE), return on assets (ROA), divided per share (DPS), book value (BV), operational

cash flow (OCF), return on sales (ROS), and shares of supply and demand. In the value based model, firm value is a function of power of assets profitability, potential investors, and different between rate of return and weighted average cost of capital (WACC) (Jahankhani & Zariffard, 1995).

Most of the value based measures involve; economic value added (EVA), refined economic value added (REVA), market value added (MVA), cash value added (CVA), and free cash flow (FCF) (Pouyanfar, Rezaee, & Safabakhsh, 2010).

In assessing the company performance based on accounting measures, only the profit or net income are considered. These measures are not adequate, because they do not consider the cost of capital. One of the newest value based criteria is economic value added (EVA). Based on this criterion, the value of company depends on the yield and cost of capital employed. Hence, the difference between economic value added and accounting performance measures lays on the fact that in its determination efforts are made to consider the expenses of all financial resources (Lovata & Costigan, 2002).

The experiential studies emphasize that there is no single accounting criteria which illustrate the changeability in the stockholders wealth (Chen & Dodd, 1997). Each financial criterion that use for evaluation of company performance must be very connected with stockholders wealth. Accounting performance measures such as net profit (NP), net operational profit after tax (NOPAT), earning per shares (EPS), retern on investment (ROI), return on equity (ROE), and so on, have been criticized because their incapability to shape into a corporation full cost of capital, thus accounting income is not a consistent predictor of firm value and cannot be used for measuring corporate performance. Value based management system has gained popularity in academic literature in last two decades (Sharma & Kumar 2012).

The purpose of this study is to examine the relative explanatory power of the economic value added (EVA) model with respect to share market value compared to recognized accounting measures (ROA, ROE, NI and EPS) in the context of Tehran Stock Exchange (TSE). In other words, the purpose of this study is to investigate, whether EVA has better relationship with MV compare to accounting measures (ROA, ROE, NI and EPS). The results indicated there are meaningful correlation between EVA, NI, EPS and ROE with MV, but there is not meaningful association between ROA and MV.

The remainder of the study is organized as follows: The second section provides a summary review of prior literature. Research variables are reported in the third section. The fourth section presents the research Hypotheses. Methodology and testing the hypotheses are reported in section five and six respectively. The seventh section presents the research conclusion.

Litrature Review

EVA is a specific formulation of residual income, which has been used in the past, and the idea that managers should return a higher rate than the cost of capital is also not new (Bromwich & Walker, 1998). Stewart's major contribution is the measurement of residual earnings, capital, and cost of capital (Lovata & Costigan, 2002).

Stewart (1991) first provided evidence of the correlation between EVA and market value added (MVA). Lehn and Makhija (1997) analyzed the correlation degree between various performance measures and share market returns. The consequence point out that there are most highly associated between EVA and share market returns and this correlation was slightly better than with traditional performance measures such as ROA, ROE and ROS.

De Wet (2005) investigated the relationship between EVA and traditional accounting measures with MVA. The study rooted on the data of firms listed on the JSE South Africa from 1994-2004. The results demonstrated strongest association between MVA and operational cash flow. The standardized relationship between MVA and OCF, ROA, and EVA is 38%, 15%, and 8% respectively. The study also found very little relationship between EPS and DPS with MVA. Yaghoob-nejad and Akkaf (2007) stadied the relationship between EVA, residul income (RI), ROS, and return on investment (ROI) with MVA. Their finding exhibited there are meaningful relationship between EVA, RI, ROS, and ROI with MVA.

Paula & Elena (2009) examined the association between EVA, EPS,OCF, and DPS whit Market value added (MVA) during the period of 1994 to 2004. The results showed there are stronger

relationship between MVA and operational cash flows (OCF) but EVA did not show the strongest association with MVA. The results also revealed very little relationship between MVA and EPS, or between MVA and DPS. Darabi & Esfandiyari (2009) made a study on MV and refined economic value added (REVA), as well as other accounting variables such as profit befor interest and tax (PBIT) and operational cash flow (OCF). The study revealed the assosiation between PBIT with MV is more than the assosiation of REVA and OCF with MV. Moreover, the result indicated PBIT have a stronger relationship and greater explanatory power with MV compare to REVA and OCF.

Yahyazadehfar, Shams, and Larimi (2010) investigated the relationship between MVA and EVA, as well as other financial ratios such as ROA, ROE, and EPS for companies listed in Tehran Stock Exchange (TSE) over the period 2000-2006. This study found there is a meaningful relationship between ROE and EVA with MVA, but there is not meaningful correlation between ROA and EPS with MVA.

Sharma and Kumar (2012) examined whether EVA can be employed as a tool of performance measures while investing in Indian market and give confirmation about its dominance as a financial performance measure as compared to traditional performance measures (EPS, ROE, ROA, OCF, NOPAT, NI, and RI) in Indian companies. To test the hypotheses and to know the efficacy of various performance measures Panel data regression was used. The results exhibited that EVA is significant connection with MVA and there is positive relationship between EVA and MVA of Indian firms. Furthermore, the results indicated that EPS and RI dominate than EVA in explanation the MVA. They suggest that investor should employ EVA together with traditional measures in evaluation of company and making investment strategy.

Research Variables

In this study, economic value added (EVA), return on assets (ROA), return on equity (ROE), net income (NI), and earnings per share (EPS) are independent variables, and share market value (MV) is dependent variable.

Economic Value Added (EVA)

EVA, MVA and their predictable benefits are introdused by the book of Bennet Stewart, The Quest for Value (1991). EVA is advanced as being preferred to other comparatively economical measures such as earning per shares (EPS), return on assets (ROA), return on equity (ROE) in aligning stockholder and manager goals.

Stewart (1991) states:

Every company's most important goal must be to increase its EVA. Let that be your quest. Forget about earnings, earnings per share, earnings growth, dividends, rate of return, and even cash flow. All of them are fundamentally flawed measures of performance and value. EVA is all that really matters (pp. 175–177).

EVA is a method of measuring the economic value of a business after considering capital cost including debt cost and equity cost (Stewart 1991). On the basis of accounting standards in calculation of typical accounting indexes only cost of debt is considered, while in calculation of EVA, in addition to cost of debt also the cost of equity is deducted (Noravesh, Salehy, & Karamy, 2004). The key point of the EVA, is that value is created when the rate of investment return is more than the rate of total capital cost, which means the cost of capital, encompasses the risk of investment (Biddle, Bowen, & wal -lace, 1998). In order to calculate the EVA, the total employed cost of capital is deducted from operating profit after the tax (Noravesh & Mashayekhi, 2004).

$$EVA_t = NOPAT_t - (WACC_t \times Capital_{t-1}) \quad (1)$$

Where: EAV is economic value added, NOPAT is net operational profit after tax, and WACC is weighted average cost of capital.

Also we can attain EVA from the difference between return on invested capital (ROIC) and cost of capital and its product on the economic cash value of capital which the company has employed.

$$EVA_t = (ROIC_t - WACC_t) \times Capital_{t-1} \quad (2)$$

Where: ROIC is return on invested capital. Return on invested capital, measures the productivity of employed capital without regard to method of financing and accounting deviations Which is originated from accrual records, conservative concept, and no consideration of unsuccessful attempts to capital and this rate may be compared directly to the rate of capital cost so that the creation or vanishing of value in the company is specified. For the calculation of rate of invested capital, net operational profit after tax is divided to the total employed capital.

$$ROIC = \frac{NOPAT}{Capital} \tag{3}$$

$$WACC = \left[CD \times \frac{TD}{TD+TE} \times (1-T) \right] + [CE \times \frac{TE}{TD+TE}] \tag{4}$$

Where: WACC is waighted average cost of capital, CD is cost of debts, TD is total debts, TE is total equity, CE is cost of equity, and T is tax rate.

The capital assets pricing model (CAPM) is used for the calculation of economic value added:

$$R_I = R_F + [(R_M - R_F) \times \beta] \tag{5}$$

Where: R_I is rate of expected shares return, R_F is rate of return without risk, β (Beta) is systematic risk or share market or level of return surplus sensitivity of company in relation to market return surplus which is calculated as follows:

$$B = \frac{COV(R_i, R_m)}{VAR(R_m)} \tag{6}$$

R_M is expected return of the market which will be calculated as follows;

$$R_M = \frac{I_t - I_{t-1}}{I_{t-1}} \tag{7}$$

Where: I_t is common index of market in the end of the term–t, It_{-1} is common index of market in the beginning of the term-t.

Return on Assets (ROA)

ROA is one of the profitability ratios. It shows the efficient management at using assets to generate earnings. The ratio of net income to total assets measures the return on total assets (ROA) after interest and taxes(Brigham & Ehrhardt, 2005):

ROA = Net profit / Total assets

$$ROA = \frac{NP}{TA} = \frac{NP}{TS} \times \frac{TS}{TA} \tag{8}$$

Where: NP is net profit, TA is total assets, and TS is total sale.

Return on Equity (ROE)

According to Chandra Shil (2009) “Among all traditional measures, return on capital is very common and relatively good performance measure. Different companies calculate this return with different formulas and call it also with different names like return on investment (ROI), return on invested capital (ROIC), return on capital employed (ROCE), return on net assets (RONA), return on equity (ROE) etc.” “Stockholders invests to get a return on their money, and this ratio tells how well they are doing in an accounting sense” (Brigham & Ehrhardt, 2005). The calculation of ROE can be broken up into three separate ratios, as follows:

$$ROE = \frac{NP}{TE} = \frac{NP}{TS} \times \frac{TS}{TA} \times \frac{TA}{TE} \tag{9}$$

Where: TS is total sales, TE is total equity, TA is total assets, NP is net profit or net income (NI).

Net Profit / Net Income (NI)

Net profit (NP) is calculated by subtracting the total expenses of company from total revenues. It shows what the firm has earned (or lost) in a given period of time (usually one year). Furthermore, it is

called net income (NI) or net earnings (NE). On the other words, net income represents the amount of money remaining after all operating expenses, interest, taxes and preferred stock dividends (but not common stock dividends) have been deducted from a company's total revenue (Nakhaei, Nik Intan, Melati, & Nakhaei, 2012).

Earning Per Share (EPS)

Measuring of performance of firm's per share is EPS. It equal the net profit divides the number of outstanding stocks. In compared to profit, EPS is a relative criterion because it considers the capital size. It does not consider the capital cost like profit (Irala, 2005).

$$EPS = \frac{\text{Net profit - Dividends on preferred stock}}{\text{Average outstanding shares}} \quad (10)$$

Share Market Value (MV)

In this study share market value is a dependent variable. Share market value is total stock market value and book value of interest-bearing liabilities.

Research Hypotheses

According to the above mentioned literature as well the objective of the study the following hypothesis is postulated in the study:

H1: There is a significant relationship between EVA and MV.
H2: There is a significant relationship between ROA and MV.
H3: There is a significant relationship between ROE and MV.
H4: There is a significant relationship between NI and MV.
H5: There is a significant relationship between EPS and MV.

Methodology and Testing the Hypotheses

This study is a deductive research. This study is also a correlative study since it seeks to investigate the relationship between dependent and independent variables. It is a periodic study because it studies a specific period of time and it can be an applied research. In order to gather theoretical information, library research was selected and the books in the libraries together with articles found in internet were used. The sample data of this study was restricted to non-financial companies, which were listed in TSE and with available annual trading data during the period of 2004 through 2008. The financial companies such as holdings and investments are excluding from the sample data, in order to have consistent interpretation on certain company characteristics such as earnings and size. The sampling method is the systematic elimination and the sample firms must have following conditions:

1. Information must be available for the past 5 years.
2. Fiscal year must be ended at the end of year (20^{th} of March).
3. Transaction intervals must not be more than 6 month.
4. Data must be available for testing hypotheses

The regression model used in this study are as follows:

$MV_{it} = \beta_0 + \beta_1 EVA_{it} + \beta_2 ROE_{it} + \beta_3 ROA_{it} + \beta_4 NI_{i\,t} + \beta_5 EPS_{it} + e_{it}$

Where: MV is share market value, EVA is economic value added, ROE is return on equity, ROA is return on assets, NI is net income, EPS is earning per shares, and E is a random disturbance term. To determine the relationship between variables, linear regression ANOVA is used.

Table 1: One-way ANOVA[b]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.44E+15	4	6.013E+12	77.321	0.00[a]
Result	3.69E+15	364	6.021E+10		
Total	**6.13E+15**	**368**			

a. Predictor: EVA, ROA, ROE, NI, EPS
b. Dependent variable: MV

The results of ANOVA test in table 1 reveal that the significatnce level test is less than 5%. Therefor, there are a linear relationship between EVA, ROA, ROE, NI and EPS (independent variables) with MV (dependent variable).

For data analysis and hypotheses testing, coefficient of determination, single and multivariate regression, Durbin-Watson test is applied using the E-Views software. The results are summarized in Table 2.

Table 2: Raw regression coefficients, coefficient of determination, and Durbin Watson test

Independent Variables	Dependent Variable = MVA							
	B	**t**	**Sig.**	**Result**	**Adjusted R^2**	**Sig.**	**R^2**	**Durbin-Watson**
β0	627121.12	2.89291	0.0075	-----	0.82731	0.0000	0.83132	1.74231
EVA	6.928562	11.35572	0.0000	Accept				
ROE	−359.6172	−4.95283	0.0000	Accept				
ROA	3260.186	0.71238	0.4956	Reject				
NI	7.132456	13.23561	0.0130	Accept				
EPS	2346.324	2.205290	0.0311	Accept				

The results of regression in table 2 show there are relationship between EVA, ROA, ROE, NI and EPS with MV. In other words, independent variables can exhibit 83% changes in MV, and other variables can reveal 17% of changes in MV. Moreover, the findings illustrate there are meaningful assosiation between EVA, ROE, NI, and EPS with MV, becaue the significance of F is less than 5%. Besides, the results reveal there is not meaningful correlation between ROA and MV, because the significant of F (significanc F = 0.4956) is more than 5%.

Coclusion

This study investigates the relationship between economic value added (EVA), return on equity (ROE), return on assets (ROA), net income (NI), and earning per share (EPS) with share market value (MV) in non-financial listed companies in Tehran Stock Exchange (TSE) over the period 2004-2008. The results indicated there are meaningful relation between EVA, ROE, NI, and EPS with share market value (MV), but there is not meaningful association between ROA and MV. Furthermore, the findings shown EVA is effective measure in describing the firm's stock market value. The companies can use EVA with other measures to evaluating of company performance. These measures can help managers to consider all the cost of capital (debt and equity) and capital returns for improving the company performance and increasing the wealth of shareholders.

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