

## The Effect of Information Asymmetry on Financial Constraints of Listed Firms on Tehran Stock Exchange

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**Abstract:** In the present research we have investigated about the effect of information asymmetry on financial constraints. In this study we have used accruals quality and bid-ask spread as a criterion to measure information asymmetry. Also  $KZ_{IR}$  index has been used to measure financial constraints. To answer the research questions, one main and two sub-hypothesis were devised and 130 firms enlisted in Tehran Stock Exchange within the time period between 2009 and 2014 were selected to test the hypotheses. The research method was descriptive and correlation type. Also to test the hypotheses we have used multiple linear regression models with panel data and fixed effects. The research results showed that accruals quality and bid-ask spread have had a positive and meaningful effect on financial constraints. Thus, the present research achieved some evidences showing that the main hypothesis was approved claiming that information asymmetry have had a positive and meaningful effect on financial constraints.

**Key words:** Information asymmetry, accruals quality, bid-ask spread, financial constraints,  $KZ_{IR}$  index

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### INTRODUCTION

The supply of financial resources for long-term investments forms the main part of firms' managers' concerns. According to Modigliani and Miller (1958) firms' financial structure including different financing resources does not have any effect on firms' investment decisions. This theory exists when there is an efficient capital market where internal and external resources have an appropriate alteration capability. But, practically capital market can not be completely efficient (Francis *et al.*, 2013).

Information asymmetry between managers and investors is calculated by the difference between demand for reporting (by investors) and the amount of financial information disclosure (by managers). On the whole, when there is information asymmetry, the investors do not have enough trust to firm's managers and demand more return rates to finance for investment projects. On the other hand, investors have less information about firms' economic conditions and in many cases they assess investment risk in firms more than the real amounts. Finally, financing through external resources (stock issuance, bonds) incurs lots of costs and it increases the cost of financing to an amount higher than the nominal return rate announced. These factors makes other firms tend to use internal resources more and more to finance

for their investments. A firm that encounters more problems in accessing external resources of capital market supplies a greater part of financial resources needed from resources within the firm. Such a firm is technically called 'a firm suffering from financial constraints'. The amount of reliance of a firm on internal resources is determined through investment sensitivity, cash flow of the firm. Accordingly, the higher investment sensitivity to cash flow in a firm will result in more reliance on internal resources and the firm will encounter more financial constraints (Sitthipongpanich, 2013).

### Literature review

**Theoretical foundations and research literature:** The authors of the very first agency theory (Spence and Zeckhauser, 1971), tried a lot to introduce the basic pattern for agency theory. Agency theory starts with the presupposition that people act to preserve their own benefits and it entails the fact that in ordinary conditions, goals, benefits and dangers of the two parties (owner and agent) are not the same. This theory states that when a manager does not have 100% ownership of the stocks of the firm, inevitably there would be a hidden controversy among the stockholders and the manager. This results in several agency problems such as controversy among stockholders and manager, moral hazards, distrust and participation risk (Namazi, 2005), information asymmetry

among stockholders and manager and making undesirable decisions (Jensen and Meckling, 1976). But, when there are capital market faults, there would not be a complete alternate between internal and external cash resources. More precisely, the difference can be resulted from contract problems, agency costs and information asymmetry among the internal and external organization investors.

These controversies in benefits generates the required incentive for management to optimize the resources and it results in some moves (for example financial statement deviation) and this results in loses for investors in most cases. In such a case, the investors do not have enough trust to firm managers and demand higher return rates to finance for investment projects and finally this leads to finance through resources out of the firm (stock issuance, bonds) that incur lots of costs and it causes financing costs to be higher than the nominal return rate announced. These factors force firms to use internal resources to finance for their investments (Hovakimian and Hovakimian, 2009). In such conditions the existence of control mechanism that relatively guarantees the transparency of information reported in financial statements seems to be necessary.

Ascioglu *et al.* (2008) the effects of information asymmetry on investment cash flow sensitivity were examined. The findings show that, information asymmetry have had a positive and meaningful effect on investment cash flow sensitivity. In the other words, with increasing information asymmetry is reduced access to external financial resources and firms to invest at least lead.

Bao *et al.* (2012) investigated about the amount of sensitivity of cash flows regarding the amount of financial constraints and also information asymmetry among owners and managers. Results showed that the higher amount of information asymmetry will result in higher sensitivity of cash flows and this can affect financing method and the use of financial resources out of the organization.

Mansour (2014) investigated about the relationship between information asymmetry and financial constraints. Their findings showed that there has been a positive relationship between information asymmetry and financial constraints. In other words, by increasing information asymmetry there would be less access to firm's external resources.

Rasaeian *et al.* (2014) investigated about the amount of sensitivity of cash flows when there was information asymmetry. Results of their research showed that information asymmetry affected the amount of sensitivity of cash flows and its amount has been more than information symmetry because information asymmetry increases the opportunity on the part of the managers to preserve their personal benefits and it has an excessive effect on sensitivity of cash flows.

**Research hypotheses:** When there is information asymmetry, managers have access to more and better information compared to the market due to having private and confidential information about the firm. In this case the financial resource suppliers demand higher return rates and thus firms' financial constraints increase. Thus, the following hypotheses were devised here:

**Main hypothesis:** Information asymmetry has a meaningful effect on financial constraints.

**First sub-hypothesis:** Accruals quality has a meaningful effect on financial constraints.

**Second sub-hypothesis:** Bid-ask spread has a meaningful effect on financial constraints.

## MATERIALS AND METHODS

**Research method and data collection:** The present study has been applied regarding goal and a descriptive research regarding the nature emphasizing at correlation relations because on the one hand it has investigated the present status and on the other hand, it has identified the relationships between different variables through a regression analysis. Additionally, it falls within post-incident studies realm (by using past data) and it has been based on real information in firms' financial statements.

**Statistical population, sampling method and sample size:** The statistical population of the present research included all firms enlisted in Tehran Stock Exchange for the time period between 2009 and 2014. About 130 firms were selected as our sample by using a screening method.

**Research variables:** The variables in the present study were divided into three groups of independent, dependent and control variables.

**Dependent variable:** In this research, financial constraints were considered as the dependent variable.

**Financial constraints:** To know that a firm has financial constraints or is not encountering it, we use  $KZ_{IR}$  index. Tehrani and Hesarzadeh (2009) posed the model presented by Kaplan and Zingals regarding the coordinates in Iran as follows:

$$KZ_{IR} = 17.33 - 37.486 (CH_{it}/A_{it}) - 15.216 (Div_{it}/A_{it}) + 3.394 (Lev_{it}) - 1.402 (MTB_{it})$$

Where:

- Ch<sub>i,t</sub> = Cash holding of firm i in year (t)
- Div<sub>i,t</sub> = Dividends of firm i in year (t)
- Lev<sub>i,t</sub> = Financial leverage of firm i in year (t)
- MTB<sub>i,t</sub> = The ratio of market value to book value of equity of firm i in year (t)
- A<sub>i,t</sub> = Assets of firm i in year (t)

We have used KZ<sub>IR</sub> index to calculate the numerical value of each firm-year. The higher amount of the calculated number showed more financial constraints.

**Independent variables:** In this research, information asymmetry was considered as the independent variable. Information asymmetry. In the present study, we have used accruals quality and bid-ask spread to calculate information asymmetry.

**Accruals quality:** The quality of accruals is the closeness degree of firm's earnings to the amount of cash flows created. To calculate the quality of accruals we have used a model posed by Francis *et al.* (2013) as follows:

$$[WCA] \downarrow (i, t) / [AA] \downarrow (i, t) = \beta \downarrow 0 + \beta \downarrow 1 [CFO] \downarrow (i, t - 1) / [AA] \downarrow (i, t) + \beta \downarrow 2 [CFO] \downarrow (i, t) / [AA] \downarrow (i, t) + \beta \downarrow 3$$

Where:

- WCA<sub>i,t</sub> = Working capital accruals of firm i in the year t that is equal to the changes in current assets minus changes in cash, equals of cash and changes in current debts
- CFO: = Cash flow resulted from operating activities of firm i in year t-1 and t+1
- ΔRevenues<sub>i,t</sub> = Changes in sales revenues of firm i between the years t and t-1
- PPE<sub>i,t</sub> = Properties, machines and equipments of firm i in the year (t)
- Aa<sub>i,t</sub> = Average of total assets of firm i in the year (t)
- |L<sub>i,t</sub>| = The bigger absolute number of accruals quality means higher information asymmetry

**Bid-ask spread:** The bid-ask spread is measured based on the difference between the closing bid and the ask price divided by the average of the closing bid and the ask price. To calculate the bid-ask spread we have used a model posed by Venkatesh and Chiang (1986) as follows:

$$Spr_{i,t} = \frac{(AP_{i,t} - BP_{i,t})}{\frac{AP_{i,t} + BP_{i,t}}{2}}$$

Where:

- Spr<sub>i,t</sub> = Bid-ask spread of firm i in the year (t)
- AP<sub>i,t</sub> = Average of the ask price of firm i in the year (t)
- BP<sub>i,t</sub> = Average of the bid price of firm i in the year (t)

**Control variables:** The control variables in this research were firm size and leverage as described below:

**Firm size:** To determine firm size, different indexes have been used in different researches. Kroes and Manikas (2014) used Abor (2008) sales' logarithm of the logarithm of total assets and Naceur *et al.* (2006) used the logarithm of capital's market value. In this research we have used natural logarithm of total assets to determine firm size.

$$Size_{i,t} = Ln (A_{i,t})$$

Where:

- Size = Size of firm i in the year (t)
- Ln = Natural logarithm
- A = Total assets of firm i in the year (t)

**Leverage:** Leverage refers to the amount and size through which a firm could have financed through loans or debts. Debt ratio is one of the most important indexes of leverage that is calculated by dividing debts into assets (Bozorg-e-Asl, 2006). The way to calculate leverage has been shown below:

$$Lev_{i,t} = L_{i,t} / A_{i,t}$$

Where:

- Lev<sub>i,t</sub> = Leverage of firm i in the year (t)
- L<sub>i,t</sub> = Total liabilities of firm i in the year (t)
- A<sub>i,t</sub> = Total assets of firm i in the year (t)

**Research models:** To test the hypotheses we have used the following regression models:

$$FC_{i,t} = \beta_0 + \beta_1 AQ_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + [i,t]$$

$$FC_{i,t} = \beta_0 + \beta_1 Spr_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + [i,t]$$

Where:

- FC<sub>i,t</sub> = Financial constraints of firm i in the year (t)
- AQ<sub>i,t</sub> = Accruals quality of firm i in the year (t)
- Spr<sub>i,t</sub> = Bid-ask spread of firm i in the year (t)
- Size = Size of firm i in the year (t)
- Lev<sub>i,t</sub> = Leverage of firm i in the year (t)
- ε = Model errors

**RESULTS AND DISCUSSION**

**Research findings**

**Descriptive statistics:** Descriptive statistics of research variables for sampled firms are presented in Table 1.

**Testing research hypotheses**

**Model selection test:** Table 2 represents the findings related to model selection for each subordinate hypothesis related to main hypothesis.

As observed above, the significance level of Chow test is lower than accepted level of error (5%) in first and second sub-hypothesis, so hypothesis zero is rejected based on equality of intercepts and the other hypothesis is accepted. As a result in this step, a panel model-fixed effects must be tested against panel model-random effects. This test is conducted through Hausman test as presented in Table 3.

As observed above, the significance level of Hausman test is lower than accepted level of error (5%) in first and second sub-hypothesis, so hypothesis zero is rejected and the other hypothesis is accepted. This quantity shows that the method of fixed effects must be used. In rest, a regression test through panel data-fixed effects must be conducted.

**Main hypothesis:** In order to test our main hypothesis, each variable was considered in a separate secondary hypothesis to find the relationship between one of the variables of information asymmetry (accruals quality and bid-ask spread) with financial constraints. The results of testing secondary hypotheses are presented in Table 4.

The identification coefficient of the models showed that 50.9 and 61% of the changes in financial constraints can be identified through variables entered into the model. Also, regarding that significance level of f-statistics is <0.05 (0.000) the meaningfulness of model is confirmed with 95% certainty. Durbin-Watson statistics is estimated between 1.5-2.5, so the independency of model residuals are confirmed too.

As observed above, significance level of t-statistics of first and second sub-hypothesis also indicate that accruals quality and bid-ask spread have had a positive and meaningful effect on financial constraints. So the main hypothesis “information asymmetry have had a positive and meaningful effect on financial constraints” is accepted.

In most managerial and financial decisions, financial constraints are considered as the important and effective factors in decision making and considering this criterion is highly important. Those firms are called financially constrained that have low and costly access to financing through external resources. Information asymmetry and agency problems were among the main reasons of differences between internal and external financing costs mentioned in this research (Francis *et al.*, 2013).

Information asymmetry refers to lack of the same access of all participants in the market. For example, people within an organization have more detailed information about the strategic decisions in a firm and they do not present it for the external investors.

Table 1: Descriptive statistical data of research variables

Variables	FC	AQ	Spr	Size	Lev
Mean	13.01423	0.040527	0.019663	13.74452	0.586473
Median	13.95992	0.031369	0.019128	13.60901	0.606174
Maximum	47.30791	0.195961	0.045461	18.53182	1.000000
Minimum	-13.65062	0.000240	0.000000	10.03122	0.058969
SD	4.714405	0.035294	0.011244	1.415583	0.182196
Skewness	-1.713732	1.559380	0.086768	0.685719	-0.250780
Kurtosis	14.56832	5.728962	1.955640	4.286568	2.650219
Observations	780	780	780	780	780

Table 2: The results of model selection for testing each hypothesis

Variables	t-test	Main hypothesis		Suitable model
		F-statistic	Sig.	
First sub-hypothesis	Chow test	14.825777	0.0000	Panel
Second sub-hypothesis	Chow test	16.510183	0.0000	Panel

Table 3: The results related to model selection for testing each hypothesis

Variables	t-test	Main hypothesis		Suitable model
		F-statistic	Sig.	
First sub-hypothesis	Hausman test	157.129165	0.0000	Fixed effects
Second sub-hypothesis	Hausman test	167.693068	0.0000	Fixed effects

Table 4: Results of regression models estimation to test the main hypothesis

Variables	First sub-hypothesis				Second sub-hypothesis			
	Coefficient	SE	t-statistics	Sig.	Coefficient	SE	t-statistics	Sig.
y-intercept	0.234369	0.052582	4.457209	0.0000	0.286490	0.052888	5.416919	0.0000
Information asymmetry indexes	0.703624	0.170378	4.129782	0.0000	5.186735	0.830676	6.243993	0.0000
Firm size	-0.019816	0.004771	-4.153426	0.0000	-0.027355	0.006358	-4.302246	0.0000
Leverage	0.244460	0.087839	2.783052	0.0055	0.212571	0.059740	-3.558267	0.0004
Adjusted R <sup>2</sup>	0.509266	-	-	-	0.610442	-	-	-
F-statistics	18.14727	-	-	-	23.05507	-	-	-
Sig.	0.000000	-	-	-	0.000000	-	-	-
Durbin-Watson	1.795537	-	-	-	1.749681	-	-	-

Information asymmetry results in risk and information dangers for financial resource suppliers. Financial resource suppliers consider some benefits for financing in return to the information risk they incur. For example, if they want to give money to the firm, they demand higher interest rates or if they want to purchase more stocks issued by the firm, they would assess the stocks lower and would buy the stocks issued by the firm with a lower price. Finally information asymmetry resulted in increasing financial constraints and firms were led towards least investment (Luo *et al.*, 2015). The result of main hypothesis is consistent with (Ascioglu *et al.*, 2008; Bao *et al.*, 2012; Mansour, 2014).

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