Studying the Relationship between the Refined Economical Value Added and Earning Per Share and Price /Earning Ratio in Tehran Stock Exchange

Mansour Garkaz[1*], Mahmoud Hematfar[2], Daryoush Javid[2], Hassan Farajpoori[2]

1- Department of Accounting, Aliabad Katoul Branch, Islamic Azad University, Aliabad Katoul, Iran
2- Department of Accounting, Borujerd Branch, Islamic Azad University, Borujerd, Iran

Corresponding Author Email: iran8878@yahoo.com

Abstract

The research is aimed at studying the relationship between the refined economical value added (REVA) and earning per share (EPS) price/earning ratio (P/E). In the current research, the relationship between the refined economical value added and performance ordinary criteria including EPS and P/E has evaluated using data obtained from 50 firms in stock exchange bourse during 2006-2010. The obtained results suggested that there isn't any significant relationship between refined economical value added and EPS and P/E. Although the correlation wasn't confirmed by the statistical analysis, but this doesn't mean that there isn't any significant relationship between the research variables. The correlation and determinant coefficients percentages suggest that there is only a weak relationship between the refined economical value added performance ordinary criteria including EPS and P/E. however, the correlation between REVA and P/E is stronger than the correlation between REVA and EPS.

Keywords: refined economical value added (REVA), earning per share (EPS), price/earning ration (P/E), market valued added (MVA).

Introduction

Nowadays, wealth creating for stockholders is considered as a main goal for commercial entities. Economical value added is one of the most common criteria's for measuring wealth creating for stockholders which is originated from 1954 by Sojanen (Sojanen,1954) and introduced formally as balanced interest in 1965 (Kang, 2002). Economical value added subtracts the opportunity costs of all used resources from the net operational interest. In other words, negative economical value added shows resources and stockholders' wealth losses (Stewart, 1991). Although economical value added uses more reliable information, but this information is not necessarily related. In other words, economical value added computes the resources opportunity costs based on book value. The financial specialists presented a modified form of economical value added called "refined economical value added" for solving this problem which depends on data relationship rather than reliability. In other words, this criterion computes the resource opportunity costs in accordance with the market value (Bacidore, 1997& Bausch, 2003). Therefore, the current research tries to evaluate the power of these criteria to explain earning per share and P/E. Many of performance criteria are based on accounting model specially reported accounting interest model. Gradually, managers have considered interest management through accounting numbers in order to maintain and improve award level. This why some companies with suitable financial status for accounting numbers and performance criteria faced to financial problems such as lack of balance. Therefore, the performance measuring criteria based on accounting models and award plans couldn't move in direction of stock holders and intra organizational groups (Hiss & Phan ,1991).

In order to remove the problems of performance measuring models originated form accounting information, researchers such as Sojanen (1954), Stewart (1991), Bacidore (1997) and Bausch (2003) have

tried to present a new criterian for performance measuring. The appearance of some theories in economical interest or balanced interest resulted in suggesting some models for computing the economical interest (Stewart, 1991). In these models, having computed tax and capital costs, the operational net interest was defined as the economical or balance interest. The main goal of economical entities is to maintain and improve the stockholders' wealth, and wealth creation is the only way for them to achieve this goal. Therefore, the economical value added is a main factor to improve the stock value as well as improve the wealth of stockholders (Bacidore, 1997). These criteria try to consider the managers behavioral complications to evaluate their performance and explain the information existed about stock's price and efficiency (Bausch, 2003).

Literature

Milonovich and Tesouie (1996) have studied the relationship between the market value added and performance measuring criteria in computer industry. Their performance criteria included: economical value added, ratio of earning per share to growth of per share, and stockholders efficiency. Among these, the economical value added had the most significant relationship with the market value added. The reported Ra for economical value added was %42, growth of earning per share was %34, and the reported Ra for earning per share and stockholders efficiency was %39. Daud and Johns (1999) have compared the companies which accepted the economical value added with other companies. Their sample included 88 Americans in which 37 ones accepted the economical value added. A questionnaire including information about the companies and their accounting and financial system features has been delivered to each company. Data analyzing revealed that the companies which haven't used the economical value added have frequently used criteria such as interest margin, market efficiency, investment efficiency, and sell efficiency. Both groups have used non-financial criteria such as time considerations, reliability capacity, responsibility, usability, and adoptiveness. The award contract in the second group was mostly based on investment efficiency rate and sell efficiency rate. Peixto (2002) has studied the content of economical value added to explain market value added changes in a sample including 39 Portuguese firms during 1995-1998 and compared it with the informational content of net and operational interest. The obtained results suggested that the net interest be the most powerful criteria for explaining the market value added changes, but the relationship between the economical value added and market value added was significant. Bausch (2003) in a research with subject of "whether the residual interest based on market value is a better criterion for performance measuring than residual interest based on book value' present in European congress (2003), have studied theses two criteria. The obtained results suggest that the refined economical value added result in lower investment in projects with negative current net value. Jefri Bacidore (1997) was the first one to develop refined economical value added model in accounting research. Bacidore (1997) have studied the relationship between the economical value added and refined economical value added with stocks unmoral efficiency in a sample including 600 American firms during 1982-1992. They evaluated this question that what relationship between the economical values added and refined economical value added and value creating for stockholders exists. The obtained results suggested that both factors have a positive relationship with unmoral efficiency and this relation is significant in significance level of a=0.01. Also the refined economical value added is stronger for predicting the unmoral efficiency. Therefore, the refined economical value added has better performance in explaining unmoral efficiency changes. Talebi, jalili (2002) have studied the relationship between the economical value added and accounting interest with the stock efficiency in firms accepted in stock exchange bourse during 1997-98. Their results showed that the accounting interest has a significant relationship with the stock efficiency while there isn't any significant relationship between economical value added and stock efficiency. Davarifar (2004) has studied the relationship between the economical added value and assets efficiency rate and stockholders salary efficiency in non-metallic mineral industries accepted in Tehran stock exchange bourse during 1997-2002. The obtained results showed that there isn't any significant relationship between the economical value added and the other two variables. Shariatmadari and Nahandi (2005) have studied the relationship between the refined economical value added and modified stock efficiency in accordance with risk rate. The obtained results suggested that there is a weak relationship between these two variables.

Performance Evaluation Models

Financial reports users use different criteria for evaluating firms' performance. The several performance methods can be generally divided into two categories called accounting and economical models:

Performance Evaluation Accounting Model

The financial reports are the results of accounting information system in which the reported interest is very critical for users. Investors evaluate the firms performance using the information related to accounting interest and make predictions based on it. Managers also use accounting interest for future programming.

In performance evaluation accounting models the firms value is a product of firms' interest and a interest-value converting coefficient. In this model, the firm value is a function of several criteria such as earning per share, earning growth rate, stockholders salary efficiency, investment efficiency, free cash flow, and dividing earning (Stewart,1991).

Earning growth: earning growth is considered as a criterion for determining the firms future earnings. In this method, the accounting interest is determined considering the stock market price which shows the market predictions and expectations for the future earning of a firm.

Earning per share (EPS): this criterion is based on the accounting interest.

Interest dividing: most firms divide a considerable part of their earned interest between stockholders for two main reasons. Such firms haven't profitable investing plans or can provide their external resources for investing. Interest dividing is reasonable in case of disability to investing in profitable projects.

Free cash flow: free cash flow is some of cash flow which doesn't have any effect on firms' profitability power if divided between stock holders.

Performance Evaluation Economical Model

Researchers tried to remove the problems of models depending on accounting numbers in order to modify the traditional performance evaluation criteria. So the economical models have introduced for performance evaluation. In economical models, the firm value is a function of profitability power, existing preferences, potential investments, and the difference between the efficiency rate and firms investment costs (Rastegari,2006 & Bausch, 2003). Among different measuring concepts, the balance interest was introduced in recent years. Using book values and market value for determining interest and investment costs resulted in significant difference between obtained results. Generally, this concept is based on the following measures:

Economical value added: this is equal to interest amount after subtracting from all costs such as investment costs and considered as one of the most important performance evaluation criterion by Stewart (1991).

Refined economical value added: the interest is measured based on book value and the investment cost is measured based on the market value. Despite the advantages of economical value added, it seems that it has its own problems. Its dependence on historical figures is one of the most important problems.

Residual economical interest: it is one of the other economical interest models in which the interest and investment costs are measured based on the market value (Bausch, 2003).

Despite the other two criteria, this one is completely based on market values. The theoretical base of these models is fully economical and originated from economical interest concept. It is resulted from the subtraction of investment costs based on market value from economical interest.

Refined Economical Value Added and Its Applications

The refined economical value added has two advantages over the economical value added: when the refined economical value added is positive, the additional value will be created for stockholders proportional to opportunity cost based on market. In this case, the flow operational interest is more than investment real opportunity cost for investors in the end of period. This is not always the case for economical value added, since it is possible that while the investors' efficiency is lower than real opportunity costs, again the economical value added is positive. Second, refined economical value added can be computed based on entire interest flow for investors (stockholders debts and credits) or only based on interest flows for stockholders salaries. This feature only is the case for economical value added when the dept market value and stockholders salary is equal to economical book value (Bacidore, 1997).

Refined Economical Value Added Commuting Method

Bacidore (1997) have defined refined economical value added as remained net interest after subtracting the ratio of investors' opportunity costs to market value from the net operational profit adjusted tax. The Refined economical value added (REVA) is considered as the independent variable in this research. The following formula is used to compute REVA (Bacidore , 1997):

$$REVA_T = (NOPAT_T - WACC(ncapital_{T-1}))$$

Where:

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NOPAT: Net operating profit After Adjusted Taxes T period
WACC: weighted average cost of capital
Mcapital: the market value of firm total capital in the first period
The computation of NOPAT based on operational procedure is as follows:

Increase in capital equivalents includes the increase and reduction of assets values, increase in the reduction storage of investments value, increase in storage of doubtful credits, increase in storage of pending costs and increase in storages of employees' retirement advantages (Kavoosi, 2002).

Also tax defined as follows for NOPAT:
Tax= operational profit x tax effective rate

The tax effective rate is considered in accordance with 2001 law and %10 tax discounts for firms accepted in bourse. The effective tax rate is %22.5 (Dvani, 2002).
WACC is used for computing capital cost as follows:

$$WACC = (W_{\alpha} \times K_{\alpha}) + (W_e \times K_e)$$

Where:

W_D: Dept weight

W_E: Stockholders earning

K_D: Dept cost rate

K_E: Ordinary stockholders earning

The financing resources cost is as follows:
a) Dept cost rate

K_D = dept rate * (1-T)

b) Ordinary shares cost rate , cumulative and savings
c) Deduced cash flow (DCF) method is used for computing ordinary shares cost rate , cumulative and savings :

$$K_E = \frac{D_0(1+g)}{p_0} + g$$

Where:

D_o: Cash profit per share in current period

P_o: Price per share

g: share profit growth rate considering relative stability of profit commutation ratio, special value efficiency, and growth rate:
Profit commutation rate= undivided profit per year/ net profit in that year
g=ROE* profit commutation rate
The financing resources weighs are computed as follows:
The weight of each resource is obtained from dividing its market value on total market values of all resources. Considering that dept, market value is nearly equal to their book value, so their book value is used.
Total resources = ordinary shares market value + book value of profit depts.
Therefore, the weigh of each resource is computed as follows:
WD (with profits depts. Weight) = book value of utilizing depts. / total resources value
WE (ordinary, cumulative, and save share weight) = ordinary shares value/ total market value
Firm's capital market value is computed as follows:
Mcapital = (non profit current debts − book value of all debts)+ (share market price in first period + share number)

As it can be seen from the above formulas, the main difference between the refined economical value added and economical value added is that in the later one uses v share market price in first period for instead of economical value for determining capital cost. Moreover, the firm value is originated from the used physical assets and its strategy for potential and current opportunities.

These values are in scope of high executive mangers, so the firm market value is a key index in REVA including both physical assets and opportunity and strategies values, while firms' economical book value as an important parameter in EVA only includes used assets value. Therefore, executive management tries to

maximize firm market value by providing strategies and utilizing the current and future opportunities in order to value creating, while the operational management tries to maximize firms market value by optimized application of used physical assets. Therefore, REVA is a better measure for performance evaluation in granting awards for high managers.

Research Hypotheses

Two hypotheses are provided for reaching research goals:

First hypothesis: there is a significant relationship between the refined economical value added and earning per share.

Second hypothesizes: there is a relationship between the refined economical value added and P/E.

Data Analyzing and Hypotheses Test

The initial data has been inserted in Excel software in order to obtain the required variables of both hypotheses. Descriptive statistics of research variables including mean and standard deviation as well as correlation test including correlation coefficient and linear regression were used for data analyzing.

Statistical Population

The statistical population of this study includes all firms accepted in stock exchange during 2006 to 2010.

Results

Descriptive Statistics

Data should be described before data analyzing in order to further understanding of variables. The descriptive statistics is performed to determine the data pattern. These statistics include: mean (center index) and standard deviation (scattering index), REVA, EPS, P/E of about 50 firms accepted in stock exchange during 2006-2010, and are present in tables 1, 2, and 3.

Table 1. Descriptive Statistics of REVA Per Year (Independent Variable)

Profit Management	Mean	Standard Deviation
2006	14800	64160
2007	5419	00
2008	5491	056
2009	805	636
2010	6069	4400

Table 2. Descriptive Statistics of EPS Per Year(Dependent Variable)

Profit Management	Mean	Standard Deviation
2006	736	1095
2007	708	104
2008	655	1153
2009	64	1187
2010	560	1056

Table 3. Descriptive Statistics of P/E Per Year (Dependent Variable)

Profit Management	Mean	Standard Deviation
2006	4.6	3
2007	5	3.8
2008	4.8	4.6
2009	4.8	6.6
2010	9	5.5

Hypothesis Analyzing
First Hypothesis Test
First hypothesis: there is a significant relationship between the refined economical value added and earning per share
The null and alternative hypotheses are defined as follows:
H0: there isn't any significant relationship between the refined economical value added and earning per share
H1: there is a significant relationship between the refined economical value added and earning per share.
The linear regression results for the relationship between the refined economical value added and earning per share are presented in table 4.

Table4. Correlation Coefficients between the Refined Economical Value Added and Earning Per Share

Profit Management	Correlation Coefficient	Modified Determination Coefficient	P-value
2006	0.07	.006.	0.59
2007	0.06	0.54	0.67
2008	0.05	0.003	0.69.
2009	0.04	0.00	0.74
2010	0.015	0/0	0.99
2006-2010 (5 years Period)	0/0	0.003	0.67

Since the probability value is larger than 0.05 for all years, there's no reason to reject H0. Therefore, there isn't any significant relationship between the refined economical value added and earning per share. The correlation coefficient ranges from 0 to 1. The more the coefficient is, the more the correlation between two variables. If it becomes zero, there is no correlation between two variables. As it can be seen from table 5, the values are near /zero in entire 5 years, therefore there isn't any significant relationship between the refined economical value added and earning per share.

Second Hypothesis Test
Second hypothesis: there is a relationship between the refined economical value added and P/E.
The null and alternative hypotheses are defined as follows:
H0: there isn't any significant relationship between refined economical value added and P/EPS.
H1: there is a significant relationship between refined economical value added and P/EPS.
The linear regression results for the relationship between refined economical value added and P/EPS are presented in table 5.

Table5. the correlation coefficients for the relationship between refined economical value added and P/EPS

Profit Management	P-value	T.Statistics	Standard Coefficients	Non-Standard Coefficients		
				Estimation Errors	Value	
2006	0.1	1.6	-	113000	1870000	a
	0.59	-0.53	-0.07	856	-461.4	b
2007	0.09	1.7	-	39361	670065	a
	0.67	-0.4	-0.06	315	-13.5	b
2008	0.07	1.8	-	345664	6061	a
	0.68	-0.41	-0.05	60	-107	b
2009	0.004	3	-	97416	95363	a
	0.74	-0.3	-0.04	7.5	-3	b
2010	0.1	1.6	-	37685	587867	a
	0.91	0.1	0.01	314	34	b
2006- 2-10	0.03	-	-	177000	3805000	a
	0.67	-0.4	-0.05	85	-119	b

Considering the degree of probability value in Groph- Smirnoph test which is more than 0.05, H0 is accepted , so the error terms are distributed normally. In the 0.95 confidence level with 0.05 errors, the data are normal.

Data normality is confirmed with the curves provided in the figures 1 to 3.
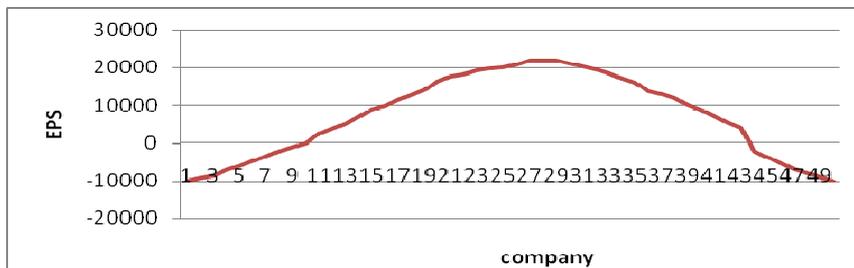

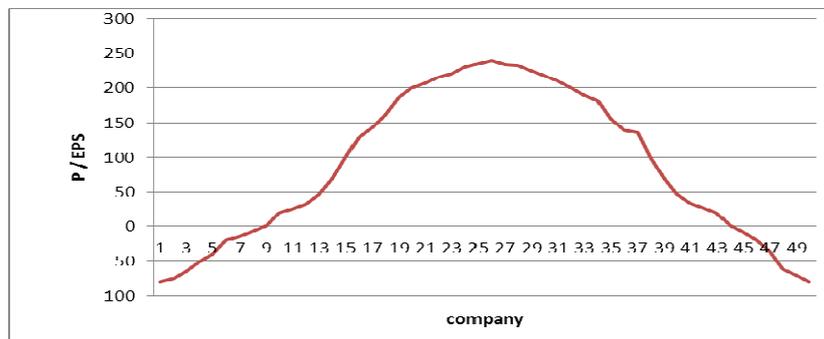Figure 1. Data Normality

Figure 2. Data Normality (EPS)

Figure 3. Data Normality (P/EPS

There is no relationship between the refined economical value added and P/E. The curve of refined economical value added and P/EPS for period of 2006-2010 also confirms these results. As it can be seen from the figures 4 to 9, there is no linear relationship between the refined economical value added and P/EPS.
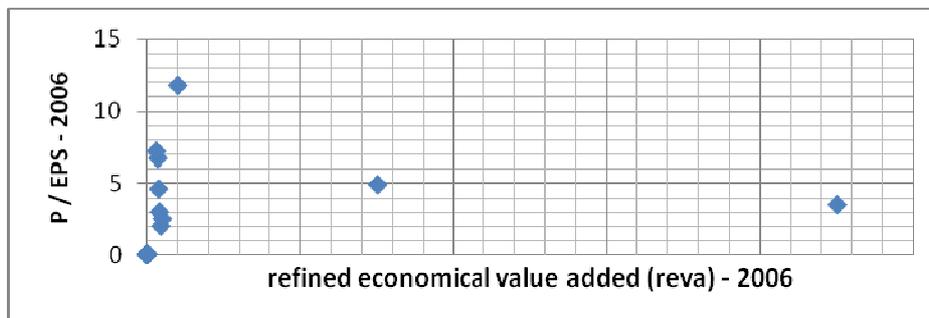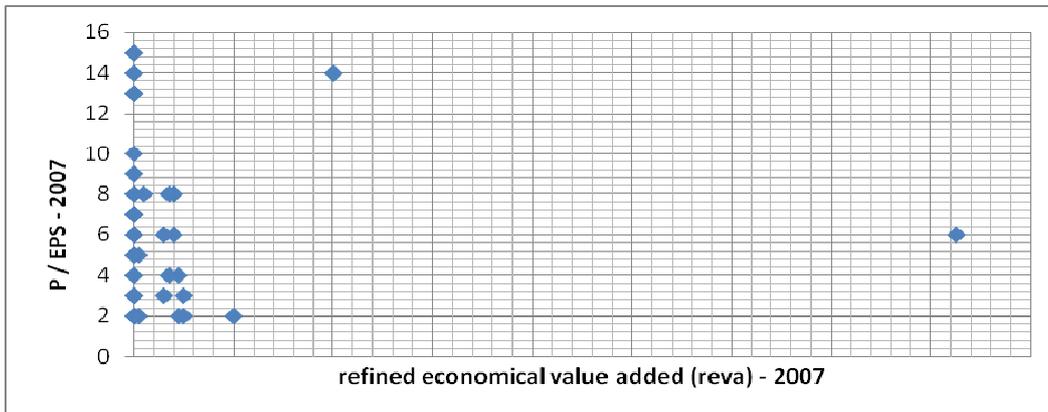
Figure 4. linear relationship between the refined economical value added and P/EPS in 2006

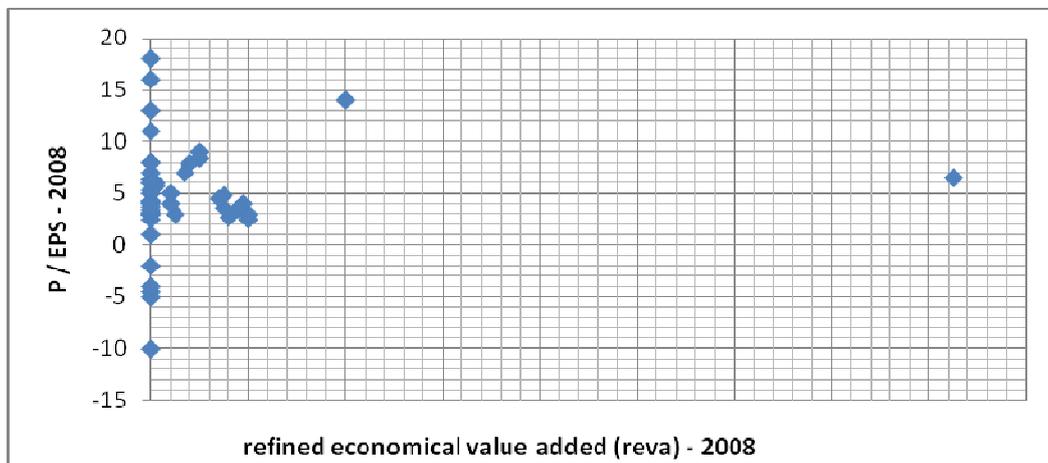Figure 5. linear relationship between the refined economical value added and P/EPS in 2007

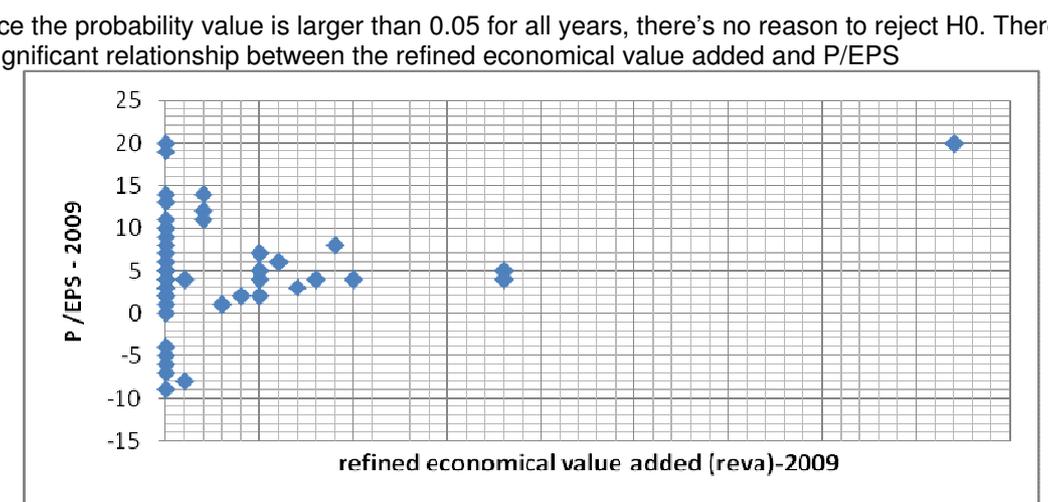Figure 6. linear relationship between the refined economical value added and P/EPS in 2008

Since the probability value is larger than 0.05 for all years, there's no reason to reject H0. Therefore, there isn't any significant relationship between the refined economical value added and P/EPS

Figure 7. linear relationship between the refined economical value added and P/EPS in 2009
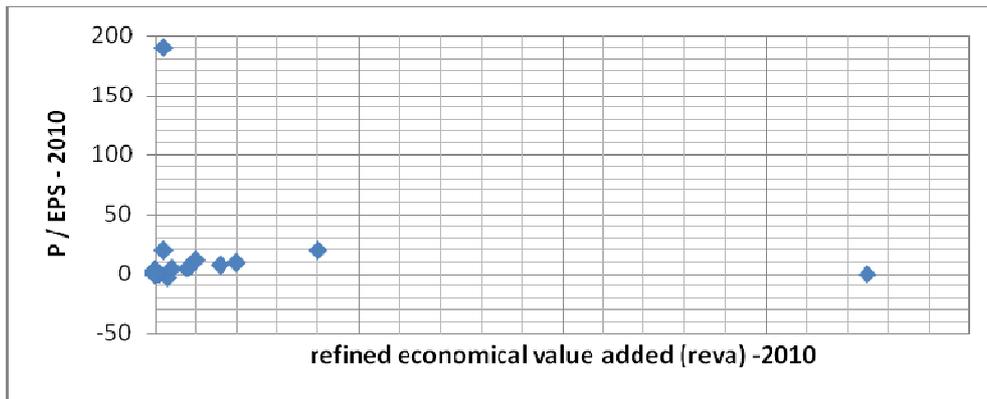
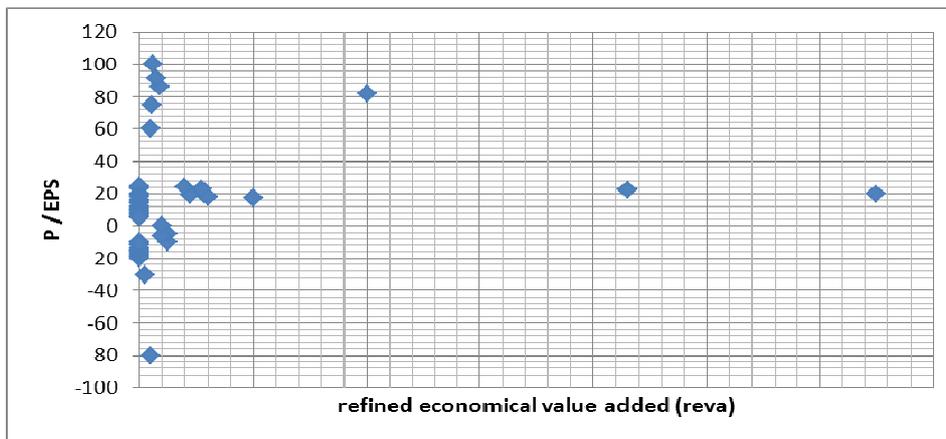Figure 8. linear relationship between the refined economical value added and P/EPS in 2010

Figure 9. Linear relationship between the refined economical value added and P/EPS

Discussion and Conclusion

The refined economical value added (REVA) shows the additional profit gained by the firm after covering the investors opportunity cost for capital market value from net operational interest adjusted tax. The results of hypotheses tests showed that there isn't any significant relationship between the REVA and EPS and P/EPS. This means that there isn't any statistical relation but there may be some relationships between the above mentioned variables.

Statistically, the author couldn't reject H0 and accepted it with error rate 0.05. The correlation coefficients and determination factor showed that there is a weak relationship between the refined economical value added and common criterion for performance evaluation. Therefore, it can be concluded that using each criterion can result in different results. The obtained results are in line with results obtained by Bacidore (1997) fergosen and Leistikow, (1998).

The results for significant relationship between the PPS and economical added value are the same as theory (2003) for material producer companies accepted in Tehran bourse (1993-98). Also, the results showed that there isn't any significant relationship between the REVA and EPS and P/E and EPS which is consistent with Shariatmadari and Nahandi (2005).

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