Measuring economic value added and its comparison with other methods of evaluation of financial performance of management in state and private banks: A case study in Bank Saderat, Parsian Bank

Akbar Aminimehr, Fateme Fathee

Payame-nour University of Tehran, Iran

Abstract

A lot of efforts have been done to investigate ways of evaluation of financial performance of management. The purpose of this study is to determine the variable with high explanatory power of banks' market value. Then 4 variables included economic Value Added, Net Operating Profits after Taxes, EPS and P/E choice were selected as factors determining firm market value and review the market value of each separately between governmental and nongovernmental banks. In order to fulfill the objectives of the study Saderat bank have been selected as representative of the governmental banks and Parsian bank have been selected as representative of the nongovernmental bank and during the five-year period 2009-2011 were studied. Vuong Z- test is used to determine the best variable determining market value. The results indicate that the economic value added have greater explanatory power in comparison with the other three variables Net Operating Profits after Taxes, EPS and P/E in nongovernmental banks market value. Results indicate that Economic Value Added Compared with Net Operating Profits after Taxes can be more explained market value in governmental bank but Economic Value Added Compared with the other two variables EPS and P/E has less Explanatory power than the market value of the governmental banks.

Keywords: Economic Value Added, Financial Operation, Net Operating Profits after Taxes, EPS, P/E

Introduction

Economic value-added method was first created by Stern-Stewart to give consulting services to the institutions to determine suitable compensation level for their managers. Dr. Carl, the chief of Simon board said:" Economic value added eliminated the ambiguities of recognizing the multiple planning and created common language for all (from employee to top manager). He presented an exact criterion to evaluate the performance.

After the end of war, economical privatization was considered in Iran and great part of the stock of governmental companies of Iran was given to the public via capital market. The evaluation and pricing in the first stage and determining the basic price are challenging issues to start the transaction in capital market. This question was raised that how are later changes of stock price affected by inherent values of companies. Are the prices reflecting the inherent values of the companies and capital market could determine the price for the companies' values.

The evaluation of the performance of economic enterprises to be sure of optimized allocation of limited resources is of great importance. If suitable criteria are not used to measure the performance and stock value of the institution, the company value is not inclined to its real value and capital allocation is not done correctly.

In the present study, some of the effective factors of stock price changes in governmental and non-governmental banks were investigated. At first, we investigate the theoretical basics and review of literature, then the hypotheses and study method are discussed. Finally, the results and analyzed and research results are presented.

Review of literature

International studies

Athganassakos (2007, 1397,1411) achieved some evidences that the change in economic

added-value compared to the change in earnings explained great part of the fluctuations of stock return during 10 years and 5 years. He found that economic added value is an index considering the past performance and doesn't provide information about the future performance of the institution. In another study, Ghanbari (2007,7-22) investigated the strong relation between economic value-added and market value added in care manufacturing companies in India and achieved many evidences that economic value added is better than other traditional scales of performance and the best scale is the success of the company in increasing the value for stock holders investment. Irala (2007) considered this fact that whether economic value added has high prediction power compared to traditional performance as Return on Capital Employed (ROCE), Return on Equity, (ROE), EPS, Capital Productivity (KP) and Labour Productivity (LP). Thus, he used the data of 1000 Indian companies during 6-year. The results showed that economic value added had better prediction of market value compared to other scales and as it is applied for a short time, it is considered as a fundamental scale of company performance. Kyriazis and Anastassis (2007, 71-100) analyzed economic value added by some institutions in Athens stock market and found that although economic value-added is a useful performance tool, it is not related to stock holder value compared to other accepted accounting scales as net pro fit and operating earnings. Nogan (2008) evaluated whether positive economic value added leads in to stock price growth namely for the stock of bank companies and retailing and he observed that only in banking sector, the stock price depends upon economic value added. Huang, Wang (2008, 722-731) in a study evaluated a valuation model by which institution value is determined by book value, economic value added and intellectual capital. In this study, economic value added and intellectual capital were added to residual earnings of Olsen. But the results showed that residual earnings based on economical value added compared to residual earnings based on accounting accepted rules is not better in terms of explanatory capacity of the fluctuations in market value of the company. Kim (2009, 439-445) in a study to determine the explanatory power of stock return, investigated 6 performance evaluation criteria as (economic value added, adjusted economic value added, market value added and three criteria of traditional accounting). The results showed that adjusted value added and market value added were suitable criteria for evaluation of companies performance.

Local studies

Mahmoodabadi and Bayazidi (2008, 101-116) 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 explanatory power in determining the value of the companies. In another study, Vakilian *et al*. (2009, 111-122) investigated the relation between economic value-added and residual earnings as evaluation economic models with EPS. The results showed that there is a significant relation between residual earnings and future EPS and this criterion has prediction power. But there is no significant relation between economic value added and EPS. Thus, the claim of Stewart as economic value added is the best criterion of performance evaluation was rejected in Iran. It is better to use residual earnings as economical model of performance evaluation for investment decisions. Yahyazadefar *et al*. (2010, 113-128) evaluated the relation between two types of traditional performance evaluation criteria (return on equity, return on assets and EPS) and the criteria of evaluation of the value-based performance (economic value-added) with market value added. The results showed that there was a significant relation between economic value added and return on equity and market value added. But there is not significant relation between return on assets and EPS and market value added.

Main hypothesis

The private sector has more efficiency compared to the public sector.

Sub-Hypotheses

1. Valued added compared to net operating profit after taxes had more power to determine the financial performance of the banks.

2. Valued added compared to EPS had more power to determine the financial performance of the banks.

3. Valued added compared to P/E had more power to determine the financial performance of the banks.

The study hypotheses supported the results of the study of Stern and Stewart, Ghanbari, Irla and Nogan and believed that "economic value-added is the best variable in determining the explanatory power of market value of the institution and the best criterion of performance evaluation. The study hypotheses were inconsistent with the results of the study of Kyriazis, Athganassakos, Huang and want and their results as "other variables of performance evaluation compared to economic value added had more explanatory power of institution market value".

Variables of the study

Dependent variable: There is a dependent variable in the present study:

• Market value of the institution: It is equal to the sum of market value of equity and market value of its debts theoretically and this value is obtained at definite time of market". MV denotes market value. In other words, market value is the sum of liabilities value and stock market value of the institution.

$$V_F = V_D + V_E \qquad (1)$$

Where, V_F indicates market value of the institution, V_D liabilities market value, V_E equity market value. Equity market value of the institution is obtained of the multiplication of market value per share by the number of issued stocks.

Independent variable: The independent variables in the study are:

• Economic value added: it integrates the capital costs with financial statement information. Here the equations by which the economic value added is calculated is as:

$$EVA = NOPAT - (WACC * Capital) \qquad (2)$$

Where, NOPAT is net operating profit after taxes, WACC is Weighted average cost of capital and capital employed. This equation is explained extensively later.

Economic value added = net operating profit after taxes-Capital costs (3)

Net operating profit after taxes = Operating profit*(1-t) (4)

Capital costs = Weighted rate of capital costs*Capital employed (5)

Capital = long term capital+ current portion of long term debts + Stock holders equity employed (6)

• Net operating profit after taxes: The second independent variable is net operating profit after taxes and it is profit after tax from the operation of the institution in which the impact cash records is eliminated and tax saving of financing costs is deducted. It is denoted by NOPAT and during the computation of economic value added, the report of its calculation is defined. It also can be computed as:

Net operating profit after taxes = Net profit+ interest costs-tax saving of interest costs+ increase of capital equivalents (7)

• Price/Earnings per share: It is the third independent variable denoted by P /E. This ratio shows that the how much the investors pay for its purchase compared to earnings per share. This variable is dividing price per share by earnings per share and this data is obtained of the existing software in stock market.

Methodology

Population and sampling method
The population of the present study was Saderat and Parsian banks during 2007-2011. Based on the limited study population, total data were considered as sample.

Data collection and data analysis
For data collection regarding the determination of review of literature, library and attributive studies were used. The data were analyzed by Tadbirpardaz, Rahavard Novin, Financial data bank of the companies listed in TSE and the sites of central bank and TSE and by Excel software, information files were collected. To prepare the variables from Excel software and for data analysis, Eviews software was used. The study hypotheses were analyzed by Vuong Z test. The data of market value of the companies were extracted from website of TSE and Tadbirpardaz software. Other study variables were extracted by balance sheet data, profit and gain statement of the institutions.

Design of the study
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. The study methodology was retrospective. This is a descriptive-correlation study and it is inductive (from part to whole).

Data analysis method
The common method for selection of the best model is comparing the coefficient of determination (R2) and finally a model is selected with high R2. The problem of selecting this model is that it doesn't

consider the probable nature of the results. To determine the fact that which rival models can explain the value of market, Vuong Z-statistics was applied.

Vuong (1989) presented a statistical test to determine which of two models explained the dependent variable better. The difference between Vuong Z-statistics and other statistical tests is that in Vuong Z-statistics, the distribution of statistics to the probability without considering null hypothesis is based on actual values of two models. This test has explanatory power for both models but it shows which one of two models is close to the actual process of the data[1].

To test the study hypothesis, Vuong Z statistics was applied and in this test, a likelihood- ratio-based is presented for selection of rival models. If Vuong Z statistics:

a. It is positive, the first model is preferred to the second model.

b. It is negative, the second model is preferred to the first model.

c. It is zero, none of them are preferred[2].

To determine the equation of economic value added, net operating profit after tax, EPS, P/E with market value of the institution, four models were used and they are expressed in the form of four simple regression equations as equations (8) to (11).

$$MV_{it} = \beta_0 + \beta_1 (EVA_{it}) \tag{8}$$
$$MV_{it} = \beta_0 + \beta_1 (NOPAT_{it}) \tag{9}$$
$$MV_{it} = \beta_0 + \beta_1 (EPS_{it}) \tag{10}$$

$$MV_{it} = \beta_0 + \beta_1 \left(\frac{P}{E}\right)_{it} \tag{11}$$

Where,

MV_{it} : Bank market value i in year t

EVA_{it} : Economic value-added of bank i in year t

$NOPAT_{it}$: Net operating profit after tax of bank i in year t

EPS_{it} : Earnings per share of bank i in year t

$\left(\frac{P}{E}\right)_{it}$: The price to earnings per share of bank i in year t

β_0 : Intercept of regression line

β_1 : Gradient of regression line

Each of equations 8 to 11 besides the study sample, investigated the governmental and non-governmental banks separately.

Data analysis and Results

In this study, Vuong Z statistics was evaluated for total study sample and each bank separately and the results are shown in the table.

Hypothesis testing in total statistical sample by *Vuong Z model*

Vuong Z statistics was calculated for three study hypotheses at total stud y sample and the results are shown in Table 1.

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

No	Hypothesis	Statistics Z	P -value	Result
1	$(EVA > NOPAT)$	0.4062	0.006848	Supported
2	$(EVA > EPS)$	3.622	0.00034	Supported
3	$\left(EVA > \frac{P}{E}\right)$	-0.445569	0.006710	Rejected

Source: Researcher results

As the calculated values of Vuong Z statistics for the first and second hypothesis was 0.4062, 3.622 as significant and positive. This shows that economic value added compared to net operating profit after

[1] Genius, M., & Strazzera, E. (2000). Evaluation of likelihood Based Testes For Non-NetEd Dichotomous Choise. 1-31.

[2] Dechow, P.(1994). Accounting Earning And Cash Flow as Measures of firm Performance: The ROLE of Accounting Accruals. Journal of Accounting and Economics,3-24.

tax and EPS had more explanatory power of market value. As positive statistics showed the preference of the first model to the second model and in this study, the first model considered the relation of economic value added with market value and the second model considered the relation of market value of the institution with the other variable of the same hypothesis. Thus, Vuong Z statistics was supported in total statistical sample of the first and second hypothesis.

But Vuong Z statistics for the third hypothesis was -0.425569 and p-value was small (zero). Thus, Vuong statistics is significant. As the negative value of Vuong Z statistics shows the preference of the second model, in total study sample, in the third hypothesis, the second model is preferred to the first model. This shows that P/E compared to economic value-added determined market value more. In other words, the third hypothesis in total study sample is rejected.

Hypothesis testing in Saderat Bank by *Vuong Z model*

Vuong Z statistics was calculated for three study hypotheses at Saderat Bank and the results are shown in Table 2.

Table 2. The results of study hypotheses test in Saderat Bank

No	Hypothesis	Statistics Z	P -value	Result
1	$(EVA > NOPAT)$	1.621	0.001727	Supported
2	$(EVA > EPS)$	-3.452516	0.000748	Rejected
3	$\left(EVA > \dfrac{P}{E}\right)$	-3.138657	0.002097	Rejected

Source: Researcher results

As the calculated values of Vuong Z statistics for the first hypothesis was 1.6221 as significant and positive. This shows that economic value added compared to net operating profit after tax had more explanatory power of market value. As positive statistics showed the preference of the first model to the second model and in this study, the first model considered the relation of economic value added with market value and the second model considered the relation of market value of the institution with the other variable of the same hypothesis. Thus, Vuong Z statistics was supported in Saderat Bank of the first hypothesis.

But Vuong Z statistics for the second and third hypotheses was -3.452516, -3.138657, respectivly and p-value was small (zero). Thus, Vuong statistics is significant. In these two hypotheses, the first model considered the relation of economic value added with market value and the second model considered the relation of independent variable of the hypothesis and market value of the institution. As the negative value of Vuong Z statistics shows the preference of the second model, in Saderat Bank, in the second and third hypotheses, the second model is preferred to the first model. This shows that EPS and P/E compared to economic value-added determined market value more. In other words, the second and third hypotheses in Saderat Bank are rejected.

Hypothesis testing in Parsian bank by *Vuong Z model*

Vuong Z statistics was calculated for three study hypotheses at Parsian bank and the results are shown in Table 3.

Table 3. The results of study hypotheses test in Parsian bank

No	Hypothesis	Statistics Z	P -value	Result
1	$(EVA > NOPAT)$	2.2287	0.00243	Supported
2	$(EVA > EPS)$	0.278706	0.007807	Supported
3	$\left(EVA > \dfrac{P}{E}\right)$	0.173204	0.008626	Supported

Source: Researcher results

As the calculated values of Vuong Z statistics for the first, second and third hypotheses were 2.2287, 0.278706, 0.173204, respectively as significant and positive. This shows that economic value added compared to three variables of net operating profit after tax , EPS and P/E had more explanatory power of market value. As positive statistics showed the prefer- ence of the first model to the second model and in this study, the first model considered the relation of economic value added with market value and the second model considered the relation of market value of the institution with the other variable of the same hypothesis. Thus, Vuong Z statistics was supported in Parsian bank sample of the third hypothesis.

Conclusions

The present study aimed to determine the variable with more determination power of the market value of the banks. To fulfill the aims of the study, based on the governmental and non-governmental banks, Saderat bank as the representative of governmental banks and Parsian bank as the representative of private banks were chosen during the 5-period 2007-2011. Four variables of economic value-added, net operating profit after tax, EPS, P/E were considered as the variables determining the market value of the institution and the relation of each one with the market value was separately evaluated in governmental and non-governmental banks.

The empirical evidences of the study showed that in non-governmental banks, economic value added compared to three variables, net operating profit after tax, EPS and P/E had high explanatory power of market value. These results were consistent with the results of Stern and Stewart, Ghanbari (2007), Irala (2007) and Nogan (2008) and were inconsistent with the results of Kyriazis, Anastassis (2007) and Huang and Wang (2008). The results showed that in governmental banks, economic value added compared to net operating profit after tax had more determination power of market value. The results of comparing these two variables in governmental banks were consistent with the results obtained by the followers of economic value added. But economic value-added compared to two other variables, EPS, P/E had low explanatory power of market value of the institution in governmental banks. These results were inconsistent with the results of the followers of economic value added and consistent with the opponents of economical value added. While both groups of management and stock holders are concerned about the stock price, the present study presented a clarified method to the financial decision makers that the stock holders can take decision well before purchasing the stock.

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