A Study of Impact of Accounting Quality on Cash Flow Investment Sensitivity

Mohammad Reza Shoorvarzy, Mahmoud Mousavi Shiri and Abolfazl Kholousi

INTRODUCTION

Prior studies suggest that higher quality financial reporting increases investment efficiency. 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 [1]. Anne Beatty et al 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 [2]. Fazzari argued that investment is more sensitive to cash flow for the group of firms that our model implies is most likely to face external finance constraints [3]. Almeida’s and Campello’s model described a robust, precise relation-ship between investment-cash flow sensitivities and financial constraints. We show that if financial constraints primarily affect credit quantity constraints on firms, the investment-cash flow sensitivities are indeed useful measures of financial constraints [4].

Growing body of evidence also indicate that better accounting quality can reduce costs and financing constraints. Talebian found evidence 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 [5]. 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. 

Key words: Accounting Quality · Investment · Discretionary Accrual · Tehran Stock Exchange · Financial Restrictions

Abstract: This study investigates the effect of accounting quality on cash flow investment in the companies accepted in Tehran Stock Exchange during 2003-2008. Therefore, the assumptions have been analyzed through the investment model obtained from the total capital expenditure of companies as the investment and accounting quality which is resulted from the discretionary accrual of Jones's model. Furthermore, the company’s operation on the amount of investments has been studied through the controlling variables such as the size, tangibility, leverage and ROE. The statistical results obtained by endogenous switching method and ordinary least square in the research indicate that there is a negative and significant relation between the accounting quality and the investment cash-flow sensitivity, in other words, the investment cash-flow sensitivity is decreased due to the improvement of accounting quality, thus the financial restrictions are also reduced. We further find that investment restrictions eliminate the influence of accounting quality on the investment-cash flow sensitivity. Then, we find that companies have investment restrictions exert an influence over the investment decision.
We extend this research 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's model 1995 and then by investment model the effect of accounting quality on cash flow investment sensitivity is 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. we also find that the companies are facing with financial constrains, since they are sensitive to cash flow investment and it is consistent with Fazzari et al concluded that investment is more sensitive to cash flow for the group of firms that most likely to face external finance constraints [3].

**Literature Review:** Recent researchers have identified effective factors on cash flow investment sensitivity. Beginning with “Financing Constrain and Corporate Investment” by Fazzari et al. (1987). According to the findings of greater investment-cash flow sensitivity for the firms more likely to be constrained is typically interpreted as evidence of a large wedge between the internal and external cost of funds [3]. Almeid argued that the sensitivity is higher for firms with high growth rates and low dividend payout ratios [6]. Beatty et al. also argued that access to private information and direct restrictions on investments are likely to affect the extent to which accounting quality reduces financing constraints. They result to suggest that for financially constrained firms, banks’ access to private information decreases the value of accounting quality [2].

Almeida et al. 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 [6]. Biddle and Hillary concluded that 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 [7]. What is more; different sources of financing affect the importance of accounting quality on firms’ investment-cash flow sensitivity: Firstly, investment cash flow sensitivity is associated with both under investment when cash flows are low and over investment when cash flows are high. Secondly, 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 [8].

Francis et al concluded that 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 accrual's 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 [9]. In addition, Accrual's quality, are negatively associated with both firm underinvestment and over investment. 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 [10].

Furthermore, in 2005 Mashayekhi et al. studied the optional undertaking items into cash fund gained from operations of Tehran Stock Market; the results of their researches indicated that there was a negative and significant relation between these two variables [11].

**Data and Methodology:** This study is inductive and it makes use of past information and historical financial statements. This study is also a correlative study 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 assumption of the research is 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 companies in admitted in Tehran Stock Exchange and our sample includes 87 companies which were operating in the primary market during 2003-08 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.

- The entities should be listed before 2002.
- Date financial firms should lead to the end of March each year.
- The entities should be activated during 2003 to 2008.
- The entities should not change their financial periods.
- The entities’ availability of information is required.

**Assumption:** According to the research, the hypothesis arises:

**H:** Increasing the Accounting Quality reduces the Sensitivity of Cash Flow Investment.

**Investment Model:** We test our hypothesis about the effects of accounting quality and banks’ private information on the investment-cash flow sensitivity by estimating the following investment model:

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

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, 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 predict there is a negative and direct relation between **AQ** and **Investment**. Due to negative coefficient of **AQ**, increasing **AQ** decreases **Investment**, therefore, it can be claimed that by improving accounting quality, cash flow investment sensitivity is declined. We also 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.

**Variable Definitions**

**Investment:** The firm’s total capital expenditures divided by total average assets

**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× accounts receivable + 0.547× inventory + 0.535×PPE + cash divided by total assets [12].
Discretionary Accrual: Discretionary accrual is obtained by difference in total accrual and non-discretionary accrual. Therefore, we use variance inflation factor, 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 five shows lack of collinearity among independent variables and because all the values of the variance inflation factors were obtained near 1, accordingly, there was not collinearity among the independent variables. Considering the table for estimating the regression coefficients, regression model is obtained as follows:

\[
TA_t = \left[ \frac{1}{A_{it-1}} \right] + 0.001 \left( \frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} \right) - 0.444 \left( \frac{\Delta PPE_{it}}{A_{it-1}} \right)
\]

\[
DNA_t = TA_t = \left[ \frac{1}{A_{it-1}} \right] + 0.001 \left( \frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} \right) - 0.444 \left( \frac{\Delta PPE_{it}}{A_{it-1}} \right)
\]

Calculating Accounting Quality based on Discretionary Accrual: The accounting quality on the basis of discretionary accrual is the residual of the regression of Intercept 0.201 0.46 0.075 -0.036 Discretionary Accrual on cash flow operation which is calculated based on the following model:

\[
c_{it} = DNA_{it} - (\alpha_0 + \alpha_1 CFO_{it-1} + \alpha_2 CFO_{it} + \alpha_3 CFO_{it+1})
\]

By calculating Variance inflation factor all of results are close to 1, therefore, there is no linearity between independent variables.

\[
e_{it} = DNA_{it} - (0.040 - 0.014 CFO_{it-1} + 0.180 CFO_{it} - 0.159 CFO_{it+1})
\]

As a result, accounting quality of the companies can be obtained as follow:

\[
e_{it} = DNA_{it} - (0.040 - 0.014 CFO_{it-1} + 0.180 CFO_{it} - 0.159 CFO_{it+1})
\]

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

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.
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.

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.

**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) variable, cash flow operations (CFO), 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.

**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. Furthermore, 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 has effect on investment.

**Findings:** Focusing first on the OLS result, we find that CFO is positively correlated with investment for firms with bank debt and capital raising, suggestions that financial constrains affect investment decision for both sets of firms. We also find the effect is mitigated by the quality of firms’ financial accounting information. This consisted largely of Verdi’s argument that financial accounting information can reduce the information asymmetry between the firm and investors and thus lowers the firm’s cost of raising fund [11].

The endogenous switching tests yield results that are very similar to the OLS models. Therefore, we find that CFO is associated with investment and that good accounting quality reduces this association. Furthermore, as a result of the negative coefficients CFO*AQ can be said that by improving accounting quality; the influence of asymmetry information on cash flow investment sensitivity is reduced. As a result of the negative coefficients of Leverage and Size, the companies have more tendencies to finance through bank credit and ROE. Meanwhile, due to a positive coefficient of ROE, the companies which invested through capital rising they will invest more; however, if the tangibility rise, the companies have fewer tendencies to finance through capital rising.

**CONCLUSION**

We examine a sample of Iranian firms that had raised debt financing and capital rising. Then, we investigated 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
indicate that there is no significant difference between endogenous switching and OLS. Therefore, we also find that improved accounting quality decreases investment-cash flow sensitivities for firms that investment through capital rising or bank debt. Furthermore, investment restrictions exert an influence over investment decision.

Following the research, we find that companies which provide their finance through capital rising will be faced more with financial restriction if the tangibility would increase; while the financial restrictions will be reduced due the increase of ROE.

Our test of the non-equivalence of the coefficient on the CFO*AQ variable across the two regimes in the endogenous switching model indicates that banks’ access to private information is important and do not reduce the effect of accounting quality on the investment-cash flow sensitivity for firms likely to have the most severe information problems, in other words, private information can play as complement. It is the opposite statement of Biddle and Hilary that were expressed; banks’ superior private information should serve as a substitute for accounting quality in determining the sensitivity of investment to internal cash flows. While this prediction is consistent with theoretical models such as Holthausen and Verrecchia 1998, recent empirical research suggests that rather than acting as substitutes, private information and public information may act as complements [14].

REFERENCES