

STUDY OF THE RELATION BETWEEN ECONOMIC ADDED VALUE AND COMPANY MARKET VALUE AND DPS IN THE COMPANIES CALCULATED IN INDEX OF FIFTY MOST ACTIVE COMPANIES AT TEHRAN STOCK EXCHANGE

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ABSTRACT

Herein this study, economic added value has been regarded as a criterion for recognition of operation level. In order to define economic added value, the assumption is to maximize interests of stockholders and managers. Thus, the said criterion may be used for assessment of level of commitment and efficiency of managers. Thus, if this pattern is used by stockholders, they will become aware of efficiency level. Moreover, the said criterion calculates earnings of companies. Consequently, it is suitable for recognition of efficiency level of companies and its effects on DPS and value of a company where manager decides on the same will be observed.

In this paper, the relationship between economic added value and market value of a company and DPS of the companies, calculated in index of fifty most active companies at Tehran Securities and Exchange Organization from 2007 to 2011 has been studied. The results indicate that there is no meaningful relationship between DPA and economic added value while there is a meaningful relationship between economic added value and market value of a company. Thus, economic added value is a more desirable criterion to predict market value of a company.

Keywords: Economic Added Value, DPS, Market Value Of A Company, Index Of Fifty Most Active Companies

JEL Classification: G1, G10, G19, N25, P34

INTRODUCTION

If presenting economic information, accounting and financial reporting is done desirably, it shall help the society to allot their economic references in the most efficient form.

On the other hand, inappropriate reporting and accounting, waste and shortage hide efficiency and eventually, it prevents logical economic allotment. Validation of financial statements means creating assurance about desirability of presentation and reliability of the said statements (Arbab Solaimani and Nafari- 1992). Accounting profit reflects financial and

operation status of a company by fully observing the concept of conservativeness and past-looking view while economic profit pays too much attention to expectations, related to the future. Assuming that accepted principles and standards of accounting are fully observed, but, accounting profit and interest of each stock enjoy great ability of being manipulated i.e. the said profit may be adjusted using various methods of cost and industrial accounting, for this purpose, investors and stockholders, in particular, do need certain criteria by which they may precisely assess operation of the manager of a company and observe its effect in market value of the company. Investors always seek for fresh opportunities for investment, achieving expected investment return. In many cases, investors continue seeking for other alternatives for investment until they become sure about logical future return in the company or further expected profit of the company is not low. Thus, one may declare that the companies, which sustain losses or those that make a little profit, are not interested by potential investors, who seek for achieving logical return from investment. Thus, the managers, who are seeking for fulfillment of satisfaction of investors, must act upon management of sales cost, expenses and economic value of their company in order to achieve least expected return. On the other hand, managers are obligated to create value for maximizing wealth of existing stockholders of the company.

Otherwise, not only wealth of stockholders is not increased, but, they will sustain losses. Thus, relying on above items, one may come up with this conclusion that making smart trading decisions depends on comprehensive information on sales cost and expenses (Baghoomian- 2005- pages 8-9). negative relationship between the variables and the market value (Kazemi, Z., & Kazemikhasragh, A. 2013).

RESEARCH METHODOLOGY

In this research, analogical-inductive approach has been used. In analogical method, theoretical studies have been done on realized changes in order to calculate respective variables, based on desirable methods. Then, in inductive method, the meaningfulness of the relationship between these variables i.e. economic added value as a dependent variable and DPS and company market value as dependent variables.

Through library studies, theoretical fundamentals of research and research literature have been compiled in order to find foreign researches done in connection with the subject of research; certain searches have been done through internet, magazines and foreign journals. Moreover, the researches, associated with the subject of this research have been studied through magazines, articles and domestic theses. Financial information of companies have been extracted from financial statements and notes of the companies, accepted at Securities and Exchange Organization during a five-year period in 2007, 2008, 2009, 2010, and 2011.

Notes to financial statements have been used for adjustments, related to accounting profit and stockholders' equities in order to achieve CAPITAL and NOPAT.

The said data consists of balance at the end of period, periodical increase and decrease of equivalent capital reserves (investments value deduction value, stock value deduction value, bad claims reserve, pension reserves and delinquent reserves).

In order to designate price of each stock, respective prices at the end of period has been used. Moreover, for DPS of each stock and number of companies, accepted at securities and exchange organization, the information available in five-year financial statements has been used. In order to analyze relations, first, the most desirable regression model with one

variable, of linear, second grade or reverse type, must be determined. In order to do so, SPSS software has been used for study of data in order to designate the most suitable model based on determining coefficient and optimized meaningful level.

After determination of type of equation, in order to estimate a model based on which the relations between dependent variables and dependant variables is designated for the entire five-year period, Panel Data Method shall be used. In this method, the data of the said five-year is combined (In order to estimate this model, Eviews software has been used).

Thus, research method is of correlation type and research methodology is of post-even type (by the use of past information). The respective statistical population of this research includes all companies, whose names have been given in the list of companies, accepted by securities and exchange organization during the research period and their stocks have actively been transacted. Thus, the companies of which transactional symbols have been stopped and/or their stocks have not transacted from 2007 to 2011 (the years subject of study) due to any reasons whatsoever, are omitted from the said population. Thus, 284 companies have been designated as statistical population. In any research, this question is put forth: “what is the size of sample”? Selecting a sample, larger than that is required for obtaining required results shall waste resources. Moreover, selecting very small samples mostly lead researchers to the results, which are of no scientific use. Thus, determination of the size of the sample, required for this purpose, is of great importance. On a whole, designation of size of the sample is related to data scale in such a way as they are divided based on quality and quantity and estimating average and success proportion, various methods have been used in order to designate size of the sample.

Respective data with relative scale and distance is among data which accepts average. In this type of data, in order to designate size of sample, average distance estimation method is used. If sampling is done discarding layout of a limited society number of sample is obtained using the following formula (Azar and Momeni- 2004):

$$n = \frac{N \cdot \frac{Z_{\alpha/2}^2 \cdot \sigma_x^2}{2}}{\varepsilon^2 (N-1) + \frac{Z_{\alpha/2}^2 \cdot \sigma_x^2}{2}}$$

where

N: Size of statistical population, n: size of sample, σ_x^2 : variance of the population, ε^2 : estimation error and $Z_{\alpha/2}^2$: normal distribution across α error. N equals to 284 companies, $Z_{\alpha/2}^2$, estimation error is 5%, which equals to 1.96.

Awareness about the quantity of σ_x^2 for replacement in the said formula is inevitable. In order to calculate σ_x^2 , from among existing methods, a preliminary sample statistical population has been selected. Using standard deviation, calculated for selected sample companies, available in CD of the Exchange Organization, preliminary sample variance has been calculated by the help of Excel Software in order for the result to be used as an estimation of σ_x^2 . The result was $(20.794)^2$. Inserting the respective figures in the aforesaid formula, we could obtain the number of sample as follows:

$$n = \frac{284 \times (1.96)^2 \times (20.794)^2}{(284-1)(5)^2 + (1.96)^2 \times (20.794)^2} = 53.99 \approx 54$$

In this research, 50 companies, from those, which have been accepted by Securities and Exchange Organization, were selected. In order to select the sample, classified and simple random (without replacement) were used. For this purpose, the companies, which have been accepted by the Exchange Organization, were divided into certain categories and from among each category, respective companies were selected as random. The subject domain of the research was to study the meaningful relationship between economic added value with DPS of each stock and company market value accepted by Securities and Exchange Organization.

The location domain of this research covered all companies, accepted by Securities and Exchange Organization. The said research was conducted in a five-year period, started on March 21, 2007 and ended on March 20, 2011.

Four means for collection of data and information, measurement means, used herein this research were respective documents (such as CDs of the Exchange Organization, CD containing the information of Exchange Services Company, Internet, and magazines). In order to study the meaningfulness relationship between economic added value with DPS and company market value, one-variable regression model has been used.

RESULTS

Testing Hypotheses using Panel Data Method

Test for assessment of data normality: One of the fundamental hypotheses in regression is that the dependent variable is normal. Thus, prior to estimation of regression, it is necessary to test this hypothesis on these variables. K-s Test was among the most well-known tests for assessment of data normality. In this test, H_0 and H_1 are as follows:

H_0 : Data are normal.

H_1 : Data are not normal.

Whenever meaningfulness level (sig.) of this test is higher than $\alpha=5\%$, we can say that H_0 is confirmed. It means that data are normal. According to Table 1, (sig) for price (p), the said level is higher than 5% only in 2007 and for the rest of the said years, the same is less than 5%.

Consequently, not only H_0 in 2007 has not been rejected, but also it is rejected for the rest of the said years (it means that data are normal only in 2000 and they are not normal for the rest of the aforesaid years). Concerning the fact that company market value doesn't enjoy normal distribution, one of the methods used for normalization of data is to use of different conversions on respective abnormal variable. For example, square rooting, logarithm conversion, etc are among the said methods. Price logarithm has been used for the data of this research. Because according to Smirnov Kolmogorov Test

using logarithm conversion, price has been normalized (Meaningful level of price has been $> 5\%$, therefore, H_0 has been rejected). Considering DPS, since their meaningful level of the same is $> 5\%$ during various years, therefore, H_0 has not been rejected and data is normal.

Table 1. Smirnov Kolmogorov Test

			Year	P	DPS	Ln(P)
2007	No.	mean	50	50	50	50
	a, b Normal parameters	Standard Deviation	7630 . 95	979 . 24	8 . 6257	
		The highest limit	5936 . 911	958 . 824	. 83984	
	Differences	Absolute value	. 135	. 154	. 076	
		Positive	. 135	. 124	. 062	
	Smirnov Kolmogorov Test	Negative	– . 132	– . 154	– . 076	
		Significance level corresponding (two ranges)	1 . 013	1 . 139	. 566	
			. 257	. 149	. 906	
2008	No.	mean	50	50	50	50
	a, b Normal parameters	Standard Deviation	9107 . 73	1092 . 00	8 . 6563	
		The highest limit	9501 . 516	1077 . 843	. 98391	
	Differences	Absolute value	. 228	. 155	. 067	
		Positive	. 228	. 105	. 056	
	Smirnov Kolmogorov Test	Negative	– . 197	– . 155	– . 067	
		Significance level corresponding (two ranges)	1 . 708	1 . 164	. 503	
			. 133	. 962		
2009	No.	mean	50	50	50	50
	a, b Normal parameters	Standard Deviation	9772 . 48	1245 . 34	8 . 4307	
		The highest limit	15316 . 323	1346 . 785	1 . 15529	
	Differences	Absolute value	. 297	. 178	. 125	
		Positive	. 297	. 176	. 125	
	Smirnov Kolmogorov Test	Negative	– . 272	– . 178	– . 076	
		Significance level corresponding (two ranges)	2 . 221	1 . 329	. 935	
			. 059	. 346		
2010	No.	mean	50	50	50	50
	a, b Normal parameters	Standard Deviation	10898 . 48	919 . 73	8 . 4678	
		The highest limit	19519 . 543	991 . 758	1 . 17124	
	Differences	Absolute value	. 324	. 177	. 112	
		Positive	. 324	. 146	. 112	
	Smirnov Kolmogorov Test	Negative	– . 297	– . 177	– . 074	
		Significance level corresponding (two ranges)	2 . 428	1 . 324	. 839	
			. 060	. 483		

Table 1. Smirnov Kolmogorov Test (Contd....)

		Year	P	DPS	Ln(P)
2011	No.	mean	50	50	50
	a, b Normal	Standard	6357 . 79	704 . 80	8 . 1080
	parameters	Deviation	10531 . 602	856 . 056	1 . 01956
	The highest limit	Absolute	. 333	. 205	. 102
		value	. 333	. 171	. 093
	Differences	Positive	– . 288	– . 205	– . 102
	Smirnov Kolmogorov	Negative	2 . 491	1 . 014	. 761
	Test			. 254	. 609
	Significance level				
	corresponding (two				
	ranges)				

a) Test distribution is normal

Calculated from the data

To determine the type of regression equation for estimating the models of relations (linear, logarithmic, inverse, 2nd grade, 3rd grade, etc.) the equations were investigated using SPSS software. Criteria such as 1) simplicity of model, 2) high level of R2 or sig.F are addressed in selecting each model. table 2 shows a summary of estimated models for the regression between variables of economic added value and company market value and DPS.

Table 2

Variable equation	Summary of model						Estimations of parameter		
	Determination coefficient	F	Freedom degree	Freedom degree	Significance level	Constant amount	B1	B2	B3
Linear model	. 031	6 . 049	1	273	. 011	8 . 425	-008E2 . 37		
Inverse	. 016	4 . 553	1	273	. 034	8 . 455	– 43 . 252		
2 nd grade	. 010	1 . 381	2	272	. 253	8 . 425	-008E2 . 36	-018E	
Compo und	. 019	1 . 717	3	271	. 164	8 . 454	-009E1 . 62	8 . 17	-022
	. 011	3 . 089	1	273	. 080	8 . 360	1 . 000	-015E	E . 51
	. 022	2 . 319	1	273	. 015	2 . 127	-5 . 805	1 . 09	5
	. 011	b.	1	273	. 080	2 . 123	-009E2 . 92		

Independent variable is the economic added value.

Considering the amounts calculated from table ln(p), it can be concluded that from among different models, this model is linear which has the minimum significance level (sig.), maximum F, and maximum determination coefficient (R.Square).

Table 3

Variable	Summary of model						Estimations of parameter		
	B1	B2	B3	B1	B2	B3	B1	B2	B3
Linear model	.020	.967	1	270	.043	966.549	-006 E-6 .25		
Inverse	.003	.687	1	270	.408	964.748	-16361.541		
2 nd grade	.006	.782	2	269	.459	987.719	-006E-9 .85	-012E-1 .54	
Compound	.011	.235	3	268	.410	977.129	-005E2 .19	-012 E-2 .92	-019 E-1 .56

Dependent factor is the economic added value.

Considering the amounts calculated in table 3 (DPS), it can be concluded that from among different models, this model is linear which has the minimum significance level (sig.), maximum F and maximum determination coefficient (R.Square).

Therefore, linear model was selected from among the presented models for price logarithm and DPS of each share.

Testing the Hypotheses

Testing the first hypothesis

After specifying type of equation and normal nature of distribution, significance test for the relation of economic added value and DPS was conducted by panel data using Eviews soft. The results obtained from data analysis are shown in table 4 in which the data for different years is combined and the coefficients of the whole period are estimated.

Table 4

Dependent variable: DPS?				
method : Pooled Least Squares				
Sample: 2007-2011				
Observations: 5				
Total panel (unbalanced) observations 272				
White Heteroskedasticity- Consistent Standard Errors & Covariance				
variable	Bet coefficient	Std. deviation	T-student	Significance level
Constant amount	966.5486	62.12284	15.55867	0.0000
Economic added value	-06E-6025	-05E1102	-0.61251	0.5407
Determination coefficient	0.000432	Mean dependent variable		961.7353
Adjusted determination coefficient	0.00327	Standard deviation of dependent variable		1016.7070
S.E. of regression	1018.368	Total remaining squares		280000000
Prepared F	0.11665	Watson camera		0.4757
Statistical F	0.732963			

Since considering the aforesaid table, the meaningful level is >05% (0.5407) (it means there is no meaningful relationship between DPS and economic value added) and concerning the fact that its Beta coefficient is negative (-6.25×10^{-6}), it indicates that there is a negative relationship between economic value added and DPS. Thus, according to the results obtained, there is no meaningful relationship between DPS and economic value added of the companies, accepted by securities and exchange organization. Since Watson camera in this table equals to 0.4757, far from its desirable level (1.5-2.5), in order to remove such self-correlation, Auto Regression Model is used in this test. Considering Table 5 and using AR Model, it is found that Watson Camera becomes closer to its desirable level. However, considering the meaningful level (0.5932) and Beta coefficient (-4.96×10^{-6}), obtained from this table, presents no relationship between economic value added and dividend of each stock.

Table 5

Dependent variable: DPS?				
Method: Pooled Least Squares				
Sample: 1386-1390				
observations : 5				
Total panel (unbalanced) observations 213				
Convergence achieved after 3 iteration (s)				
White Heteroskedasticity- Consistent Standard Errors & Covariance				
Cross sections without valid observations dropped				
Variable	Bet coefficient	Std. deviation	T-Student	Significance level
Constant amount	736 . 0126	158 . 3712	4 . 647388	0 . 0000
Economic added value	-06E-4 . 96	-06E9 . 28	-0 . 53503	0 . 5932
Auto-regression	0 . 775191	0 . 073405	10 . 56053	0 . 0000
Determination coefficient	0 . 575564	Mean dependent variable		937 . 1174
Adjusted determination coefficient	0 . 571522	Standard deviation of dependent variable		1018 . 9460
S.E. of regression	666 . 984	Total remaining squares		93422212
Prepared F	142 . 3872	Watson camera		1 . 9751
Statistical F	0 . 0000			

Testing the second hypothesis

Using Panel Data method by the help of Exviews software, the relationship between economic value added and market value of a company, of which data have been combined in different years and then, estimation of coefficients has been done for the whole period, respective results, obtained from data analysis, has been given in Table 6.

Table 6

Dependent variable : LNP				
method : Pooled Least Squares				
Sample : 1390-1386				
No. of observations : 5				
Total panel (unbalanced) observations 275				
White Heteroskedasticity- Consistent Standard Errors & Covariance				
Variable	Bet coefficient	Std. deviation	T-Student	Significance level
Constant amount	8 . 424939	0 . 06481	129 . 9942	0 . 0000
Economic added value	-06E2 . 37	-09E8 . 93	2 . 653749	0 . 0084
Determination coefficient	0 . 100019	Mean dependent variable		8 . 4475
Adjusted determination coefficient	0 . 093930	Standard deviation of dependent variable		1 . 0517
S.E. of regression	1 . 048331	Total remaining squares		300 . 0265
Prepared F	2 . 762985	Watson camera		0 . 3565
Statistical F	0 . 097616			

The aforesaid table indicates the test for relationship between market value of a company and economic value added of the companies, accepted by securities and exchange organization. Since its meaningful level is 0.0084 in this test, which is <5%, it shows a meaningful level. Since its Beta Coefficient equals to 2.37×10^{-6} and it is positive, it indicates that there is a positive relationship between economic value added and company market value. Concerning the fact that Watson camera in this table equals to 0.3565, far from its desirable level (1.5-2), in order to remove such self-correlation in this test, we use Auto Regression Model in this test. In the following table, using AR Model, we can find that Watson Camera becomes closer to its desirable level. While, it is found that there is a meaningful relationship between price and economic value added in such a way as its meaningful level is <5% (i.e. 0.006) and Beta coefficient equals to 3.96×10^{-6} .

Table 7

Dependent variable : LNP				
method : Pooled Least Squares				
sample : 1386-1390				
No. of observations : 5				
Total panel (unbalanced) observations 217				
Convergence achieved after 4 iteration(s)				
White Heteroskedasticity- Consistent Standard Errors & Covariance				
Cross sections without valid observations dropped				
Variable	Bet coefficient	Std. deviation	T-Student	Significance level
Constant amount	7 . 439575	0 . 400958	18 . 55452	0 . 0000
Economic added value	-06E3 . 96	-08E1 . 44	2 . 745714	0 . 0066

Auto-regression	0 . 876014	0 . 050248	17 . 43368	0 . 0000
Determination coefficient	0 . 700527	Mean dependent variable		8 . 3876
Adjusted determination coefficient	0 . 697728	Standard deviation of dependent variable		1 . 0887
S.E. of regression	0 . 598573	Total remaining squares		76 . 6739
Prepared F	250 . 294	Watson camera		2 . 1743
Statistical F	0 . 0000			

Therefore, single-variable linear regression model $Y_{1it} = \alpha_1 + \beta_1 \cdot X_{it} + \epsilon_{it}$ is determined as follows:

$$(\text{Economic added value}) = 8.421 + 0.00000237(\text{company market value})Lnp$$

The above model indicates that for in return for change in economic value added per one unit, company value added will change by $2.37 \cdot 10^{-8}$ accordingly.

Testing the third hypothesis

The third hypothesis test is as follows:

$$\begin{cases} H_0: r_2 \leq r_1 \\ H_1: r_2 > r_1 \end{cases}$$

Where, R1 is the correlation coefficient of first model) R2 is correlation coefficient of second model.

$$Z_1 = \frac{1}{2} \log \left(\frac{1+r_1}{1-r_1} \right) \qquad \text{Var}(Z_1) = \frac{1}{n_1-3}$$

$$Z_2 = \frac{1}{2} \log \left(\frac{1+r_2}{1-r_2} \right) \qquad \text{Var}(Z_2) = \frac{1}{n_2-3}$$

$$Z^* = \frac{Z_2 - Z_1}{\sqrt{\frac{1}{n_1-3} + \frac{1}{n_2-3}}}$$

Considering the two models obtained from the testing of first and second hypotheses, their determination coefficients are as follows:

$$r_1^2 = 0/000432 \quad n_1 = 273$$

$$n_2 = 276 \qquad r_2^2 = 0/10019$$

$$Z_1 = -0/0207 \quad Z_2 = +0/3165$$

$$Z^* = \frac{0/31 - (-0/0207)}{\sqrt{\frac{1}{273} + \frac{1}{276}}} = 3/44$$

Since Testing H_3 indicates the figure 3.44 i.e. it is in rejection area of H_0 . Thus, H_0 is rejected and H_1 is accepted. Thus, the correlation in the second model is meaningfully $>$ that of the first model meaningfully. Thus, Testing H_3 in “Study of the effect of economic value added on stock return elements, accepted by Securities and Exchange Organization and the effect of economic value added on market value of a company is more compared to DPS”, is confirmed.

DISCUSSION AND CONCLUSION

The effect of securities and exchange on economic development of countries is inevitable. The main duty of this capital market is to effectively get capitals be hired and to allot the said resources to the best interest. Thus, an efficient market is necessary. From among the required conditions for establishment of such market, one can point out all existing information including accounting information, which enjoy the two characteristics of existing and reliability, are accessed by all investors and creditors equally and with spending no money. Considering the countries with efficient securities and exchange, all existing information including accounting information, which enjoy the aforesaid two characteristics, are accessed by all investors and creditors equally and with spending no money in this regard. Regarding the countries, with efficient securities and exchange, all information, associated with securities are indicated in market price of the same accordingly.

In this market, there is no possibility for access of unusual return and investment return is proportionate to respective risk. However, with respect to the countries where there is no efficient capital market, there is a noticeable difference between market price of securities and their real price. Therefore, an investor must conduct an extensive analysis for purchase of respective stocks. A major part of such analyses is concerned about study of the operation of a trading unit. In this research, a criterion under the name of “value added”, as one of helpful information in evaluation of companies, was studied accordingly. The said criterion, which is concerned about creating value, can measure three methods by the help of which a company may create value when it is accompanied by cash profit (Stewart and Bennett-1999-177-178).

1. Raise of efficiency of current operations
2. Achievement of profiting growth
3. Abandonment of uneconomic activities

There is another importance, which is attached to economic value: when it is declined to current value, it represents net current value of all capital plans of the company. Thus, establishment of internal goal is to maximize economic value added and its growth shall bring about an expenditure external result in value of the company. Thanks to usefulness of economic value, the correlation between economic value added and DPS and market value of the company has been studied herein this research. As far as this research proves inefficiency of economic value added at Tehran Securities and Exchange Organization, one of the most important reasons, which can be pointed out with respect to inefficiency of economic value

added at Tehran Securities and Exchange Organization, is inefficiency of market. Inefficiency of securities and exchange means that capital is not an effective element in decisions on investment. In other words, the body of market is not able to precisely and to correctly measure stocks market portfolio risk and eventually, it can't determine its expected return only by relying on the said measurement. Consequently, real price of stocks is not tangible.

Lack of efficient market conditions is one of other important elements in absence of a strong relationship between economic value added and stocks return. Due to lack of specialized investment institutions in Iran, Tehran Securities and Exchange Organization determines basic price of stocks based on pricing accounting models. Although it is possible to use accounting figures for valuing goals on stocks, accounting measurements have not essentially been design for the said goals. One can rely on accounting information, which may be manipulated and distorted only due to lack of clear information, which are required by an efficient market. Further to the aforesaid items, considering inflation conditions is of great importance. Growth in inflation and liquidity, which shall lead to growth of exchange indices and market value of a company, and, parts of increase in stocks return is originated from increase of inflation in a society.

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