EVA's and REVA's relative and growing information on benefit predictions in Tehran stock exchange market accepted companies

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Abstract

The current research tries to introduce economic evaluation standards to the users and to increase the EVA's and REVA's relative and growing information content on benefit predictions. To reach this goal, the present research was done by testing 6 hypotheses in Tehran Stock Exchange Market during 1996 to 2008. Pearson correlation coefficient, determination coefficient and simple linear and multi-variable regression analyses were used for the data statistical analysis and testing the research hypothesis tests. Results from research hypothesis tests show that there is a significant relation between EVA and REVA on one hand and operating profit on the other. Also, EVA and REVA have increased information content.

Keywords: EVA, REVA, OCF, OI

Introduction

The increasing development of industry and consequently the growth of capital market have given rise to of corporate financing mechanisms, the higher complexity of financial relationships, the difficulty of analyzing corporate and market conditions by investors and analysts on one hand. On the other hand, accounting and financial sciences scholars such as Stewart (1991), Basidor (1997), Bausch (2003) and others, in line with the increasing growth of the capital market, have speeded up their investigations to discover the relationships among different capital market variables and factors affecting this market in order to develop new performance evaluation indices that are free from insufficiencies of previous indices.

For many years in the past, economists thought that all groups within a company (directors and shareholders) are working to achieve a common goal. However, since 1961 there have been many cases of conflict of interests between these groups (Jensen, &Meckling, 1976).

Conflict of interest implies that managers do not always act in order to maximize shareholders' interests. On the other hand, stockholders are always looking for ways to evaluate the managers' performance to create wealth for companies as one way of dealing with conflicts of interest between shareholders and managers is the development and the use of performance evaluation systems. However, in appropriate criteria are used in reality to evaluate the managers' performance.

Section 47 of the Financial Accounting Standards Board Statement No. 1 states earnings can be used to evaluate the profitability, ability to pay dividends, to predict future profits, and assess capital risk in companies. Therefore, accounting profit is the most important traditional measure of performance evaluation. However, this measure suffers from a number of shortcomings as it can be manipulated and its amount may be changed through different methods used to assess the inventory, R&D expenses, depreciation, and reserves.In addition, the capital cost is not taken into account when calculating accounting profit. To overcome these shortcomings; a new measure called economic value added was developed by Joel M. Stern and Jay Bennett Stewart in (1989) in order to evaluate the performance (Financial Accounting Standards Board, 1985).

Despite the advantages of economic value added as a criterion for performance evaluation, it suffers from a weakness when it is used.Unlike, in-

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terest rates and rates of return, the use of economic value added to compare different companies with different sizes is difficult.But this weakness can be overcome so that the economic value added can be used to reflect the general level of capital in a standardized form.

In an attempt to overcome the above shortcomings, financial experts introduced a refined form of the economic value added as the refined the economic value added that focuses on the relatedness of information rather than emphasizing information reliability.In other words, this criterion calculates the opportunity cost of resources as the basis of market value (Bacidore, Boquist, & Thakor, 1997).

Given the significance of the economic value added for the evaluation of companies' performance, the present study examines economic criteria of performance evaluation (economic value-added and refined economic value added), and the assessment of relative and increasing information content to predict operational profit and factors affecting the prediction of corporate profit in order to take effective action to help shareholders make correct decisions using appropriate criteria for performance evaluation.

Theoretical framework of the study and review of literature

Accounting models of performance evaluation

Accounting models of performance evaluation (profit, earnings growth, earnings per share, return on investment, free cash flow, and dividends) that are based on accounting income numbers are criticized for various reasons such as disregard for the costs of financing through equity, having a retrospective vision, taking no notice of intangible assets that are involved in the process of value creation, and the possibility of manipulating such models by through various methods of accounting. On the other hand, the inconsideration of the outcomes of decisions and future events such as access to new markets and the production technology, new product innovation, labor strikes, and new legislation have made this criterion not to consider all factors affecting the decision making process. Therefore, investors and especially stockholders need criteria in order to be able to measure accurately the company's management performance and to some extent overcome criticisms on accounting income numbers (Ferguson, Rentzler, & Yu, 2005).

Economic models of performance evaluation

Given the objections made against accounting models of performance evaluation, financial researchers decided to introduce models to consider all factors influencing decision making in addition to eliminating the above, disadvantages. Next we briefly review new models of performance evaluation employed in the present study.

Economic value added (Eva)

Economic value added refers to the residual income that is obtained after deducting costs of capital by net operating profit after-tax:
$$EVA = NOPAT - kW\ (NA)$$

Where, NOPAT is the reported operating profit plus any increase in doubtful receivables reserves, evaluation reserves based on the last incoming first issued; amortization of goodwill, net amounts invested as R&D costs, and operating profits (including return on investment) after subtracting taxes on cash activities, KW is the weighted average of the cost of capital, and NA is net assets (book value of net assets at the beginning of the period) (Bacidore, Boquist, &Thakor, 1997).

Refined economic value added (Reva)

Although the economic value added uses more reliable information due to reliance upon historical figures, such information is not necessarily related. In other words, the economic value added measures the opportunity cost of resources used based on their book value while investors expect market-value-based returns (Bausch, Barbara, &Blome, 2003).

To overcome the disadvantages of EVA, Basidor et al., developed another performance evaluation measure called refined economic value added (REVA). The refined economic value added provides an analytic framework for evaluating the operational performance and the value created for shareholders.The refined economic value added is similar to the economic value added but the only difference is that the costs of capital are calculated based on the market value of corporate assets not based on the book value of assets when measuring the refined economic value added (Hosseini, &Akhari, 2006). The refined economic value added is equal to the residual income after deducting costs of capital to the market value of the net operating profit after tax:
$$EVA = NOPAT - K_w(MV_{t-1})$$

Where, *NOPAT* is the operating profits after tax at end of periodt; *KW* is the weighted average cost of capital and *MV$_{t-1}$ is the market value of equity plus the book value of total corporate liabilities after subtracting current interest free liabilities (all of which are related to the periodt-1*) (Bacidore, Boquist, &Thakor, 1997).

Background

Basidor*et al.*, (1997) studied 600 U. S. companies and observed that the economic value added is a good standard to evaluate the performance and to estimate the value created for shareholders. Besides, it was noted that the refined economic value added is superior to the economic value added to the evaluation of managers' performance and the value created for shareholders.

Machuga et al (2002) investigated the use of economic value added forecasting earnings per share. In addition to economic value added, they also used other variables such as current earnings, returns, and cash flows predict earnings per share.Their results suggested that the economic value added has a stronger predictability power than other variables to predict earnings per share.

Bausch *et al.*, (2003) studied the residual income based on market value and compared it with residual income based on book value.Their results indicated that, in an unlimited time, goals and results obtained from using economic value added, refined market value added, and market value added is the same.

Shariat (2003) in a study titled "The relationship between economic value added and operating earnings of automotive companies listed onthe Tehran Stock Exchange from 1995–200" concluded that there is a significant relationship between economic value added and operating earnings.

Noravesh and Mashayekhi (2004) conducted a study under "Incremental information content of economic value added and the cash value added versus operative earnings and funds from operations'. They found that operating earnings continue to be the best measure used by decision makers for financial and investment decisions.However, the economic value added and the cash value added have been added into users' decision making models.

Ferguson *et al.*, (2005) examined the effects of the adoption of economic value added on companies' performance evaluation. The results of this study indicated that the adoption of economic value added will enhance the companies' profitability.

Shariat and Badavar (2005) examined the relationship between the refined economic value added and the refined stock returns based on the risk of listed companies onthe Tehran Stock Exchange from 2001 to 2003. They observed that there is a relatively weak correlation between the refined economic value added and the ratio of reward to the variability and the ratio of reward to the volatility of returns.

Austin (2006) examined the economic value added as a measure to evaluate New Zealand air companies from 1995 to 2003.The results of the study suggested that the economic value added is used as a criterion to price the companies' products and services.

Hosseini, Akhari (2006) examined the relationship between economic value added the earnings per share, and price to earnings ratios.He concluded that there is no significant relationship between the refined economic value added, earnings per share, and price per earnings for each share.

Gouyandeh (2007) compared the information content of economic value added, and the refined economic value added in terms of the stock returns in listed companies, in Tehran Stock Exchange, from 1996 to 2005. The results of the study indicated that there the economic value added and the refined economic value added are not correlated with economic returns. However, the economic value added had a higher correlation with stock returns than the refined economic value added.

Cheng *et al.*, (2007) analyzed economic models of corporate financial performance evaluation in 32 Taiwanese companies from 1997 to 2003. They used the economic value added and market value to estimate companies' performance. Their results suggested that the economic value added can be more appropriate than the market value in order to evaluate corporate performance.

Aghuyi *et al* (2009) examined the relationship between economic value added and the residual earnings in predicting earnings per share for the coming year in companies listed onthe Tehran Stock Exchange from 1999 to 2004. They concluded that there is a significant relationship between the residual earnings and earnings per share for the coming year. Therefore, the residual earnings have the predictability power. Accordingly, the results of another study suggested that there is no significant relationship between economic value added and earnings per share for the coming year. So it does not have any predictive power (Aghuee, Vadiei, &Hosseini, 2009).

Research hypotheses

The research hypotheses are presented in two main groups as follows:

The first group: Analysis of the information content of each independent variable

Hypothesis I: There is a significant relationship between the refined economic value added and the future operating profit.

Hypothesis II: There is a significant relationship between the economic value added and the future operating profit.

Hypothesis III: There is a significant relationship between the current operating profit and the future operating profit.

Hypothesis IV: There is a significant relationship between cash from operations and the future operating profit.

The second group: The incremental information content of independent variables over the other variants

Hypothesis V: The economic value has incremental information content over the refined economic value added.

Hypothesis VI: The refined economic value added has incremental information content over the economic value added.

Methodology

A quasi-experimental and posterior research designed was used to explore research problem.The data were collected and analyzed from a naturally existed environmental or past events without the direct intervention of the researcher.A library and field method was used in the present study to collect the data from a population of all companies listed onthe Tehran Stock Exchange. Based on the features taken into account in this study, 56 companies were included in the research sample.The time under study was from 1996 to 2008.

The main research variables and how they are calculated

Parameters and variables used in the model under study, the resources used to obtain information about them, and how they are calculated are shown in Table 1.As shown in the table, the first four variables are independent variables or explanatory variables and the fifth variable is considered as the dependent variable.The independent variables are entered into econometric models in order to determine their information content.

Table 1. The main variables and how they are calculated

Method Of calculation	Abbreviation	Title
$EVA_t = NOPAT - WACC_t(capital_{t-1})$	EVA	Economic Value Added
$REVA_t = NOPAT - WACC_t(Mcapital_{t-1})$	REVA	Refined Economic Value Added
Net Income +Adjustment Is For Items Have Effects On Income But They Are Not Cash	OCF	0perational Cash Flow
operating profit	OI	operating profit
operating profit	OI_{t+1}	operating profit Next period

Results

Before testing the hypotheses, descriptive statistics the variables under study are shown in Table 2:

Testing the research hypotheses

Pearsoncorrelation coefficient (r) between the four independent variables and the operating profit in the next was estimatedto test the hypotheses. Also,

Table 2. Descriptive statistics of the variables under study

Variance	Standard Deviation	Average	Median	Statistic / Variable
20786247292	144174 /364	80651/31	34179	OI_{t+1}
34/625	5/8843391	0/582482	-0/004658	$REVA_t$
9/151	3/0250702	0/352409	0/008447	EVA_t
0/751	08663769/	0/223231	0/108593	OI_t
79/039	8/8903847	0/663966	0/020775	OCF_t

table 3shows that all four independent variables which are positively correlated with the future operating profit. Besides, there is a significant relationship between independent variables and the future operating profit.

Accordingly, the regression model was used to determine the relationship between the four independent variables and the future operating profit. In addition, the regression analysis was used as follows.

A regression model is a linear equation in which the refined economic value added; economic value added the current operating profit, and cash flow from operations is the independent variable, the operating profit is the dependent variable, β_0 is the model constant, β_1 is the coefficient of the independent variable and is e_{it} the model error. Model errors are written in the form of the four following models.

Table 3. Results of correlation test

616	Samples	
0/407	Coefficient Of Correlation	Hypothesis1
.000	P − Value	
Rejection H₀	Test Result	
616	Samples	
0/351	Coefficient Of Correlation	HypothesisII
.000	P − Value	
Rejection H₀	Test Result	
606	Samples	
0/523	Coefficient Of Correlation	Hypothesis III
.000	P − Value	
Rejection H₀	Test Result	
557	Samples	
0/331	Coefficient Of Correlation	HypothesisIV
.000	P − Value	
Rejection H₀	Test Result	

Table4. Error models

Error models	Model equations
Model I	$OI_{i(t+1)} = \beta_0 + \beta_1[\Delta REVA_{it} / REVA_{it}] + e_{it}$
Model II	$OI_{i(t+1)} = \beta_0 + \beta_1[\Delta EVA_{it} / EVA_{it}] + e_{it}$
Model III	$OI_{i(t+1)} = \beta_0 + \beta_1[\Delta OI_{it} / OI_{it}] + e_{it}$
Model IV	$OI_{i(t+1)} = \beta_0 + \beta_1[\Delta OCF_{it} / OCF_{it}] e_{it}$

The assumption of using the above models is the normality of obtaining errors. The statistics for each model are summarized as follows.

Table 5. The statistical summary of regression models

Watson Camera	Standard Deviation	R² Revised	R²	R	
2/008	137994/926	0/164	0/165	0/407	Hypothesis I
1/939	141435/101	0/122	0/123	0/351	Hypothesis II
1/943	121428/507	0/273	0/274	0/523	Hypothesis III
2/002	138810/424	0/108	0/109	0/331	Hypothesis IV

To test the significance of the regression models, ANOVA table and Fisher's test (F) are used as shown in Table6:

Also, as it's shown in table 6, the four regression models are significant at the error level of 5% ($P < 0.05$). Consequently, all independent variables have a significant effect on the future operating profit.

Table 6. ANOVA Table

Significant Level	F Statistic	Degree Of Freedom	Name	Model
0.000	121/686	1	Regression	
		614	Rest	I
		615	Total	
0.000	86/088	1	Regression	
		614	Rest	II
		615	Total	
0.000	227/237	1	Regression	
		602	Rest	III
		603	Total	
0.000	68/046	1	Regression	
		554	Rest	IV
		555	Total	

Fifth and sixth research hypotheses

Models, 1, 2, and 3 are used as follows to test the fifth and sixth hypotheses:

Model IV:

$$OI_{i(t+1)} = \beta_0 + \beta_1[\Delta REVA_{it} / REVA_{it}] + \beta_2[\Delta EVA_{it} / EVA_{it}] + e_{it}$$

The summary statistics for the above models are shown in Table 7:

Table 7. Summary statistics for regression models of the fifth and sixth research hypotheses

Watson Camera	Standard Deviation	R^2 Revised	R^2	R	Model
2/008	137994/926	0/164	0/165	0/407	I
1/939	141435/101	0/122	0/123	0/351	II
1/976	133821/067	0/214	0/216	0/465	V

Given that the adjusted determination coefficient in Model 5 (Table 7)- when the economic value added is added to refined economic value and vice versa – has the highest value; indicating that when the economic value added is inserted in Model 3 and the refined economic value added is inserted into Model 4 provided that the overall model is significant, Model 5 can explain more changes in the dependent variable (the future operating profit) than the other two independent vari-

ables i.e. the economic value added and the refined economic value added. In other words, it has more information content.

To test the significance of the regression model (Model 5), ANOVA table and Fisher's test (F) are used as shown in Table 8:

Table 8. ANOVA test for the fifth and sixth hypotheses

Significant Level	F Statistic	Degree Of Freedom	Model	
0.000	84/647	2	Regression	
		613	Rest	V
		613	Total	

As shown in the above table, the regression model is significant at the error level of 5% (P < 0.05). Consequently, the null hypothesis is rejected Model 5 has a significant effect on the future operating profit.

As the regression model is significant, the nullity of the coefficients β0, β1, and β2 which shows the model constantly, the refined economic value added, and economic value added, respectively, are tested in this section. Table 9 presents the regression model and the data used to test hypotheses:

Table 9. Coefficients of the regression model to test the fifth and sixth hypotheses

Significant Level	T Statistic	Standardized Coefficient β	UnStandardized Coefficient		Model	
			Standard Deviation	Coefficient Of Variable		
0.000	13/702		5492/337	75253/702	Fixed Variable	
0.000	8/550	0/325	1003/468	8579/521	$REVA_t$	II
0.000	6/317	0/240	901/160	5692/199	EVA_t	

Discussion

If any of the information items included in the financial statements affect the shareholders' decisions, it can be said that these items have information content. Therefore, if, in a study, the future operating profit can be included in a regression model as a dependent variable and its independent variable is one of the accounting items and indexes; we

can say that the accounting index has the information content when the changes in the model are followed by significant changes in the future operating profit.

These findings indicate that there is a significant and positive relationship between the refined economic value added and the future operating profit which is in line with the results of the study done by Basidor et al., (1997). As a result, it can be

said that the refined economic value added because of its information content for decision makers in the market has been able to establish a significant relationship with the future operating profit.

The results of testing the second hypothesis suggested that there is a positive and significant relationship between economic value added and the future operating profit. This corresponds to the findings observed by Machuga et al., (2002), Ferguson et al., (2005), Cheng et al., (2007), Shariat (2003), Noravesh and Mashayekhi (2004), Mahdavi and Rastegari (2007). On the other hand, this finding is contrary to the results of the study done by Nazari (2000).

Accordingly, it can be said that the economic value added because of its information content for decision makers in the market has been able to create a relatively less intense significant relationship with the future operating profit than the relationship between the refined economic value added and the future operating profit.

The third hypothesis concerning the information content of the current operating profit and its effect on the future operating profit was confirmed at 95% level of confidence. This validates the information content of the operating profit, which is corresponding to the results of studies done by Noravesh and Mashayekhi (2004), Mahdavi and Rastegari (2007).

The fourth hypothesis examined the cash from operations or in other words it compared cash dividends and the operating profit. It shows that there is a positive and significant relationship between cash from operations and operating profit.

An analysis of the fifth and sixth hypotheses suggested that the economic value added has incremental information content over the refined economic value added and vice versa. This was done for the first time in Iran.

Conclusions

The findings of this study indicated that the refined economic value, economic value added, operating profit, cash flow from operations are positively and significantly correlated with the future operating profit. Given the correlation coefficient and the adjusted coefficient of determination for the variables under study, it can be inferred that as there is a significant relationship between the independent and dependent variables, these variables can be used to predict other parameters used in

this study. Besides, it can be said that the current operating profit which is one of the accounting criteria for performance evaluation to account for more changes in the dependent variable (the future operating profit), thus, the refined economic value added and economic value added as the economic criteria for performance evaluation. In other words, the current operating profit has higher information content (greater predictive power) than the other two factors and is still considered as the most important accounting variable in financial and investment decisions for decision makers.

Suggestions

The following suggestions are provided to corporate managers, stock brokers, and investors:

Tehran Stock Exchange is recommended to take into account other criteria such as P/E, EVA, and REVA as the reporting requirements in order to make accounting information more prominent and to diminish the role of capital gains in investment decisions.

The planners of accounting standards in Iran are recommended to try to take advantage of all the international standards so that information credit such as EVA and REVA that arises from accounting data are upgraded.

Tehran Stock Exchange is advised to create a database to supply information such as EVA, REVA, the weighted average cost of capital, cash value added, and other information for applicants as such criteria can also be used by the stockholders to assess the level of wealth creation by companies.

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