



Incorrect Pricing Impact on Investment and the Capital Structure of Companies with Financial Constraints

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ABSTRACT

The present study aimed to explore the impact of mispricing on capital investment and capital structure in companies with financial constraints. Methodology is descriptive-analytic with casual-comparative research type. Due to homogenization of statistical sample during research years, population was limited to companies were accepted in stock exchange before 2009 and attended till the end of 2014. According to entry criterion, 101 companies were selected by elimination method as the sample. Models by Trinugroho and Rinofah (2011) were used to analyze the research variables, and Kaplan and Zingales index was applied to indicate companies with financial constraints. Data collected by descriptive tests, Kolmogorov-Smirnov test and multi-variable regression. Results showed that there is negative and significant relationship between capital investment and cash flow. The impact of mispricing on capital investment in companies with high financial constraints is not more than companies with less financial constraints. There is reverse relationship between mispricing and debt ratio. The impact of mispricing on debt ratio in companies with high financial constraints is not more than companies with less financial constraints.

Keywords: Mispricing, Capital Investment, Capital Structure, Companies with Financial Constraints

JEL Classifications: C53, C5, E37, E32

1. INTRODUCTION

Studying the role of accounting gains to determine securities price is placed at the top of Finance and Accounting researches. These studies have been started and led to have many accounting researches giving theoretical issues and experimental tasks about relations between accounting gains and company value during recent four decades (Habib, 2008). Today, securities analysts, company managers and investors, all regard seriously company gains reports. News represents company gains less than what is expected, that can lead rapidly to stock price decrease. On the other hand, companies that meet the expectations of gains, they are granted rewards by market (Barth and Landsman, 1999). Accounting gains include accruals items and cash flows and they are considered as the most important given items of information in financial statements (Lev, 1989).

Accounting Standards Board believe that Finance reports mainly focus on accounting gains not cash flows, because given

information about company gains, that have been provided based on accrual accounting, is very important for companies in comparison to limited information of capital market. One of important performances in capital market is that companies need it as an intermediary to gain funds (Chang et al., 2007). Stock price will reflect fundamental components of company, but in fact stock price never completely reflect initial value of company, because of non-fundamental factors like investors behavioral biases (Lakonishok et al., 1994). Information asymmetry (Tobin, 1969), and systematic errors during stock assessment (Baker et al., 2003) cause stock price deviation of real or initial value (mispricing). This condition is effective on making decision about company investments. Manager can use overpriced stock as a fund for capital investment (due to less capital expenditure) and in contrast avoids from stock sales with low pricing, because capital expenditure is high. Stein (1996) believe companies have been over valued would tend to more overcapitalization. Because these companies include additional funds, they accept investment projects with negative net-present-value and otherwise these projects will not be accepted.

While less valued companies refuse to accept projects with positive net-present-value due to problems with supplying cheap sources and much capital expenditure (Trinugroho and Rinofah, 2011). Companies face with financial constraints when they observe gaps between domestic and foreign consumptions of allocating funds. Therefore, on the basis of this definition, all companies can be considered as companies with financial constraints but the levels of financial constraints are different. Using foreign funds can be an appropriate framework to separate companies based on their financial constraints rates. When there is more differences between domestic and foreign consumption in a company, the company has more financial constraints. Totally, companies which have no financial constraints or less financial constraints, are those which include assets with high liquidity and their net assets are very much (Kanani, 2007). According to the study by Baker et al. (2003), stock price movement is effective very much on capital investment in companies with more financial constraints than companies with less financial constraints. Therefore, this study uses financial information of accepted companies in Tehran stock exchange to explore the relationship among mispricing, capital investment and capital structure in terms of financial constraints. It is expected that studying this relationship and clarifying its vague items would increase market transparency when knowledge of investors is increased and cause more efficient allocations. Hence, the main issue is that does mispricing influence on capital investment and capital structure in companies with financial constraints?

2. LITERATURE

Gracolini et al. (2015), while they were studying about effect of financial leverage decisions and their impacts on risk and stock returns in USA, found debt would be declined if financial leverage increased and capital investment structure would be improved. Homayounnia et al. (2014) in a research about relationship between institutional investment and mispricing of accrual items in accepted companies of Tehran stock exchange found out when investors meet their expectations of quick incomes, they predict accruals items stability less than cash flow, then stocks would be priced by mistake. Rouhollahi et al. (2013), in a research about investors risk and mispricing impact found that B/V (risk and development agent) and V/M (investors mispricing agent) have significant and negative effect on accrual items. Furthermore, accrual items have negative and significant impact on stock quick returns and it represents that there is accrual items abnormality in Tehran stock exchange. There is significant relationship between B/V and this abnormality, but it is not observed for V/M. Khodapanah et al. (2013), in research about corporate governance in stock exchange via relationship between capital structure and property structure found out there is significant and negative relationship between capital structure (leverage) and property structure. Mojtahezade and Qodrati (2012) in a study about impact of accrual items irregularity on companies pricing found that accrual items are effective on stock returns and consequently on companies prices. Also, there is negative and significant relationship between accrual items income and stock returns. These results are still stable with controlling other effective factors on stock returns such as market risk, size and book ratio to market value.

Tobin (1969) showed that mispricing has positive or direct effect on companies investment, but it is not very different for companies with less or high financial constraints. Results, also, showed that funds selection is affected by mispricing in companies.

Elliot et al. (2008) found those companies with overpriced stocks, have turned to stock distribution and those companies with less or truly priced stocks continually have debts, which these results are consistent with market timing theory. Chang and et al. (2007) found that for companies depended on capital, regardless of companies' classification and due to financial constraints index, capital investment decisions were mostly affected by KZ index of corporate size, assessment changes index or incorrect assessment of stocks. Asten (1996) showed in a research that mispricing of stock market influenced on capital investment decisions and there was positive relationship between non-essential components of stock price and new investments rate.

3. METHODOLOGY

The method of present study is descriptive-analytic with casual-comparative research type. Independent variable happened in this type of study and it is impossible to manipulate it. It means that independent variable (mispricing) happened before and researcher is going to gain independent variable through dependent variable (investment and capital structure) by means of a retrospective study. Due to homogenization of statistical sample during research years, population was limited to companies were accepted in stock exchange before 2009 and attended till the end of 2014 and simultaneously include four features: In order to increase comparability, their fiscal period ended March and had no changes in activities or fiscal periods, they should not be defined as investing companies, banks, credit societies, other monetary institutes or financial intermediations, their information must be available and had no for more than 6 months during the period mentioned before. According to the constraints mentioned above, 101 companies (606 observations) would be selected as the final sample by elimination method. Finally, after data collecting, multi-variable regression test was used to examine theories.

3.1. Operating Definition of Variables

Mispricing index: This index is measured by a comparison of market value to actual book value and market value to estimating book value $\frac{M}{B_{pre}}$ and $\frac{M}{B_{Act}}$. It is argued that the result of market value to actual book value must reflect fundamental factors of company, but due to non-fundamental factors actual value may not be as it was expected, so difference between $\frac{M}{B_{pre}}$ and $\frac{M}{B_{Act}}$ can be applied as mispricing sign. This study follows the research by Trinugroho and Rinofah (2011) and $\frac{M}{B_{pre}}$ is formed based on fundamental factors including: Stock income, price to earnings ratio, stockholder equity return, return on assets, dividend payout ratio, price to sale ratio, price to cash flow ratio.

Model error is calculated by using panel method of component. Error component is considered as the criteria for mispricing.

Relation 1

$$\frac{M}{B_{i,t}} = \beta_0 + \beta_1 EPS_{t-1} + \beta_2 PER_{t-1} + \beta_3 ROE_{t-1} + \beta_4 ROA_{t-1} + \beta_5 DPR_{t-1} + \beta_6 PS_{t-1} + \beta_7 PFCF_{t-1} + \varepsilon_{i,t}$$

In which, $\frac{M}{B_{i,t}}$ is market value to book value and as a criteria for pricing and actual value of company.

EPS: Is the portion of profit after tax deduction to total number of stocks.

PER: Is share price ratio to share earnings ratio.

ROE: Is return ratio on stockholders equity.

ROA: Is return on total assets ratio.

PS: Is stock price market to sale ratio divided by numbers of shares.

PFCF: Is price to free cash flow ratio and it is calculated as follows.

Price to free cash flow ratio=stock price (issued shares/free cash flow).

Steps of sample classification based on financial constraints are:

A. Kaplan and Zingales criteria for calculating possibility of binary logistic regression variable.

KZ index is high for companies with high financial constraints and it is low for companies with less financial constraints. Companies that placed above (low) KZ index median are classified in levels of no financial constraints.

Relation 2

$$KZ_{i,t} = -\frac{1}{002} \times \left(\frac{Cash\ flow}{Total\ assets} \right) + \frac{0}{283} \times \frac{M}{B} + \frac{3}{139} \times Leverage - \frac{39}{368} \times \left(\frac{Div}{Total\ assets} \right) - \frac{1}{315} \times \left(\frac{Cash\ holding}{Total\ assets} \right)$$

$KZ_{i,t}$, Kaplan and Zingales index, is a common index for financial constraints that has been formed based on estimated coefficient of logistic regression. KZ index is a linear mix of five variables that affect companies' financial status and these variables are: Cash flow, market value to book value ratio, total debt to total assets ratio, dividends to total assets, net cash flow rate of cash flows in companies (Chang et al., 2005).

Cash flow: Net cash flow divided by total assets.

Cash holding: It is cash flow rate in a company and obtained from the sum of cash flow and short-term investments.

A. Estimating logistic regression model to predict financial constraints based on financial variables.

Relation 3

$$FC_i = Ln\left(\frac{P_i}{1-P_i}\right) + \alpha_0 + \alpha_1 PROFIT_{it} + \alpha_2 CR_{it} + \alpha_3 CP_{it} + \alpha_4 SLACK_{it} + \alpha_5 RE_{it} + \varepsilon_{it}$$

Relation 4

$$P_i = \frac{1}{1+e^{-z}} = \frac{e^z}{1+e^z}$$

Relation 5

$$Z = \alpha_0 + \alpha_1 FC_t$$

FC: Financial constraints and two-valued variable which are considered for companies with financial constraints (one) and companies with no financial constraints (zero). CR: Current ratio of total current assets divided by total current debts.

PROFIT: Operating profit for total assets of companies, CR (profit changes): Two-valued variable that is regarded one if profit increases over the previous year and zero if profit decreases.

SLACK: This variable represents working capital that is obtained from sum of (cash + short-term investment + inventory + claims) minus short-term debts divided by total assets.

RE: That is retained earnings of total assets, P: That is the possibility obtained from logistic regression and it represents company financial constraints, e: Is exponential rate.

In order to calculate financial constraints in terms of logistic regression method, first coefficients are estimated based on all observations, then financial constraints will be calculated on the basis of estimated coefficients and relations 4 and 5. If possibility was more than 50%, the company would be considered as companies with less financial constraints and it would be one, and if possibility was <50%, the company would be considered as companies with high financial constraints and it would be zero.

Capital investment: Investment expenditures would be calculated by below relation (Trinugroho and Rinofah, 2011).

Relation 6

$$INV_t = \frac{Investment\ cash\ flow}{Net\ fixed\ assets_{t-1}}$$

Investment cash flow: Are cash flows obtained from investment cash flows (cash flows derived from fixed assets sale and purchase) that have been used to measure net investment expenditures.

3.2. Net Fixed Assets

Capital structure: Debt to capital ratio is used for capital structure index.

Control variables: In addition to main variables, some control variables have been used in this study which it is expected to have influence on dependent variables. These variables are:

1. Leverage: Debt to total assets.
2. Cash flow: (Cash flow to total assets).
3. Cash (cash and near cash to total assets).
4. Sale (net sale to total assets).
5. Year (company lifecycle).
6. TAR (tangible fixed assets to total assets ratio).

3.3. Total Assets Size

1. Research theories.
2. There is a direct relationship between mispricing and capital investment.
3. Mispricing influence on investments in companies with high financial constraints more than companies with less financial constraints.
4. There is reverse relationship between mispricing and debt ratio.
5. Mispricing influence on debt ratio in companies with high financial constraints is more than companies with less financial constraints.

4. FINDINGS

Descriptive indexes of the research variables are presented in Table 1.

Table 2 shows survey results of relation 1 (market value to estimating book value model). F test gives desirable significant level of each coefficient and regression tests accuracy of theories represents a good description for dependent variable via independent variables and shows high validity for model. Due to coefficient and significant level of price to free cash flow ratio, this variable is excluded from the model.

Mispricing variable is calculated with real rates for company life-cycle in model $\frac{M}{B_{pre}}$. If the rates were positive, they represent that stocks of company have been assessed additionally and if the rates were negative, they represent that company stock have been less priced. By implementing these steps in the study, 93% of observations (565) were overpriced and 7 percent only (41 observations) were less priced.

Relation 7

$$INV_{i,t} = \lambda_0 + \lambda_1 MIS_{i,t-1} + \lambda_2 Cash\ flow_{i,t} + \lambda_3 Lev_{i,t-1} + \lambda_4 Cash_{i,t-1} + \lambda_5 Sale_{i,t} + \lambda_6 Age_{i,t} + \varepsilon_{i,t}$$

Investment (dependent variable) is elicited from relation 6 and mispricing (independent variable) is elicited from relation 1. Also cash flow, sale and year (company lifecycle) are considered as control variables. Statistical test results of first theory have been given in Table 3. As the table shows, mispricing coefficient (-0.187) based on significant level ($P < 0.001$) is < 0.05 that refuses theory zero about no relationship. Therefore, there is reverse and significant relationship between mispricing and capital investment.

Table 1: Descriptive indexes of the research variables

Variables	M	SD	Skewness	Elongation
INT	-0.287	0.856	-0.673	0.234
MIS	-0.019	0.509	0.076	-0.134
MIS*FC	-0.064	1.02	-1.567	10.34
LEV	1.654	0.634	1.213	7.012
Cash	0.056	0.054	2.678	9.129
Age	29.642	10.745	-0.234	-1.021
Cash flow	0.124	0.123	0.456	1.234
FC	-0.213	1.782	-0.579	1.132
D/E	2.156	1.204	2.112	11.456
TAR	0.156	0.157	1.234	1.654
SIZE	4.453	0.436	0.543	1.439

Table 2: Regression of predicting model for market value to book value

Variables	Coefficients	β	T	P value
Constant	-0.190		-2.123	0.0001
EPS	0.00234	2.321	3.561	0.001
P/E	0.034	1.241	8.012	0.001
ROE	0.0043	1.821	5.560	0.001
ROA	0.0112	3.214	2.021	0.001
DRR	0.195	1.082	2.843	0.02
P/S	0.261	1.745	2.012	0.04
PTFCF	-0.000015	1.012	90.432	0.6

Table 3: Relationship between capital and cash flow and other variables

Variables	Coefficients	T	P value
Constant	-0.257	-2.167	0.001
MIS	-0.187	3.561	0.001
Cash flow	-0.456	-2.563	0.001
LEV	0.67	1.126	0.14
Cash	-0.672	-1.213	0.15
Sale	0.123	0.867	0.21
Age	-0.0021	-0.876	0.2
MIS	-0.267	-2.167	0.001

It means that increasing mispricing reduces investment and vice versa. Also, there is negative and significant relationship between capital and cash flow and other variables such as financial leverage, cash, sale and year had no significant influence on capital investment. According to the model, F is significant for this theory ($P < 0.01$) and about 12.3% of investment changes are explained by independent variables.

Relation 8 shows second theory model.

$$\frac{D}{E_{i,t}} = \lambda_0 + \lambda_1 MIS_{i,t} + \lambda_2 \frac{M}{B_{i,t}} + \lambda_3 TAR_{i,t} + \lambda_4 Size_{i,t} + \varepsilon_{i,t}$$

Dependent variable (investment) is elicited from relation 6 and independent variable (mispricing) is elicited from relation 1. Also, TR variables (tangible assets to total assets ratio) and company size are considered as control variables.

Statistical test results of second theory have been given in Table 4. As the table shows, mispricing coefficient in companies with financial constraints (0.0021) accept theory zero about no influence ($P > 0.05$) because the significant level (0.51) is more than 0.05. Therefore, this theory is rejected with 95% confidence.

Table 4: Mispricing coefficient in companies with financial constraints

Variables	Coefficients	T	P value
Constant	1.167	5.450	0.001
MIS	1.231	11.010	0.001
M/B	0.021	0.238	0.72
TAR	-0.0161	1.126	0.16
SIZE	0.128	0.712	0.22

Table 5: Relationship between mispricing and debt ratio

Variables	Coefficients	T	P value
Constant	1.021	1.731	0.052
MIS	-0.021	-0.678	0.23
FC	0.178	14.210	0.001
MIS*FC	-0.021	-1.164	0.12
M/B	-0.016	2.490	0.001
TAR	0.194	1.453	0.23
SIZE	0.123	-1.410	0.56

So, mispricing effect on capital investment in companies with high financial constraints is not more than companies with less financial constraints. According to the model, F is significant for this story ($P < 0.01$) and about 2.4% of investment changes are explained by independent variables.

Relation 9 shows third theory.

$$D/E_{i,t} = \lambda_0 + \lambda_1 MIS_{i,t} + \lambda_2 M/B_{i,t} + \lambda_3 TAR_{i,t} + \lambda_4 Size_{i,t} + \varepsilon_{i,t}$$

Dependent variable (capital structure) is elicited from debt ratio to capital and independent variable (mispricing) is elicited from relation 1. Also, TR variables (tangible assets to total assets ratio) and company size are considered as control variables.

Statistical test results of third theory have been given in Table 5. As the table shows, mispricing coefficient (1.231) is < 0.05 based on the significant level (0.001). It refused the research theory about existence of relationship ($P > 0.01$). Therefore the theory is rejected with 95% confidence. So, there is no reverse relationship between mispricing and debt ratio. It means that increasing mispricing, would increase capital structure or vice versa. Also, there is no significant relationship between capital structure and control variable, market value to book value ratio, fixed intangible assets and size ratio. According to the model, F is significant for this theory ($P < 0.01$) and 42.7% of capital structure changes are explained by independent variables.

Relation 10 shows fourth theory model.

$$D/E_{i,t} = \lambda_0 + \lambda_1 MIS_{i,t} + \lambda_2 \times FC_{i,t} + \lambda_3 M/B_{i,t} + \lambda_4 TAR_{i,t} + \lambda_5 Size_{i,t} + \lambda_6 FC_{i,t} + \varepsilon_{i,t}$$

Dependent variable (capital structure) is elicited from debt ratio to capital, independent variable (mispricing) is elicited from relation 1 and two-valued independent variable (financial constraint) is obtained from relations 3-5. Also, TR variables (tangible assets to total assets ratio) and company size are considered as control variables. Statistical test results of fourth

theory have been given in Table 5. As the table shows, mispricing coefficient in companies with financial constraints (-0.021) accept theory zero about no relationship ($P > 0.05$) because significant level (0.23) is more than 0.05. Also, mispricing coefficient (independent variable) in companies with financial constraints equals to -0.021 and significant level is 0.1 that is more than 0.05. Therefore, the mentioned independent variable coefficient is not significant. Therefore, fourth theory is rejected. As a result, mispricing effect in companies with high financial constraints is not more than companies with less financial constraints. Also, two-valued variable coefficient of financial constraints is 0.178 and significant level (0.001) is $< 5\%$. Therefore, coefficient of financial constraint variable is positive and significant. It means that increasing financial constraints would increase debt ratio to capital and represent a direct relationship between this two variables. But there is no significant relationship between control variables (tangible assets ratio and company size), and dependent variable (capital structure). According to the model, F is significant for this theory ($P < 0.01$) and 74.8% of capital structure changes from debt ratio to capital ratio are explained by independent variables.

5. DISCUSSION AND CONCLUSION

Test results of first theory show that there is significant and reverse relationship between mispricing and capital investment. It means that increasing mispricing reduces investment or vice versa. Also, there is significant and negative relationship between cash flow and capital investment. This result contradicts the researches by Baker et al. (2003), Trinugroho and Rinofah (2011), Chang et al. (2007). This contradiction can be concluded that most factors which have been caused this difference and contradiction for many studies, theories, researches in other countries, is the difference in social, political and economic structure of systems, financial and economic development steps of various countries which lead differences between stock market and capital investment in those countries. Result of second theory show that the effect of mispricing on investment in companies with high financial constraints is not more than companies with less financial constraints. This finding contradict previous studies by Asten (1996), Baker (2003), Chang and et al. (2007) and Tringoho and Rinofah (2011). Agency theory can be used to describe similar reaction in both companies with financial constraints or without financial constraints. When stocks of companies are overpriced, managers are very motivated to increase investment because high price of stocks can be considered as optimistic opinion of investors about investing policy in company. Therefore, managers regard this process as their investing policy and hope to increase capital credit or fame and also to increase proper rewards for this recommend.

Results of third theory show that there is no reverse relationship between mispricing and debt ratio. It means that increasing mispricing can increase capital structure or vice versa. This finding contradict previous studies by Tobin (1969), Tringoho and Rinofah (2011). This contradiction is due to difference in social systems, policy, economic structures which lead to differences between stock market and capital investment in those countries.

Results of fourth theory show that the effect of mispricing on debt ratio in companies with high financial constraints is not more than companies with less financial constraints.

Also, two-valued variable coefficient of financial constraints (0.178) and significant level (0.001) is <5%. Therefore, coefficient of financial constraint variable is positive and significant. It means that increasing financial constraints can increase debt to capital ratio in a company and it represents a direct relationship between these two variables, this finding is consistent with researches by Tobin(1969), Tringoho and Rinofah (2011).

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