

A Study of the Effect of Accounting Quality on Method of Financing: Evidence from Iran

Mahdi Salehi

*Assistant Professor of Accounting
Ferdowsi University of Mashhad, Iran
E-mail: mahdi_salehi54@yahoo.com*

Abolfazl Kholousi

*Neyshabur Branch, Islamic Azad University
Neyshabur, Iran*

Abstract

Current study investigates the effect of accounting quality on investment restrictions and the methods of financing in companies listed in Tehran Stock Exchange during 2005-2010. Therefore, the hypotheses have been analyzed throughout the investment model obtained from the total capital expenditure of companies as the investment and accounting quality which is resulted from discretionary accrual of Jones model. The statistical results obtained by endogenous switching method and ordinary least square in the research indicates that there is a negative and significant relation between the accounting quality and the investment cash-flow sensitivity, in other words, the investment cash flows sensitivity is decreased due to the improvement of accounting quality, thus the financial restrictions are also reduced. Then, the effect of accounting quality on the amount of bank credits and capital rises for financing have been studied separately and without consideration of controlling variables which results indicate that the amount of bank credits are increased because of higher accounting quality, whereas, there is no significant relation between the accounting quality and capital rising.

Keywords: Accounting Quality, Investment, Discretionary Accrual. Private Information, Bank Credits

1. Introduction

Growing body of evidences indicate that better accounting quality can reduce costs and financing constraints. Prior studies suggest that higher quality financial reporting increases investment efficiency (Beatty et al. 2009). In addition, quality of financial reporting is associated with investment efficiency due to the reduction in over- and/or under-investment and also higher financial reporting quality reduces the information asymmetry that causes frictions such as moral hazard and adverse selection, and thus is positively associated with investment efficiency (Biddle et al. 2009). Therefore, Financial Accounting Standards states that one objective of financial reporting is to inform present and potential investors in making rational investment decisions and in assessing the expected firm cash flows (1978). Furthermore, Beatty et al. (2009) concluded that improved accounting quality decreases investment-cash flow sensitivities for firms that issue either public debt or bank debt. They also found that

investment restrictions eliminate the influence of accounting quality on the investment-cash flow sensitivity.

We extend the study by examining how investment is sensitive to internal cash flows and the investment-cash flow sensitivity is lower for firms with higher accounting quality. Thus, we measure of accounting quality by modified Jones model 1995, and then by investment model the effect of accounting quality on cash flow investment sensitivity are investigated. The statistical results obtained by both our OLS and endogenous switching model regressions shows investment restrictions reduce the investment-cash flow sensitivity and this is consistent with Beatty et al. (2009).

Debt financing is a predominant source of new external funding for companies and borrowers with credit ratings toward the middle of the spectrum rely on bank loans, and in periods of high interest rates or low future profitability, higher-rated borrowers choose to borrow from banks (Diamond, 1991). Therefore, we examine how accounting quality affects borrower's choice of private debt versus capital rising. Accounting quality affects the choice of the market, firms with the highest credit quality borrow from public sources, firms with medium credit quality borrow from banks, and firms with the lowest credit quality borrow from non-bank private lenders (Denis and Mihov, 2002). This is consistent with banks possessing superior information access and processing abilities which reduce adverse selection costs for borrowers Bharath et al. (2008).

2. Literature Review

Access to private information and direct restrictions on investments are likely to affect the extent to which accounting quality reduces financing constraints. They results suggest that for financially constrained firms, banks' access to private information decreases the value of accounting quality (Beatty et al. 2009).

Almeida et al. (2004) found that constrained firms display significantly positive cash-cash flow sensitivities, while unconstrained firms do not. The exact opposite results obtain for the KZ index. Furthermore, higher accounting quality should enhance investment efficiency by reducing information asymmetry between managers and outside suppliers of capital Almeida et al. (2004). The effect of higher quality accounting on investment-cash flow sensitivity should be stronger in economies where financing is largely provided through arm's length transactions and also predict a stronger (weaker) relation between accounting quality and capital investment efficiency in countries with predominant equity (bank) financing of firm-level capital investment (Biddle and Hillary, 2006). Investment is more sensitive to cash flow for the group of firms that our model implies is most likely to face external finance constraints (Fazzari et al. 1987). What is more; different sources of financing affect the importance of accounting quality on firms' investment-cash flows sensitivity. Firstly, investment cash flows sensitivity is associated with both under investment when cash flows are low and overinvestment when cash flows are high. Secondly, our analysis also shows that firms with higher investment-cash flow sensitivity have characteristics that are traditionally associated with tighter financial constraints, such as smaller size, lower likelihood of paying dividends or having investment grade debt rating Hovakemian and Hovakemian, 2009).

Poorer AQ is associated with larger costs of debt and equity. This result is consistent across several alternative specifications of the AQ metric. They also distinguished between accruals quality driven by economic fundamentals (innate AQ) versus management choices (discretionary AQ). Both components have significant cost of capital effects, but innate AQ effects are significantly larger than discretionary AQ effects (Francis et al. 2005). In addition, Accruals quality, are negatively associated with both firm underinvestment and overinvestment. The relation between financial reporting quality and underinvestment is stronger for firms facing financing constraints, consistent with the argument that financial accounting information can reduce the information asymmetry between the firm and investors. Verdi realized that the relation between financial reporting quality and investment efficiency is stronger for firms with low quality information environments (Verdi, 2006).

Talebian (2008) found evidences that cost of capital (cost of debt and equity costs) in companies with lower quality accruals is higher than the cost of capital in companies with high quality accruals. Musavishiry (1999) has shown that audit report is influential in enhancing the quality of reporting. Furthermore, in 2005 Mashayekhi et al. (2005) studied the optional undertaking items in cash fund gained from operations of Tehran Stock Exchange; the results of their researches indicated that there was a negative and significant relation between these two variables.

3. Data and Methodology

This study is inductive and it makes use of past information and historical financial statements. The current study is also correlative since it seeks to investigate the relation between dependent and independent factors. It is a periodic study because it studies a specific period of time and it can be an applied research. Independent and dependent variables and primary processing of data were carried out by Excel. The assumptions of the research are tested based on the regression analysis with the aid of SAS and SPSS statistical analysis software. In order to gather theoretical information, library research was selected and the books in the libraries, together with articles found in the internet, were used. An empirical research was used to describe the events in Tehran stock exchange (TSE) and investigate the correlation of variable by regression analysis. The TSE listed companies were chosen as a population and then some samples were selected based on the following conditions:

The present research was conducted on 87 companies listed in Tehran Stock Exchange which were operating in the primary market during 2005-2010 and had high rank concerning the quality of information disclosure, were employed. One of the factors that only companies in primary market were used was that they had a higher standing from the viewpoint of financial and credit capacity in comparison with other markets such as the secondary market and OTC market. They mainly have heavier bank loans and more capital compared with other markets.

- 1) The companies should be listed before 2004.
- 2) Date financial firms should lead to the end of March each year.
- 3) The companies should be activated during 2005 to 2010.
- 4) The companies should not change their financial periods.
- 5) The companies availability of information is required.

3.1. Hypotheses of the Study

According to the research these hypotheses arise:

H₁: Increasing the Accounting Quality reduces the Sensitivity of Cash Flows Investment.

H₂: Increasing the Accounting Quality increases financing from credits.

H₃: There is a significant relation between increasing the Accounting Quality and Capital Rising

3.2. Investment Model

We test our hypotheses about the effects of accounting quality, and banks' private information on the investment-cash flow sensitivity by estimating the following investment model:

$$\text{Investment} = \alpha + \beta_1 \text{AQ} + \beta_2 \text{CFO} + \beta_3 \text{CFO} * \text{AQ} + \beta_4 \text{Size} + \beta_5 \text{Leverage} + \beta_6 \text{Tangibility} + \beta_7 \text{ROE} + \varepsilon$$

We measure the extent of the firm's investing activities, *Investment*, as the total capital expenditures of the firm. We measure cash flows, *CFO*, as the cash flows from operations since it excludes accruals that may be correlated with investments. If firms' investments are sensitive to their internal cash flows then we would expect a positive coefficient on the *CFO* variable. Higher accounting quality should reduce the information problems that lead to the investment-cash flow sensitivity, so we expect the coefficient on *CFO*AQ* to be negative. We also include control variables

for other factors that are likely to affect the firm's investment choices. In addition, we control for *Size*, and *Leverage*. Smaller firms, more levered firms are expected to have fewer investments. Finally, we also include controls for the tangibility of the firm's assets *Tangibility*, and firm performance, *ROE*, but we do not make explicit predictions on the effect of these variables on investment.

To test hypothesis 1, we compare the coefficients on *CFO*AQ* across capital rising versus bank debt samples. We hypothesize that the coefficient on *CFO*AQ* should be lower in the bank debt sample if private information and accounting information serve as substitutes and should be higher if these sources of information are complements.

Since the choice of issuing bank debt versus public debt is likely to cause a self-selection bias in OLS regressions, we estimate an endogenous switching model that controls for the selection problem associated with the debt-financing source.

To control for the endogeneity of the choice of bank debt and capital rising and also measure private information's effect on the relationship between accounting quality and investment-cash flow sensitivities; we compare sub-samples of firms with capital rising versus bank debt. The bank debt sub-sample refers to firm years with at least one syndicated bank loan outstanding.

3.3. Bank Debt Model

The aim of this model is emphasis on each of the independent control variables on amount of funding by means of bank debt. For instance, companies with higher accounting quality have more profitability and more chance for funding by bank debt. Owing to the important role of financial constraints in investment decisions, especially in funding through the credits; we follow Whited and Wu (2004) and include *DivPos* as an instrumental variable (Whited and Wu, 2004).

$$\text{Bank} = \alpha + \beta_1 \text{AQ} + \beta_2 \text{CFO} + \beta_3 \text{ROE} + \beta_4 \text{Size} + \beta_5 \text{Leverage} + \beta_6 \text{DivPOS} + \varepsilon$$

Now the impact of accounting quality on method of funding are investigated separately and the link between accounting quality and method of funding by capital rising and bank credits should be studied without other variables.

$$\text{Debt Bank} : \alpha_0 + \alpha_1 \text{AQ} + \varepsilon$$

$$\text{Capital Rising} : \alpha_0 + \alpha_1 \text{AQ} + \varepsilon$$

3.4. Variable Definitions

Investment: the firm's total capital expenditures divided by total average assets

Bank: a dichotomous variable that is set equal to one if the firm issues bank debt during our sample period and 0 otherwise.

AQ: Accounting Quality based on discretionary accrual is achieved by the difference in discretionary accrual and cash flow operation.

CFO: cash flow from operations divided by average total assets.

ROE: net income divided by average shareholders' equity.

Size: the log of total assets

Leverage: long-term debt divided by the sum of long-term debt and market value of equity.

Tangibility: Almeida and Campello's (2007) estimate of asset tangibility: $0.715 \times \text{accounts receivable} + 0.547 \times \text{inventory} + 0.535 \times \text{PPE} + \text{cash}$ divided by total assets.

DivPos: an indicator that takes the value of one if the firm pays cash dividends.

3.5. Discretionary Accrual

Discretionary accrual is obtained by difference in total accrual and non- discretionary accrual. Therefore, we use Variance inflation factor¹, because it provides an index that measures how much the variance (the square of the estimate's standard deviation) of an estimated regression coefficient is increased because of collinearity. According to this factor, it may be said that the factor of variance inflation more than 10 indicates strong collinearity among variables and less than 5 shows lack of collinearity among independent variables and because all the values of variance inflation factor were obtained near 1, therefore, there was not collinearity among the independent variables. Considering the table for estimating the regression coefficients, regression model is obtained as follows:

$$TA_{it} = 71906.201 \left(\frac{1}{A_{it-1}} \right) + 0.001 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} \right) - 0.444 \left(\frac{PPE_{it}}{A_{it-1}} \right)$$

$$DNA_{it} = TA_{it} - \left(71906.201 \left(\frac{1}{A_{it-1}} \right) + 0.001 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} \right) - 0.444 \left(\frac{PPE_{it}}{A_{it-1}} \right) \right)$$

3.6. Calculating Accounting Quality based on Discretionary Accrual

The accounting quality on the basis of discretionary accrual is the residual of the regression of Discretionary Accrual on cash flow operation which is calculated based on the following model:

$$\varepsilon_{it} = DNA_{it} - (0.040 - 0.014 CFO_{i(t-1)} + 0.180 CFO_{it} - 0.159 CFO_{i(t+1)})$$

In analyzing these models, the companies were classified into two groups on the basis of their financing through capital rising and their bank credits.

Table 1: Estimation parameter

Capital Rising in Investment model				Bank Credits in Investment model		
Factor	p-value	t-value	Coefficients	p-value	t-value	Coefficient
<i>Intercept</i>	0.203	1.307	0.467	0.079	-1.764	-0.358
<i>AQ</i>	0.009	-2.855	-0.232	0.019	-2.366	-0.125
<i>CFO</i>	0.000	5.084	0.957	0.003	2.996	0.321
<i>CFO * AQ</i>	0.166	1.426	-0.666	0.000	3.834	0.949
<i>Leverage</i>	0.182	1.373	0.168	0.001	3.457	0.293
<i>Size</i>	0.282	-1.101	-0.063	0.010	2.591	0.083
<i>Tangibility</i>	0.001	-3.614	-0.692	0.591	0.537	0.026
<i>ROE</i>	0.031	2.291	0.367	0.012	-2.538	-0.170

3.7. Bank Credits in Investment Model

Firstly, we analyze the pertinence of the model by analyzing the variance inflation factor; we observe that all its values (which are between 1.059 and 1.555) indicate the lack of collinearity among the independent variables. Durbin-Watson statistic (1.34) shows lack of correlation among residuals. The scatter plot of normal probability of residuals also indicates that the residuals are relatively normal. The diagram of the comparison between the turnover of the standard residuals and the regression standardized predicted value also indicate that the variance of residual is constant.

Considering the table Analysis of variance, whereas the probability value is less than 0.05, therefore, with confidence of 95%, it may be said that the model is significant. The coefficient of determination also shows that 14% of the variations of investment variable are explained by regression variables. Also, the coefficients of accounting quality (AQ) variables, cash flow operations (CFO),

1.
$$VIF_j = \frac{1}{1 - R_j^2}$$

cash flow operations in accounting quality (CFO * AQ), leverage, size, and the return on equity (ROE) are significant. In this model, only the tangibility variable is not significant; in other words, with a confidence of 95%, it may be said that the value of this variable has no influence on investment.

By analyzing the variance inflation factor, it is seen that all its values (which is between 1.217 and 2.705) indicate lack of collinearity among the independent variables. The static value of Durbin-Watson (1.78) shows lack of correlation among residuals. The diagram of normal probability plot also indicates that the residuals are normal. The diagram of the comparison between the turnover of the standard residuals and the predicted standard values also approves the assumption that the variance of residuals is constant.

3.8. Capital Rising in Investment Model

Considering the table of variance analysis, because the probability value is less than 0.05, therefore, with confidence of 95%, it may be said that the model is significant. The model determination coefficient also shows that 67% of the variations of investment variable are explained by regression variables. Also, the coefficients of accounting quality (AQ) variables, cash flow operations (CFO), tangibility, and the return on equity (ROE) are significant. In this model, only the tangibility variable is not significant. In other words, with confidence of 95%, it may be said that the value of these factors have an effect on investment.

3.9. Endogenous Switching Regression Model

Endogenous switching regressions model is used to address issues of self selection and the estimation of treatment effects when there is nonrandom allocation of subjects to treatment and control groups as is generally the case with observational (as opposed to experimental) data.

$$Y1 = X1_1 + u1 \text{ if } Z = 1$$

and

$$Y0 = X0_0 + u0 \text{ if } Z = 0$$

If we observe Y1 when Z = 1, in which case Y0 is unobserved, latent, or missing. Similarly, we observe Y0 when Z = 0, in which case Y1 is missing. Note that in practice, we observe sample respondents in only one state Z = 1 or Z = 0. In the experimental literature, there is the notion that those assigned to status 1 are identical to those assigned to status 0, so that there is interchangeability across statuses. It then makes sense to ask what the outcome would be if a respondent in status 1 were assigned to status 0 and vice versa.

Here, this model is used for controlling the selection about the procedure of companies' financing that is through bank credits or capital rising. The results obtained from this model have been presented in the tables.

Table 2: Estimation parameter

Factors	Companies with capital rising		Companies with bank credit	
	p-value	Coefficient	p-value	Coefficient
Intercept	0.201	0.46	0.075	-0.036
AQ	0.011	-0.32	0.011	-0.13
CFO	0.000	0.96	0.009	0.32
CFO * AQ	0.168	-0.65	0.000	-0.95
Leverage	0.185	0.16	0.001	0.29
Size	0.286	-0.07	0.013	0.08
Tangibility	0.001	-0.70	0.601	0.02
ROE	0.032	0.36	0.010	-0.17

The above table illustrates the coefficient and probability value of any of them in two groups of companies with bank credit and the companies with capital rising. Here, also in group of the companies with bank credit, the variables of accounting quality (AQ) variables, cash flow operations in

accounting quality (CFO * AQ), leverage, size, and the return on equity (ROE) are significant; and in the group of companies with capital rising also the variables of accounting quality (AQ), cash flow operations (CFO), tangibility, and return on equity (ROE) are significant.

Table 3: Endogenous switching regression

Variables	P-Value(Pr > Chi-Sq)	Test
AQ 1 = AQ	0.015	Test 1
CFO 1 = CFO 2	0.03	Test 2
ROE 1 = ROE 2	0.04	Test 3

According to the above table, by comparison significant coefficients between two groups of companies it can be concluded that there is a significant difference between ROE and CFO.

3.10. Bank Model

Considering the type of dependent variable, Probit Model is used for regression:

Table 4: Chi-Square Test results

Factor	P-value	d.f	Chi-Square
Pierson goodness of fit	1.000	352	23.3960

The Pearson Goodness-of-Fit Test whether this model is fitted to the data well. Meanwhile, the null hypothesis is the good fitness of the model in this test, therefore, since the probability value is more than 0.05, thus, it may be said that the model has been fitted to the data well.

Table 5: Parameter estimation

Variable	AQ	CFO	LEVERAGE	SIZE	TANGIBILITY	ROE	DivPos	Intercept
Coefficient	-0.389	0.243	-2.779	0,751	0.462	-0.764	0.345	-2.473
P-Value	0.219	0.770	0.000	0.011	0.362	0.123	0.179	0.170

To examine hypotheses, 2 and 3 we use Box-Cox Model because Box and Cox (1964) presented a computational method for determining a Box–Cox power transformation for the dependent variable where the objective is to Method obtain a simple, normal, linear model that satisfies the usual least squares assumptions. The Box–Cox criterion combines the objectives of the previous sections-simple relationship and homogeneous variance-with the objective of improving normality.

Table 6: Parameter estimation

Factors	P-value	T-value	Std. Error	coefficient
Intercept	0.000	234.69	0.008	1.805
AQ	0.000	4.690	0.021	0.096

$$\text{Bank Debt}_{\text{trans}} = 1.805 + 0.096 \text{ AQ}$$

As can be seen from table 6, the probability value is less than 0.05, therefore, null hypothesis is rejected and with a confidence of 95%, there is a significant relationship between accounting quality and bank credits and also due to positive coefficient regression of variable can be claimed that with improving accounting quality, amount of bank credits would rise.

4. Conclusion

We examine a sample of Iranian firms that have recently raised debt financing and investigate the role of private information and monitoring on the sensitivity of investment to internal cash flows. The result of endogenous switching regression in among companies which had been funded by capital rising and bank debt indicates that there is no significant difference between endogenous switching and OLS. Therefore, as result of negative coefficient CFO*AQ can be said that by improving accounting quality; the influence of asymmetry information on cash flow investment sensitivity is reduced. We find that improved accounting quality decreases investment-cash flow sensitivities for firms that investment through capital rising or bank debt. Moreover, we find that investment restrictions eliminate the influence of accounting quality on the investment-cash flow sensitivity. In addition, firms with high financial constraints, lenders' private information also mitigates the role of accounting quality in reducing the investment-cash flow sensitivity.

Furthermore, there is a significant and positive relationship between CFO and investment in both companies which had bank credits and capital rising and therefore it can be claimed that investment restrictions exert an influence over investment decision.

This is taken from the bank model, leverage has an inverse relationship with bank credits, and this means that companies which have higher leverage, having less chance for financing by bank credit, however, this is a reverse pattern for size of the companies. Then the impact of accounting quality and capital rising was investigated without control variables. According to statistical result, there is positive link between accounting quality and bank debt. It means by improving accounting quality companies are likely financing through bank credit, while this relation will be negative due to increasing leverage and the companies that their sizes are large have more tendencies to finance through bank credits. Furthermore, the companies which provide their finance through capital rising will be faced more with financial restriction, if the tangibility increase, while the financial restrictions will be reduced due to increase of ROE. Finally, the accounting quality has an effect on the amount of the companies' credits and this is another evidence for proving this claim that the accounting quality causes the reduction of sensitivities of cash flow investment; in more general sense, it is one of the positive methods for reducing financial restrictions, but this claim is not true about the companies that provide their finance through capital rising.

References

- [1] Almeida, H., and M. Campello, 2007. Financial constrains, asset tangibility, and corporate investment. *Review of Financial studies* 20: 1429-1460.
- [2] Almeida, H., M. Campello, M. Weibach, 2004. The Cash Flow Sensitivity of Cash, *the Journal of Finance*. Vol. LIX: 1777-1804.
- [3] Beatty, A., S Liao, and J Weber, 2009. The Effect of Private Information and Monitoring on the Role of Accounting Quality in Investment Decisions. <http://ssrn.com/abstract=1499307>.
- [4] Bharath, S. T., J. Sunder, and S. V. Sunder, 2008. Accounting quality and debt contracting. *The Accounting Review* 83: 1-28.
- [5] Biddle, G., and G Hillary, 2006. Accounting quality and firm-level capital investment. *The Accounting Review* 83: 1-28.
- [6] Biddle, G., G. Hilary, and R. Verdi, 2009. How does financial reporting quality related to investment efficiency? Working paper, MIT.
- [7] Board Statement of Financial Accounting Concepts(1978). No. 1.
- [8] Denis D .j., V, T Mihov, 2002. The choice among Bank debt, Non-Bank Private Debt and Public debt: Evidence from New Corporate Borrowing, *journal of Financial Economics*70:3-28.
- [9] Diamond, D, 1991. The choice between Bank loans and Directly Placed Debt. *The Journal of Political Economy* 99:689-721.

- [10] Fazzari, R., G. Hubbard, B. Peterson, 1987. Financing Constrains and Corporate Investment. *From Booking Papers on Economic Activity*, 1:141-195.
- [11] Francis, J., R. LaFond, P. Olsson, and K. Schipper 2005 the Market Pricing of Accruals Quality. *Journal of Accounting and Economics* 39, 295-327.
- [12] Hovakemian, A., G. Hovakemian, 2009. Cash Flow Sensitivity of Investment, *European Financial Management* 15:47-65.
- [13] Mashayekhi, B., S. Mehrani, K. Mehrani, G. Karami, 2005. Cash fund resulted from the operations and profit management in listed companies in Tehran Stock Exchange, *Periodical of Accounting & Auditing*. 44.
- [14] Musavishiry M, 1999. The survey effect reports of auditing on quality of financial reporting in Iran. Modarres Modarres University, Iran.
- [15] Talebian M, 2008. Quality of financial reporting, informational risk, capital cost. MA thesis. Islamic Azad University, Iran.
- [16] Verdi, R. 2006. Financial reporting quality and investment efficiency. Working paper, MIT
- [17] Whited, T. M., and G. Wu, 2004. Financial constraints risk. Working paper, University of Wisconsin.