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The Study and Evaluation of Stocks' Valuation Models in Tehran Stock Exchange

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Abstract

In today's world, with the expansion of privatization and turning toward the purchase and sale of shares, the need to extensive research is felt in the field of accounting and finance. One of these important areas refers to the studies relevant to stocks valuation and specifying effective variables in determining the price of shares. This study is done with the aim of testing different valuation models of stocks based on basic variables in the economic environment of Iran and tries to identify basic variables as well as introducing a model for pricing stock through testing several stocks valuation models which has the most important role in explaining the stock prices of Iranian companies. The regression was used to test the stocks valuation models. The results obtained from this study indicated that the model of price to book value ratio (P/B) has the highest adjusted coefficient of determination and is determined as the best stocks' valuation model among the models tested.

Keywords: fundamental variables, stock price, stocks valuation models, Tehran Stock Exchange

Introduction

In the economical markets, the tradable assets pricing play a fundamental role in resource allocation. Therefore, there is the essential need to understand important factors describing the price of these assets. Financial theories suggest that the value of a share is equal to its present value of expected earnings. The desire to understand the stock pricing in the absence of the uniform and same set of variables that is a representative for expected future results lead to the rapid emergence of the stocks' valuation models, while almost all stocks pricing models and frameworks have a theoretical basis.

Some of conducted researches such the research of Bernard (1995), Collins (1997) and Rees (1997) argue that the fundamental variables are the most important variables in the stocks pricing. The convincing evidence presented in these studies show that the fluctuation and instability in the stock price can be described by fluctuations in dividends, cash flow and the fundamental variables. But other researches, such as the research of Amir and Lev (1996) argue that the fundamental variables can not calculate the fluctuations in the stock price in any position. Greater need for understanding stock price on the one hand and the lack of the uniform and same set of variables to explain the stock price on the other hand causes the stock price becomes one of the important issues for the research. It seems that there is a general consensus on incompletion of financial assets pricing theory. The evolution of financial asset pricing theory requires that the intrinsic prices and value of an asset to be obtained by an acceptable valuation model. Therefore, this study tried to test and develop a number of stocks valuation models.

Stock market in Iran is growing increasingly and is regarded as one of the most important mechanisms in the development of the economic structure and its importance is increasing every day. One reason for the continuous increase of companies accepted in the exchange refers to the policy of government namely the privatization policy that aims to reduce the management of government and transfer the governmental companies to private sector. The main factor in the transfer of capital refers to the price of supplied Stock Exchange that is initially determined in the Bourse. The main purpose of this study was to investigate the explanatory power of fundamental variables such as earnings per share, dividend per share, book value per share, beta, net profit margin, growth rate of dividend, etc.

There are many stock valuation models that have been tested in different studies. Several stock valuation

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models with theoretical support are tested in this study including Edwards-Bell-Ohlson Model (EBO), models based on EVA (Economic Value Added), model P/E (price to earnings per share ratio), model P/B (price to book value ratio) and model P/S (price to sales ratio). This study tries to examine different stocks valuation models based on the fundamental variables and provide the most appropriate model based on the fundamental variables to describe the stock price. In this study, variables such as earnings per share, net profit margin, the percentage of dividend, beta, and growth rate of dividend, etc are examined in the economic environment of Iran. This study can be used by various individuals, institutions, organizations. The most important organizations which use the result of this study are Stock Exchange Organization, investment companies, financing companies, brokerage institutions, creditors, banks and shareholders. Also, government is one of the most important users that for privatization and governmental share assignment need a model to determine the price of assigned shares in a way that follows the benefit of both parties (government and buyer).

Background of the Study

During the recent years, numerous articles on pricing and stock price forecasting have been done that aimed to provide models for predicting the stock price by using regression methods, neural networks and other methods. One of these studies refers to the research of Stewart (1990). He has investigated the relationship between economic profits and market value of the company. He placed a sample of 613 companies in 25 portfolios and ranked them in terms of economic benefit and changes in their economic benefit. He found a strong correlation between economic profit and market value added (MVA) as well as a stronger correlation between the changes in economic benefit and changes in MVA. This strong correlation led the author to conclude that MVA is largely compatible with the economic benefit.

Damvdaran (1996), in line with providing a model for stock pricing, suggested stock price to sales (P/S) model that linearly depends on four main variables. These variables include the percentage of dividend, dividend growth rate, beta, and profit margins. Damvdaran's Model explained 77.26 % of the price changes for 1995. He also found that the coefficients of all variables are consistent with their expectations.

Dastgiri and Hosseini Afshari (2004) in a study entitled "The evaluation of stock pricing methods in Tehran Stock Exchange" examined some stock pricing models. They selected three pricing models proposed in financial management theories and compared the prices obtained from the mentioned models with the stock prices in the Tehran Stock Exchange market. The statistical population of their study consisted of all accepted companies in the Tehran Stock Exchange in 1997. The results of their study showed Walter's model provides values closer to market prices compared to the Gordon's model and the present value of future cash flows model. Also, according to the results of study, if the fixed expected rate of return (40%) to be used, the Gordon model show a closer value to the market price than the other two models.

Vaez, Abzary and Jamali (2009) in their study entitled "Predictability of stock price in Tehran Stock Exchange by using the capital asset pricing model" have investigated the predictability of stock price, the efficiency rate and how expectations are formed in stock Exchange. They conducted their own investigations by selecting companies that have been active in the non-metallic mineral, financial intermediaries and car industries during 2000 to 2004 in the Stock Exchange market. First, the intrinsic value of the company's shares in the above mentioned industries were examined by using CAPM model, then the relationship between the stock price and intrinsic value of stock were considered for companies that their systematic risk was significant. In this study, the relationship between current returns of stock and the past returns of stock has been tested in order to evaluate the performance of the stock market. Finally, how expectations are formed by using ECM model is investigated.

Methodology

The methodology for conducting this study is quasi-experimental method and the ordinary least squares regression was used to test the stock valuation models. Research data were generally collected through the information website of the Tehran Stock Exchange and tact processor software. Also, EVIEWS software was used to analyze the data. EVIEWS software was used because of having facilities to ensure of the lack of autocorrelation and heteroskedasticity of variance. The value of the Durbin - Watson (DW) was used to test the existence of autocorrelation and Arch test was used to evaluate the lack of a problem called variance anisotropy in the regression. The adjusted coefficient of determination was used to determine the most appropriate model as well as the ranking.

Population and statistical sample

The statistical population of this study refers to the accepted companies in Tehran Stock Exchange which have been active in stock from 2003 until 2008. The exclusion sampling method is used to select the sample. The following criteria are considered for sample selection:

1. The Company Financial Year leading to the end of March,

2. The company does not have a trading halt more than 6 months,

3. The company does not associate with financial intermediation, and 4. The company's information to be available for all years studied. After considering all the above issues, the number of companies decreased to 49 companies. These companies were selected as sample.

Research Models

Models are tested in this study, are as follows: 1) Stock Valuation Models based on the framework of Edward Bell and Olson (EBO) In this section, two models will be tested as follows:

EBO base model

$P_{it} = \alpha_0 + \alpha_1\ EPS_{it} + \alpha_2\ BV_{it} + \varepsilon_T$

In this model, Pit, the price per share for common stock of company i in year t; EPS_{it}, earnings per share for company i in year t; BV_{it}, book value per share of common stock of company i in year t and ε_T is disturbing component with zero mean.

1. Developed model of EBO

$P_{it} = \alpha_0 + \alpha_1\ DPS_{it} + \alpha_2\ RE_{it} + \alpha_3(BV_{it}+TD_{it}) - \alpha_4 TD_{it} + \alpha_5 CE_{it} + \varepsilon_T$

In this model, Pit, the price per share for common stock of firm i in year t; DPS_{it}, dividends per share for common stock of company i in year t; RE_{it}, retained earnings per share for company i in year t; BV_{it}, book value per share for common stock of company i in the year t; TD_{it}, total liabilities per share; CE_{it}, capital expenditure per share and ε_T is disturbing component with zero mean.

2.Stock valuation models based on Economic Value Added (EVA)

Stock valuation models based on Economic Value Added (EVA) is comprised of two models which are as follows:

$MV/Cap = \alpha_0 + \alpha_1((EVA_{it}/c_{it})/Cap) + \varepsilon_T$

The first model:

In this model, MV, the market value of equity; Cap, capital employed; EVA_{it}, net operating profit after-tax minus capital changes (i.e., (C * × Cap) and C_{it} is the average weight of capital cost.

The second model: $MV/Cap = \alpha_0+\alpha_1 \text{Ln Cap} + \alpha_2((EVA^{+}_{it}/c_{it})/Cap)+\alpha_3((EVA^{-}_{it}/c_{it})/Cap)+\varepsilon_T$

In this model, MV, the market value of equity; Cap, capital employed; EVAit, net operating profit after-tax minus capital changes (i.e., (C * × Cap) and C_{it}; the average weight of capital cost; EVA^{+}_{it}, if EVA is positive (otherwise is zero), and EVA^{-}_{it}, if EVA is negative (otherwise is zero).

3. Price to Earning Model (P / E)

$P/E = \alpha_0 + \alpha_1\ Beta_{it} + \alpha_2\ Growth_{it} + \alpha_3\ Payout_{it} + \varepsilon_T$

In this model, Betait, systematic risk; $Growth_{it}$, dividend growth rate, and $Payout_{it}$ is the dividend percentage.

4. Price to book value Model (P / B):

$P/B = \alpha_0 + \alpha_1\ Beta_{it} + \alpha_2\ Growth_{it} + \alpha_3\ ROE_{it} + \alpha_4\ Payout_{it} + \varepsilon_T$

In this model, P/B, the ratio of price to book value per share; Betait, systematic risk; $Growth_{it}$, the growth rate of dividend; $Payout_{it}$, the percentage of dividend and ROE_{it} is the return on equity.

5. Price to Sales Model (P / S)

$P/S = \alpha_0 + \alpha_1\ Beta_{it} + \alpha_2\ Growth_{it} + \alpha_3\ Margin_{it} + \alpha_4\ Payout_{it} + \varepsilon_T$

In this model, Betait, systematic risk; $Growth_{it}$, the growth rate of dividend; $Payout_{it}$, the percentage of dividend and $Margin_{it}$ is net profit margin.

Research variables

Dependent variables: The dependent variables and the how to measure them is as follows:

Price per share (P_{it}): Price per share for common stock of company i at the end of year t.

The ratio of Market value of equity to capital employed (*Mv/Cap*): This ratio is calculated through division of market value of equity to capital employed namely, the sum of debts and equity.

The ratio of price to earnings per share (P/E): This ratio is calculated through division of price per share to earnings per share.

The ratio of price to book value per share (P/B): This ratio is calculated through division of price per share on book value per share.

The ratio of price to the sale price per share (P/S): This ratio is calculated through division of price per share to the amount of net sales for per share.

Independent variables: Independent variable and the method of their calculation are as follows:

Market value of equity (MV) is obtained by multiplying the exchange price per share at year-end in the number of shares of each of the years studied.

Capital Employed: (Cap) is equal to the sum of debt and equity.

Economic Value Added (EVA): Economic Value Added is obtained from the following equation: $EVA=(r-C^*)\times Cap$

In which R, the return rate of capital and C * is the average weight of capital cost. B (β): is the representative of systemic risk. This number is calculated for each company by using the market model. The returns of the past 36 months of company and total market index are used to estimate the beta.

Dividend Growth Rate (Growth): it is calculated by assuming relative constant of the ratio of profit accumulation and return of particular value.

Percentage of dividend (Payout): is equal to the ratio of cash benefit per share to the earnings per share.

Return on equity (ROE): is equal to the ratio of net profit to equity.

Net profit margin (Margin): is equal to the ratio of net profit to net sales. Book value per share (BV): is equal to the value per share according to the company's offices.

Dividend per share (DPS): the amount that is awarded to per ordinary share in the cash benefit paying time.

Capital expenditure (CE): is equal to the amount of the increase in the fixed assets and long term investments for per share.

Total debt for per share (TD): it is obtained from the division of total debts on the number of shares.

The average weight of capital cost rate (C*): The Bacidor model (1997) is used for its calculation which is as follows:

$$WACC = \frac{D_m}{D_m + E_m} Kd + \frac{E_m}{D_m + E_m} K_s$$

In which, D_m, book value of total debts; E_m, market value of equity; K_d, the cost of debt (tax rate -1) × interest rate of debt = cost of debt) and K_s is the rates of common stock cost, retained earnings, and deposits.

Findings of the study

Descriptive Statistics

Descriptive statistics of research variables are given in table 1. The descriptive statistics of variables includes mean, median, maximum, minimum, standard deviation and number of observations. For example, the mean of stock price of sample companies is 8313 Rials, the median of sample companies' stock price 4076 Rials, the maximum price 88,100 Rials, the minimum price of sample companies 761 Rials and the standard deviation of the sample companies' price is 13,000 Rials. The results of the descriptive statistics indicate that the variables have sufficient dispersion and observations have required diversity to test models. In other words, the selected sample has required variation to generalize to the population.

Table 1. Descriptive statistics of research variables

NO	SD	Min	Max	Median	Mean	Variable
294	6/12299	671	88100	5/4076	8313	P
294	4/5	39/0-	3/41	2	8/3	P/B
294	9/2	07/0	8/26	9/0	9/1	P/S
294	5/1	05/0	10	7/0	2/1	MV/CAP
294	3/929	0	2/6040	5/522	6/830	DPS
294	4/982	4/3657-	3/7094	9/401	686	RE
294	4188	1/2166	8/24728	8/5852	7/7226	(BV+TD)
294	3/3802	7/885	5/22903	4/3816	7/5175	TD
294	8/1421	0	3/9011	4/298	8/618	CE
294	7/818	4/2	9/7867	2/263	1/536	EPS
294	8/1340	7/2526-	4/14617	9/1776	9/2050	BV
294	6/0	5/1-	4/3	24/0	29/0	Beta
294	23/0	82/0-	5/1	09/0	14/0	Growth
294	34/0	38/0-	52/3	16/0	23/0	Margin
294	3/24	0	9/286	5/1	4/6	Payout
294	63/0	49/4	85/7	56/5	67/5	Ln Cap
294	94/0	0	66/8	0	29/0	$((EVA^{+}/c)/Cap)$
294	22/3	07/51-	0	32/0-	61/0-	$((EVA^{-}/c)/Cap)$
294	4/3	08/51-	7/8	33/0-	33/0-	((EVA/c)/Cap)

The model test results and data analysis

Model test results of Edward Bell and Ohlson (EBO) is presented in table 2. As can be seen in in this table, the coefficient of earnings per share is positive in regression analysis of combined data which indicates a positive relationship between earnings per share and stock price and this is due to the effect that earnings per share has in determining the stock price in the market of Iran. Model test results show that in Tehran Stock Exchange market, the book value per share is not a determinant factor in specifying the stock price and this finding is not compatible with western studies. Collins (1997) by using data from American companies concluded that the American investors in addition to earnings per share pay attention to the book value.

Table 2. EBO model test results

	$P_{it} = \alpha_0 + \alpha_1 EPS_{it} + \alpha_2 BV_{it} + \varepsilon_T$				
Year	α_0	EPS_{it}	BV_{it}	Adjusted R^2	Durbin-Watson test
Pool	99/2170 (15/6) *	36/2 (73/2)*	11/0- (91/0-)	61/0	02/2
81	22/89- (04/0-)	58/10 *(35/12)	05/1 (13/2)**	76/0	74/1
82	73/7462 (5/1)	79/12 (3/5) *	64/1- (77/0-)	52/0	06/2
83	75/1637 (59/0)	21/6 (61/5)*	18/2 (47/2) *	58/0	03/2
84	08/3288 (37/1)	6/9 (1/10)*	74/0- (72/0-)	66/0	99/1
85	78/398- (38/0-)	61/1 (05/1)	1/2 (71/4) *	36/0	51/1
86	17/201- (2/0-)	04/0 (02/0)	09/2 (91/4) *	32/0	06/2

*, ** shows the significance level of .001 and .05; Numbers in parentheses are t-statistic values.

Table 3. Test results of developed EBO model

	$P_{it} = \alpha_0 + \alpha_1 DPS_{it} + \alpha_2 RE_{it} + \alpha_3 (BV_{it}+TD_{it}) - \alpha_4 TD_{it} + \alpha_5 CE_{it} + \varepsilon_T$							
Year	α_0	DPS_{it}	RE_{it}	$(BV_{it}+TD_{it})$	TD_{it}	CE_{it}	Adjusted R^2	Durbin-Watson
Pool	83/626 (77/1)*	64/2 (13/8)**	74/0 (84/2) **	09/0- (47/0-)	34/0 (56/1)	24/0- (89/1-)*	75/0	23/2
81	47/5664- (91/1-)	92/8 (79/6)**	63/0- (32/0-)	7/1 (79/1)	65/1- (74/1-)*	02/6 (68/2)**	61/0	61/1
82	97/4233 (84/0)	97/9 (96/4)**	16/0 (07/0)	78/0- (38/0-)	76/0 (37/0)	55/0 (39/0)	55/0	82/1
83	59/1535 (42/0)	1/5 (24/4)**	89/2- (98/0-)	03/2 (88/0)	04/2- (89/0-)	01/1 (49/1)	51/0	89/1
84	24/282 (08/0)	13/6 (57/5)**	02/0 (0)	34/0 (13/0)	35/0- (13/0-)	31/0 (46/0)	43/0	65/1
85	85/279- (25/0-)	67/1 (61/3)**	12/1- (95/1-)*	18/2 (64/3)**	19/2- (65/3-)	37/0- (03/1-)	59/0	2
86	7/716- (37/0-)	59/1 (83/2)**	26/0- (16/0-)	12/2 (37/1)	12/2- (37/1-)	4/0- (58/1-)	41/0	15/2

*, ** shows the significance level of .001 and .05; Numbers in parentheses are t-statistic values.

The adjusted regression coefficient indicates that the research variables during 2003 to 2008 respectively explain 77%, 55%, 60%, 68%, 38%, and 35% of the stock price changes. These results indicate that the base EBO model has satisfactory explanatory power. The adjusted coefficient of determination for combined sample is equal to 61% which is used to determine the best model.

The test results of developed EBO model are given in table 3. The test results of developed EBO model show that variables determining the cash profit value of stock are retained earnings and capital expenditures of the company. However, the effect of these variables was different in the different years. The results of this model indicated that the book value has no role in determining the value of company. The results of this study in relation to the book value variable are in contrast with the findings of Rees (1997). Rees (1997) by using data from British companies showed that British investors in addition to retained earnings and dividend per share pay attention to the capital expenditure and book value per share too, but like the results of this study dividend is more important among British investors.

The adjusted determination coefficient of model for different years respectively is 65%, 61%, 57%, 49%, 64% and 47%. The adjusted determination coefficient is equal to 75% for combined data. According to the model variables and the adjusted coefficient of determination it can be concluded that the future price of the stock has strong relation with past performance.

The test results of the first model of added value are given in the table 4. The results of added value model show that the added value of variable determines the value of the company. However, the effect of these variables has been various in the different years. The determination coefficients obtained for the first model of added value for the years 2003 to 2008 respectively are: 0.03, 0.01, 0.08, 0, 0.01 and 0 which is very low.

The test results of developed value-added model of O'Byrne are presented in table 5 which showed that this model has higher ability in determining the value of company in comparison with the first model of added value. In developed value-added model of O'Byrne, the determinant variables of the company value include employed capital and the positive Economic Value Added and the negative Economic Value Added has no role in determining company value. O'Byrne (1996) by using data from American companies for the period of 1985-1993 reported negative the coefficient of Ln (Cap) and positive for the coefficients (EVA +/ c) / Cap and (EVA-/ c) / Cap that are consistent with the values reported in this study. The determination coefficients obtained for developed value-added model of O'Byrne for the years 2003 to 2008 respectively are: 63%, 38%, 31%, 24%, 35%, and 33%, which indicates has more explanatory power than the first model.

Table 4. Test results of EVA model

$MV/Cap = \alpha_0 + \alpha_1\,((EVA_{it}/c_{it})/Cap) + \varepsilon_T$				
Year	α_0	**$((EVA_{it}/c_{it})/$ Cap)**	**Adjusted R^2**	**Durbin-Watson**
Pool	35/0 (04/7) **	02/0 (3/2) **	61/0	03/2
81	07/0 (96/4) **	0 (29/1)	01/0	09/2
82	05/0 (88/4) **	0 (31/2) **	08/0	79/1
83	03/0 (62/6) **	01/0 (12/2) **	06/0	75/1
84	01/0 (95/4) **	0 (12/0)	02/0-	18/2
85	01/0 *(52/5)	0 (71/0)	01/0-	93/1
86	0 (98/4) **	0 (18/0-)	02/0-	86/1

*, ** shows the significance level of .001 and .05; Numbers in parentheses are t-statistic values.

The test results of P/E model are given in table 6. The test results show that the dividend policy (profit distribution percentage) for all years is one of the most important factors in determining the ratio of price to earnings. Cumulative regression results indicate the importance of all three variables of growth, risk and percentage of profit distribution in determining the mentioned ratio, and consequently determining the value of company. The adjusted determination coefficients indicate that the research variables from 2003 to 2008 explain respectively 92%, 87%, 98%, 97%, 96% and 16% variation of ratio of price to earnings per share. The adjusted determination coefficient is equal to 72% due to the combined data.

The test results of P/B model are shown in table 7. The results of P/B model indicate that the company's growth and return on equity have a significant role in determining the ratio of P/B. The determination coefficient for different years is respectively 80%, 51%, 81%, 76%, 45% and 29%, which is relatively high. The adjusted determination coefficient for compound data is equal to 80%. The results of this model are consistent with the study results of Damodaran (1994).

Table 5. Test results of developed EVA model of O'Byrne

	$Mv/Cap=\alpha_0 + \alpha_1 \text{ Ln Cap} + \alpha_2 ((EVA^+_{it}/c_{it})/Cap) + \alpha_3 ((EVA^-_{it}/c_{it})/Cap) + \varepsilon_T$					
Year	α_0	Ln Cap	$((EVA^+_{it}/c_{it})/Cap)$	$((EVA^-_{it}/c_{it})/Cap)$	Adjusted R^2	Durbin-Watson
Pool	66/1 (35/4) **	21/0 (4/3) **	19/0 (71/5) **	01/0 (35/1)	70/0	96/1
81	2/0 (3/2) **	03/0- (91/1-)	09/0 (06/8) **	0 (09/0)	60/0	88/1
82	19/0 (24/2) **	02/0- (9/1-)	02/0 (79/4) **	0 (1/1-)	34/0	1/2
83	16/0 (4) **	02/0- (5/3-)**	02/0 (29/2) **	01/0- (12/1-)	27/0	51/1
84	1/0 (5/3) **	01/0- (02/3-)**	01/0 (79/1) *	0 (25/0-)	19/0	68/1
85	1/0 (54/5) **	01/0- (63/4-)**	0 (77/0-)	0 (18/1)	31/0	85/1
86	07/0 (26/5) **	01/0- (72/4-)**	0 (16/0)	0 (46/0-)	29/0	86/1

*, ** shows the significance level of .001 and .05; Numbers in parentheses are t-statistic values.

Table 6. Test results of P/E model

	$P/E = \alpha_0 + \alpha_1 \text{ Beta}_{it} + \alpha_2 \text{ Growth}_{it} + \alpha_3 \text{ Payout}_{it} + \varepsilon_T$					
Year	α_0	$Beta_{it}$	$Growth_{it}$	$Payout_{it}$	Adjusted R	Durbin-Watson
Pool	19/15 (94/5) **	65/1 (54/2) **	81/2- (53/2-)**	12/1 (57/5) **	72/0	92/1
81	59/12 (95/1) **	85/11- (79/1-)*	53/16 (81/0)	49/7 (79/23) **	92/0	2
82	91/16 (88/1) *	62/17- (11/1-)	42/12- (55/0-)	26/7 (51/17) **	86/0	2
83	17/6 (79/1) *	45/0 (08/0)	33/32 (74/2) **	23/5 (14/59) **	98/0	05/2
84	98/5 (4/1)	22/9 (31/1)	4/25 (64/1)	8/2 (5/38) **	96/0	35/2
85	54/9 (1/3) **	35/1 (5/0)	59/13 (35/1)	29/3 (72/36) **	96/0	68/1
86	64/16 (52/1)	49/0- (03/0-)	34/20 (58/0)	56/4 (01/3) **	11/0	05/2

*, ** shows the significance level of .001 and .05; Numbers in parentheses are t-statistic values.

The P/S model test results are presented in table 8. The results of P/S model show that the percentage of net profit margin has a significant role in determining the ratio of P/S. The determination coefficient of regression indicates that the research variables during 2003 to 2008 respectively explain 61%, 55%, 80%, 69%, 39% and 49% of variation of the price to sales ratio. The adjusted determination coefficient for combined data is equal to 62%. According to the adjusted determination coefficient in various models the effect of the company's historical financial information and past performance can be realized in determining future stock prices.

Table 7. Test results of P/B model

		$P/B = \alpha_0 + \alpha_1 Beta_{it} + \alpha_2 Growth_{it} + \alpha_3 ROE_{it} + \alpha_4 Payout_{it} + \varepsilon_T$					
Year	α_0	$Beta_{it}$	$Growth_{it}$	ROE_{it}	$Payout_{it}$	Adjusted R	Durbin-Watson
Pool	63/0 (4/6) **	02/0 (3/0)	78/0- (22/3-)**	72/3 (24/11) **	0 (02/0)	80/0	12/2
81	65/1- (98/0-)	15/0- (2/0-)	19/3- (47/1-)	16/14 (22/12) **	01/0 (4/0)	78/0	78/1
82	75/1 (35/1)	7/3- (9/1-)*	59/2 (94/0)	03/8 (74/6) **	01/0- (31/0-)	46/0	97/1
83	97/0- (8/1-)	85/0- (19/1-)	2/0 (14/0)	39/10 (99/13) **	01/0- (74/1-)	80/0	39/2
84	34/0- (69/0-)	36/0- (51/0-)	42/2- (56/1-)	27/8 (06/12) **	0 (73/0-)	74/0	37/2
85	5/0 (71/1) *	03/0 (22/0)	15/0- (18/0-)	5/4 (81/4**	0 (72/0)	40/0	19/2
86	89/0 (82/2) **	69/0 (62/2) **	56/2- (61/2-)**	1/3 (73/2) **	0 (27/0-)	22/0	09/2

*, ** shows the significance level of .001 and .05; Numbers in parentheses are t-statistic values.

Table 8. Test results of P/S model

		$P/S = \alpha_0 + \alpha_1 Beta_{it} + \alpha_2 Growth_{it} + \alpha_3 Margin_{it} + \alpha_4 Payout_{it} + \varepsilon_T$					
Year	α_0	$Beta_{it}$	$Growth_{it}$	$Margin_{it}$	$Payout_{it}$	Adjusted R	Durbin-Watson
Pool	37/0 (74/4) **	16/0 (18/3) **	37/0- (71/2-)**	2/3 (91/7) **	0 (92/0-)	62/0	08/2
81	19/0 (45/0)	34/0- (01/1-)	44/0 (43/0)	72/8 (16/8) **	0 (46/0-)	58/0	73/1
82	43/2 ** (39/2)	25/2- (9/1-)	51/2- (33/1-)	25/6 (57/6) **	01/0- (4/0-)	50/0	99/1
83	77/0 (35/1)	44/0- (02/1-)	15/1- (27/1-)	85/7 (84/11) **	0 (39/0-)	78/0	62/1
84	16/0- (55/0-)	09/0- (21/0-)	12/1- (23/1-)	87/8 (84/9) **	0 (21/0-)	66/0	69/1
85	65/0 (34/2) **	14/0 (6/0)	33/1 (29/1)	89/1 (89/3) **	0 (05/0)	34/0	56/2
86	26/0 (71/0)	18/0 (60/0)	96/0 (29/1)	8/6 *(38/5)	05/0- (64/1-)	43/0	92/1

*, ** shows the significance level of .001 and .05; Numbers in parentheses are t-statistic values.

Conclusions

This study examined some stock valuation models for a period of 6 years in the Tehran Stock Exchange. The results of this study showed that:

1. In Iran variables of earnings per share, dividend per share, systematic risk, the net profit margin and return on equity are the major factors in explaining the stock price of companies accepted in Tehran Stock Exchange.

2. The results of this study showed that the developed EBO model has high explanatory power to determine the stock value.

3. With the exception of 2008, the explanatory power of the ratio of price to earnings per share has

increased in recent years and this indicates the shareholders' attention to this ratio in recent years. But about the ratio of price to book value per share and price to sale, the explanatory power of these models are decreasing every year which indicating the less attention of shareholders to this ratio in recent years.

4. The poor results of the first model of stock pricing based on EVA can be attributed to the shareholders' inattention to variables of this model and inefficiency of capital market of Iran in terms of accessing to information about this model.

Limitations of the study

In the course of conducting this study, there were limitations that may affect the results: these limitations are:

1. Lack of regular and organized database in order to access to the companies' information which makes questionable the data used in the study.

2. The limited number of community members and research sample that may affect the research results.

3. The lack of calculation of beta and returns and capital cost rates of companies by the stock exchange can also be regarded as one of the limitations of the study because the calculation of these two factors requires too much data about the company's capital structure, dividend, capital changes, etc that a normal person could hardly have access to them, so the validity of these variables in this study is questionable.

4. Due to the predictive nature of most research variables and high calculation in order to achieve the final figure of a variable like EVA, the existed error in calculation can be also considered as one of the limitations of the study.

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