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Studying the effect of assets return rate on stock price of the companies accepted in Tehran stock exchange

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One of the criteria to evaluate management ability of a company to gain return is assets return rate, with regard to existing resources. Management is expected to use the current assets so that the maximum return is gained.

The present study aims at investigating assets return rate impact on stock prices of the companies accepted in Tehran stock exchange. In this research, assets return rate is considered as independent variable, and stock price as dependent variable, and company size, company age, and beta coefficient as control variables from 2001 to 2010. Research method is correlation in terms of hypothesis testing, and through multi-variable regression statistic analysis has been done. The research findings indicate strong impact and relationship between independent and dependent variables, and the research hypothesis has been accepted.

JEL Classifications: G12, G14

Keywords: Stock price, assets return rate, investment, company size

Introduction

Economic growth in any country depends on growth and development of capital and money markets; particularly money market which provides required funds of economic units in short and middle time. Investor persuading to gain further profits tries to get the most return on assets. It has made a good proportion of financial researches oriented toward predicting price or return of stock in different markets. The main resource which can convey a very rich and resourceful insight about information relevant to a given company and investor is principle financial statements of that company like balance sheet and retained earnings statement (Ala, 2005).

Research theoretical basics

One of the criteria to evaluate management power of a company for gaining return is rate of return on assets. A company's investors, even if the company has a good earning for them, put forth the question whether existing resources can bring about more interest for the company. Using the return on assets and comparing it with its former trend seem to be a good reply to this question. The former studies (e.g., Fairfield et al., 2003) proved the direct relationship between assets return rate and stock return.

Normally, studies which investigate on informational content variables surmise perfect accounting information reflection and then study the link between accounting variables

and market variables such as stock and return price (Zariffard and Nazemi, 2005). Majority of researches done in the past indicate the relationship among accounting variables, company features, and stock price. Gallizo and Salvador (2006) studied the degree of relationship among accounting variables and stock price. Their research aimed at determining accounting variables impact (particularly operating cash flow and bond value per share) on stock price. They used hierarchical procedure to conduct the research. The results of their research show that the company size and finance circulation ratio are among the most relevant effective factors on stock price. Rahgozar (2005) tested application of discounted cash flow, market-value-added, and multiplier methods in evaluating the existing companies in Dow Jones Industrial, Transportation, and Utility Averages. The results of his study show that there is notable difference between estimated values of stock prices and their actual prices. Dichev (1979) explored the degree of the relationship between accounting variables and stock market value of the company. He claimed that the more unpredictable a variable changes, the more relevant that variable is with stock market value. He examined four variables such as operating cash flows, profit before interest and tax, net income, and bond value as independent variables. The results of Dichev's study show that operating cash flows changes and net income are more unpredictable.

Bernard (1995) studied the relationship between accounting data and the companies' stock values. He put forth two models to predict stock market value, and compared explanatory power of these two models. The first model contained two independent variables such as bond value and profit, and the second model assumed only dividend as independent variable. Bernard's research results show that explanatory power of the first model is higher. He argues that the research results prove the relationship between accounting data and stock market value. To understand people' expectations of stock prices and profit, Antonides and Van Der Sar (1990) chose some people who were the members of independent authors clubs. They found out that the stocks, whose prices have recently decreased, have a lower risk. Ball and Brown (1968) measured accounting informational content in terms of market reaction to announced income and deviation of announced income from expected income. They used dividend per share and annual net income prediction error as accounting variables. Ball and Brown's research findings indicate correlation between accounting profits and stock market reaction (stock prices). Kordestani and Roudneshin (2006) investigated the degree of relevance of cash components of accounting profit with company's market value, and found out that profit operating cash flows (cash part) have predictability and explanatory power of the company.

Review of the related literature

In the 70s and 80s, a wide range of research has been conducted dealing with using accounting information. These researches put focus on two groups - investors and analysts. These works examine how much these two groups use accounting information to evaluate an economic unit performance. Biggs (1984), Ball and Brown (1968) conducted a lot of studies about using accounting information by financial analysts. Ball and Brown's research is the first research which point out the importance of accounting information. Ball and Brown (1968) investigated the relationship between annual profits and stock prices. Their observations showed that annual profit changes and stock price changes are related. As a result it can be said that accounting and its information are important and can play a crucial role in economic decisions.

Easton, Harris, and Ohlson (1992) investigated the relationship between accounting profit and stock return. Their research covered the accepted companies in New York stock exchange market from 1968 to 1986. They studied the relationship between stock return and accounting profit with the hypothesis that as time periods increase, correlation between these two variables increases too. They surmised that if time periods increase, the

number of mistakes will be decreased, and real profit of the company can be calculated. They used 1 to 10-year time periods. Their independent variable was EPS/P, and the results showed that in longer time periods, correlation between two variables increases, and profit justifies a much more amount of return.

Fama and French (1993) studied some differences of stock return average on market risk, company size, finance leverage, stock holders' salary bond value to market value, stock holders' salary and profit to price ratio by regression. They concluded that market risk and company size have no relationship with stock return average, but stock return average has indirect relationship with financial leverage bond value and has a direct relationship with financial leverage market. This relationship has been deemed as "dilemma" from Fama and French.

Basu (1977) believes that information of price/income ration does not reflect in stock prices and investment performance very fast, and generally it seems that stock equation in different profit coefficients has been priced incorrectly compared to another type of pricing and other chances obtained for "abnormal return" which has been provided for the investor. McMillan (2001) showed that there is a nonlinear relationship between stock return and variables which can be turned into simple linear transactions by logarithm models. The variables he considered in his model were interest rate, output indexes of performance evaluation like profit, stock holders' salary return, and assets return.

Omran and Ragab (2004), in a research on Egyptian companies concluded that in addition to linear relationship between financial ratios and stock return, there is a non-linear relationship among them. Chen and Zhao (2007) examined the factors influencing stock price and concluded that cash flows has the greatest impact on stock price, and there is a significant relationship among them.

Research methodology

Research method

The current research method is descriptive. In terms of hypothesis type, it is of correlation type, in which the relationship among variables is analyzed according to the research goal in which the impact of independent variable on dependent variable will be considered through regression. This research is of ex post facto, because former and proved information was used to determine the relationship among variables. The time period covers from 2001 to 2010. This time period has been chosen considering availability of verified information on financial statements and explanatory notes in Tehran stock exchange in this time period.

Statistical population

In this research, to choose statistical population a systematic elimination was used. The companies were selected using the following criteria and requirements:

- Only companies having manufacturing activities were selected; financial companies (insurance, leasing, banks, etc.) were excluded due to the difference in their investment activity;
- Only companies with stable financial performance were included. Companies were selected if their transactions from 2001 to 2010 in stock exchange were continuous. In other words, these companies stocks should be active during the time period, and break time should not be more than three months;

- The selected companies should posses the required information for calculating research variables about those companies including financial statements and descriptive notes during the research.

TABLE 1. SELECTED INDUSTRIES AND COMPANIES

Industry	Sub-field industries	Number of companies
Food industry	Food products and types of drinks	21
Chemistry industry	Products from purification, plastic and chemical materials	17
Metal industries	Making basic metals Making machines and classification equipment Machines and electric equipment of classification Motor vehicles trailer	25
Non-metal industries	Making other non-metal products	24
Wood and textile industries	Making wood and wood products Making paper and paper products Textile making	11

Statistical population of this research contains 98 qualified companies, and these companies' data has been used to test the hypotheses.

Based on presented classification by Tehran stock exchange, active companies have been classified in 23 industries (Table 1). During the study time the number of companies in some industries was limited, and there was no company in some industries; therefore, some companies belonging to close industries were considered in one set.

The hypotheses testing model

The following regression model was used to study the impact of assets return rate on stock price.

Equation (1)

$$P_{it} = \beta 0 + \beta 1\ ROA_{it} + \beta 2\ SIZE_{it} + \beta 3\ AGE_{it} + \beta 4\ BETA_{it} + \acute{\varepsilon}$$

Where, P_{it} is the stock price of the company i at time t, ROA_{it} is the company return on assets ratio at time t, $SIZE_{it}$ - size of company i at time t, AGE_{it} is the age of company i at time t, $BETA_{it}$ is beta coefficient of company i at time t, $\acute{\varepsilon}$ is error variable.

The variables such as company size, company age and beta coefficient serve in the equation as control variables. These variables data has been collected from Tadbirpardaz and Denasahm software packages. Assets return ratio is an important index to show the company income from amount of money invested; it is obtained by dividing net income of company on all assets.

Findings

First hypothesis testing

The first hypothesis is about finding out the fact that assets return rate impact on stock price of companies accepted in Tehran stock exchange is significant.

To test the above mentioned hypothesis, null hypothesis (H0) and alternative hypothesis (H1) are as follows:

H0 - the impact of assets return rate on stock price of companies accepted in Tehran stock exchange is not significant.

H1 - the impact of assets return rate on stock price of companies accepted in Tehran stock exchange is significant.

Testing regression classic hypotheses

The elementary premises of normal squares method are dependent variable normality, co-non-linearity among independent variables and stationarity of dependent and independent variables. Therefore, these three hypotheses will be tested.

Dependent hypothesis normality test

The main premise in the classic linear regression model is that independent variable should be distributed normally. Regarding this premise, estimators are distributed normally. In other words, dependent variable distribution normality is one of the basic premises of regression procedure. With regard to the crucial role of determination tests in results analysis, doing some tests to prove normality is of great importance. Dependent variable normality leads to normality of remaining of the model. To test data normality, Kolmogorov-Smirnov Test has been used. Null hypothesis and alternative hypothesis are defined as follow:

H0: data distribution is normal

H1: data distribution is not normal

TABLE 2. DEPENDENT VARIABLE (P_{IT})
NORMALITY TEST

Kolmogorov-Smirnov Z	.457
Asymp. Sig. (2-tailed)	.245

If the result in probability part is higher than 0.5, null hypothesis is accepted. Regarding P-value (0.245) at 95% significance level of, there is no adequate reason to reject H0. Therefore, we accept that the variable of stock price has normal distribution.

Studying co-linearity among model independent variables

Co-linearity usually exists among independent variables, but if we have much co-linearity, the model is not proper anymore. One of the procedures to test co-linearity is calculating correlation matrix. In this matrix, correlation coefficient between each couple of dependent variables is calculated. In normal distribution, to test co-linearity, Pearson correlation coefficient is used, otherwise, Spearman correlation coefficient is used. Because of normality of dependent variable distribution, Pearson correlation coefficient

was used. Non-co-linearity of dependent variables means that correlation coefficient between each couple of independent variables is zero. But practically, obtaining correlation coefficient of zero is impossible; correlation coefficient under 50% is acceptable. Fluctuations of co-linearity between independent variables are shown in Table 3. This table shows that each couple of independent variables does not have severe linearity and are separated from each other. The highest amount of co-linearity is between company size and beta coefficient which is 18%.

TABLE 3. CORRELATION MATRIX OF HYPOTHESIS INDEPENDENT VARIABLES

		ROA	SIZE	AGE	BETA
ROA	Pearson Correlation	1			
	Sig. (2-tailed)				
SIZE	Pearson Correlation	-.064	1		
	Sig. (2-tailed)	.254			
AGE	Pearson Correlation	.078	.136	1	
	Sig. (2-tailed)	.145	.365		
BETA	Pearson Correlation	.096	-.113	.176	
	Sig. (2-tailed)	.287	.289	.345	1

Testing variables stationary

Before using regression models in OLS methods, we should get assured of stationarity of variables, and stationarity of dependent variable variance. Therefore, ADF test is used. This test is done in Eviews software package.

The results of unit root Dickey-Fuller

The hypotheses of this test are as follows:

H0: the variable has unit root.

H1: the root has no unit root (the variable is stationary)

Tables 4 to 8 show the results of unit root tests for these hypothesis variables.

The results of Dickey-Fuller test show that all variables of the research are state. It means that in all cases absolute value of Dickey-Fuller statistic *t* is smaller than the critical values 0.01, 0.010, 0.05, which rejects non-stationarity of variable and accepts stationarity of H1. But because of serial correlation series in these time series, Philips Prone test is used.

TABLE 4. DICKEY-FULLER TEST RESULTS ON P_{IT} VARIABLE LEVEL

Null Hypothesis: P has a unit root			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.034567	0.0000
	1% level	-3.464643	
	5% level	-2.876515	
	10% level	-2.574831	

TABLE 5. DICKEY-FULLER TEST RESULTS ON ROA VARIABLE LEVEL

Null Hypothesis: ROA has a unit root			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.543673	0.0000
	1% level	-3.464643	
Test critical values	5% level	-2.876515	
	10% level	-2.574831	

TABLE 6. DICKEY-FULLER TEST RESULTS ON SIZE VARIABLE LEVEL

Null Hypothesis: SIZE has a unit root			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.112342	0.0000
	1% level	-3.464643	
Test critical values	5% level	-2.876515	
	10% level	-2.574831	

TABLE 7. DICKEY-FULLER TEST RESULTS ON AGE VARIABLE LEVEL

Null Hypothesis: AGE has a unit root			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.067890	0.0000
	1% level	-3.464643	
Test critical values	5% level	-2.876515	
	10% level	-2.574831	

TABLE 8. DICKEY-FULLER TEST RESULTS ON BETA VARIABLE LEVEL

Null Hypothesis: BETA has a unit root			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.123421	0.0000
	1% level	-3.464643	
Test critical values	5% level	-2.876515	
	10% level	-2.574831	

The results of Philips Prone unit root test

The results of Philips Prone show that all variables of the research are at the level of %10, %5, and %1.

LM self-correlation test

This test is used to determine whether error sentences are self-correlated or not. The results of this test in Table 9 show that self-correlation is not observed.

TABLE 9. SELF-CORRELATION TEST RESULTS

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.783456	Probability	0.176543
Obs*R-squared	3.234567	Probability	0.165464

Homoscedasticity testing (White test)

One of the most important classic linear regression model premises is that disturbance components have homoscedasticity. If the model has heteroscedasticity, *t*-statistic and F-statistic bring about false results. If errors variances are fixed and unlimited values, this premise is called homoscedasticity. If errors have no fixed variance, it is said that they have heteroscedasticity. In this research White test has been used to determine variance heteroscedasticity. In this test, null hypothesis and alternative hypothesis are as follows:

H0: there is variance homoscedasticity among error sentences.

H1: there is no homoscedasticity among error sentences.

This problem (variance heteroscedasticity) causes that OLS results are not the most effective anymore. The results of this test are as follows:

TABLE 10. FIRST HYPOTHESIS WHITE TEST RESULTS

White Heteroscedasticity Test:			
F-statistic	0.345678	Probability	0.556783
Obs*R-squared	2.435681	Probability	0.546789

As it can be seen, H0 accounting for variance homoscedasticity is accepted.

Regression model testing

We use two models. First model is at the level of all companies, and in the second model hypotheses is tested separately in each industry to see if the results in the general integrated five industries are the same as the results of each industry. Regression models

have been estimated by SPSS software, and then significance of regression model is compared at error level of 5%. If significance level is lower than 5%, at the given error level, model significance is proved.

After getting assured of lack of false regression, we try to estimate the following equation (1).

Analysing regression model at the level of all companies

The final result of regression at the level of all companies is as follows:

TABLE 11. FIRST HYPOTHESIS TESTING RESULTS: MODEL ANALYSIS AT THE LEVEL OF ALL COMPANIES

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.52E-05	0.000743	-0.060916	0.0314
ROA	0.677973	0.024513	11.33962	0.0000
SIZE	0.155240-	0.024501	6.336104-	0.0000
AGE	0.136210	0.035412	3.846477	0.0001
BETA	0.701221	0.017043	41.14308	0.0000
R-squared	0.680523	Durbin-Watson stat		2.009338
Adjusted R-squared	0.678438	Akaike info criterion		-4.898339
S.E. of regression	0.020858	Schwarz criterion		-4.880580
Residual sum of squares	0.341962	F-statistic		86.57420
Log likelihood	1935.395	Prob(F-statistic)		0.000000

F-statistic value is 86.57420 and its significance level is zero. Therefore, the above test proves the model. In other words, the whole of regression is significant. Determination coefficient indicates that 68% of dependent variable changes are based on independent variables changes and the remaining are caused by other factors which cannot be observed. The difference between determination coefficient and modified determination coefficient shows that the model independent variables have been chosen correctly.

Probability value dealing with null hypothesis accounting for being no relationship between independent variable of asset return ratio and dependent variable of stock price is lower than 0.05. Therefore, the hypothesis is rejected with 95% confidence. Independent variable coefficient is 0.678; it means that each unit of increase in independent variable of assets return ratio leads to 0.678 unit increase in dependent variable (stock price). Being positive this coefficient shows that there is a direct relationship between these two variables. That is, increasing ROA_{it} leads to P_{it} increasing. Being lower than 1 of this coefficient shows that if ROA_{it} increases or decreases 1%, P_{it} increases or decreases 1%. The results of analyzing regression model show that null hypothesis accounting for the idea that the impact of assets return rate on stock price of the companies accepted in Tehran stock exchange is not significant, is rejected and H1 is accepted.

Conclusion

The research hypothesis is presented as follows: the impact of assets return rate on stock price of companies accepted in Tehran stock exchange is significant.

The results of regression estimation at the level of all companies show that statistical null hypothesis which is accounting for lack of relationship between independent variable of assets return rate and dependent variable of stock price is rejected and research hypothesis is accepted. As it can be observed, estimated model has a high R^2 which means high explanatory power of independent variables. Estimated signs are theoretical and all coefficients are significant at 5% level.

These results show that when you are modeling stock price, assets return ratio can be used as an explanatory variable, and this variable has power of describing stock price. Therefore, our first hypothesis is accepted. Gallizo and Salvador (2006) show that there is no significant relationship between assets return rate and stock price, but the model obtained in this model proves a direct and very strong relationship between these two variables. The cause of this contradiction is found in the difference in time and place of doing these two researches. The results of Gallizo and Salvador's work prove an indirect and significant relationship between company size and stock price, which is because of abnormality of company size impact. The smaller company size (assets total logarithm), the more expensive its stock price and vice versa. So, descriptive analysis of these causes can be an issue to study about for the further researches.

Therefore, financial ratios can release some of the important realities of operation and financial condition of an economic unit easily and reveal relevant information. When investors give financial credits to the unit, they pay attention to this fact that how much the unit is able to repay the borrowed credit. Before giving financial facilities, banks and other finance institutes calculate relevant financial ratios and analyze them based on financial statements of borrowing units. The results obtained from this analysis are a main factor in making decision or rejecting the credit. The institutes providing financial services use financial analysis for classifying bonds of economic units (in terms of risk and credit). The current research aimed at studying the impact of assets return rate on stock price in the companies accepted in Tehran stock exchange. The findings reveal that ROA has a high correlation to stock price at the level of all industries, and it can be used as the main effective factor influencing stock price. In other words, regarding the strong impact of the given ratio on stock price in this research, the findings of testing this ratio can be used in financial statement users and investors' analyses as an index to compare with other stock indexes.

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