COULD FINANCIAL REPORTING QUALITY IMPROVE THE CAPITAL INVESTMENT EFFICIENCY OF CHINESE LISTED COMPANIES?

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ABSTRACT. *Based on information asymmetry models, this study formulates hypotheses to investigate whether higher FRQ can improve investment efficiency through lowering over-investment, reducing under-investment, or both in China. In addition, given the CSRC's continuous efforts spent on re-structuring and improving corporate governance in Chinese listed companies, we are also interested in examining whether an improved corporate governance system influences the effect of FRQ on investment efficiency in China. Our results reveal that FRQ alone does not improve investment efficiency through reducing over- and/or under-investment in China. However, FRQ does improve investment efficiency in the companies which have better corporate governance.*
Keywords: Financial reporting quality, Investment efficiency, Under- and over-investment, Corporate governance, China

1. **Introduction.** A large body of literature suggests that firms can reduce information asymmetries by enhancing financial reporting quality (or FRQ) (e.g., Bushman and Smith [1]; Houcine [2]). In line with this argument, Biddle and Hilary [3] propose that reducing the market imperfections of adverse selection and moral hazard and allowing managers to identify better investment opportunities, higher financial reporting quality increases investment efficiency. Furthermore, Chen et al. [4] document FRQ positively affects investment efficiency in the private firms across 21 developing countries. However, the institutional features of these studies mainly attribute to either the developed capital markets such as US and UK or Anglo-Saxon countries, it may obviate or alter the effects of FRQ from other institutional settings.

In China, the properties and importance of FRQ have been documented in the literature (e.g., Chen and Zhang [5]; Habib and Jiang [7]). Moreover, fuelled by a series of high-profile corporate scandals for violating provisions of financial reporting, the China Securities Regulatory Commission (or the CSRC) published several policies with the quality of financial reporting laid at heart. We hypothesise that higher-quality financial reporting is associated with either lower over-investment, lower under-investment, or both in Chinese listed companies.

Furthermore, good corporate governance could also be associated with investment efficiency, since corporate governance plays an active and important role in protecting investors welfare through mitigating managerial opportunistic behaviors. In China, the

CSRC continuously and actively promoted corporate governance improvement in listed companies, and achieved positive results to a certain extent (Chen and Zhang [5]). Based on this reasoning, we are also interested in explicitly investigating the impact of corporate governance system on investment efficiency and the effect of FRQ.

Built upon 7,728 firm year observations over the period of 2003 to 2016, we find that higher FRQ alone in Chinese listed companies may not improve investment efficiency through mitigating over- and/or under-investment behaviours. However, when we include the proxy of corporate governance in our models, its effect and the joint effect with FRQ have negative and statistically significant correlations with over- as well as under-investment behaviors. In sum, our findings provide consistent results suggesting that better corporate governance enhance financial reporting on firm's investment efficiency. In specific, better corporate governances promote high quality of financial reporting which in turn mitigates managerial opportunism on over-investment practices.

2. Literature Review and Institutional Setting.

2.1. Financial reporting quality (FRQ) and investment efficiency.
As an important channel of acquiring company's specific information, financial accounting information may potentially serve to mitigate the deviations from the optimal investment police (Chen et al. [6]; Habib et al. [8]). Specifically, theory suggests that improved financial transparency has the potential to alleviate both moral hazard and adverse selection problems (e.g., Lambert et al. [9]; Habib et al. [10]). High-quality of financial reporting operates to mitigate the problem of adverse selection through reducing investors' liquidity risk and improving accuracy in identifying good investments. In particular, timely disclosure of high-quality financial accounting information reduces investors' risk of loss from trading with more privately informed investors, thereby attracting more funds into the capital markets, lowering investors' liquidity risk (Liu et al. [11]). Leuz and Wysocki [12] further argue that more disclosure reduce the uncertainty about firm value, which in turn reduces the extent to which uninformed investors need to price protect and hence increase market liquidity. In addition, while financial accounting information enables managers and investors to identify value creation opportunities with less error, it can also enlarge the investor base for firms, which in turn improves risk sharing and lowers cost of capital. Cheng et al. [13] develop a model of dynamic adverse selection and empirically show that firms with better financial reporting have more flexibility to issue capital with lower cost and are less likely to obtain excess funds due to temporary mispricing.

2.2. Chinese capital market.
At the beginning of the 1990s, the Chinese stock market was established by the government with the primary purpose of helping the state-owned enterprises (SOEs) to raise capital and improve operating performance (Chen and Zhang [5]). For historical reasons, the majority of Chinese listed companies originate from restructured SOEs. In order to help these former SOEs relax external financing constraints, regulations introduced have been asymmetrically in favour of them and/or the companies have close relationship with the government. In exchange, the state keeps enough equity interest to control all former SOEs. In short, the ownership structure of Chinese listed companies is characterized by shares being held by one or few shareholders who in most cases are controlled by the state. As stated by Chen and Zhang [5], the highly concentrated ownership is an important feature of corporate governance in Chinese listed companies.

Such a phenomenon sheds lights on many dilemma observed in China's stock market. One promising issue mainly attributes to controlling shareholders' expropriation of controlling shareholders at the expense of outside minority investors (Yang et al. [14]). The Chinese regulatory framework that is characterized by poor property right protection and incomplete infrastructure may not be able to offer high-level of protection on investor

rights. Indeed the conflicts of interest are even more severe in state-dominant firms, since the state is playing the conflicting dual roles at the same time – the owner of SOEs and regulator/administrator (Firth et al. [15]). Thus, in China's capital markets, the controlling shareholder may be more likely to pursue self-serving investment strategies.

In addition, the state wants the firms they controlled to be run efficiently, but not solely for the purpose of wealth maximization. These firms are also burdened with other purposes from the perspective of social and political concerns. Other immediate purposes normally include the maintenance of urban employment level, fiscal health, direct control of the key industries such as banking, telecommunication and natural resource, political-based job arrangement (Chen et al. [6]). Influenced by those 'non-profit' driven purposes, state-owned listed companies in China are likely to miss profitable investment opportunities to carry out policies of the government. In order words, the investment decision markings in China may be originated from political concerns rather than pure economic perspective (Jiang and Kim [16]; Sikka and Stittle [17]).

3. **Hypothesis Development.** Much of the literature has yielded empirical findings that relate FRQ to investment efficiency; however, those studies tend to focus on the Western experiences. By employing both cross-country (US vs. Japan) and within-country (US only) tests, many research results show that higher-quality accounting reduces investment-cash flow sensitivity, and thus increases investment efficiency at the firm level. Also, some studies report a stronger relation between accounting quality and capital investment efficiency in countries with predominant equity financing of firm-level capital investment.

The institutional setting in China which is very different from that in the Western countries explains that, other than the original agency problem, Chinese listed companies also suffer the problem of expropriation of controlling shareholder at the cost of minority shareholders; and such a problem is even worse in the state-controlled firms. Given the weak protection on investor rights, the controlling shareholders with private information are more likely to expropriate minority shareholders through over-investment. We hypothesize that higher-quality financial reporting is positively associated with investment efficiency. So our first hypothesis is as follows.

Hypothesis 1. *Firms with higher FRQ will show higher investment efficiency.*
Hypothesis 1a. *Firms with higher FRQ will mitigate over-investment problem.*
Hypothesis 1b. *Firms with higher FRQ will mitigate under-investment problem.*

Other than improving FRQ, the CSRC also formulated policies and regulations to reform corporate governance in China at the beginning of the 2000s with the aim of enhancing shareholders' protection against expropriation by both managers and controlling shareholders. Chen and Zhang [5] empirically find that the 2002 corporate governance Code had a positive effect on curbing earnings management practices in Chinese listed companies. Other studies report that governance mechanisms could also be associated with investment efficiency. As well as checking the isolated effect of FRQ and corporate governance on investment efficiency, we also examine their interaction effect, i.e., we investigate whether the effect of FRQ on investment efficiency is increasing with the level of corporate governance in China. Therefore, our second hypothesis and its sub-hypotheses are as follows.

Hypothesis 2. *The relation between FRQ and investment efficiency is stronger for those firms with better corporate governance.*
Hypothesis 2a. *In an over-investment scenario, the relation between FRQ and investment efficiency is stronger for those firms with better corporate governance.*
Hypothesis 2b. *In an under-investment scenario, the relation between FRQ and investment efficiency is stronger for those firms with better corporate governance.*

4. Methodology.

4.1. Variable design and measurement.

4.1.1. *Dependent variable – investment efficiency.* We adopt the model developed by Richardson [19] to measure the practices of over- and under-investment behaviors in Chinese listed companies (or $InvEff_{i,t}$). Specifically, we define total investment for firm i in year t, $I_{TOTAL,i,t}$, as the sum of all outlays on capital expenditure, acquisitions and research and development less receipts from the sale of property, plant and equipment.

Furthermore, as proposed by Richardson [19], total investment expenditure of firm i in year t (or $I_{TOTAL,i,t}$) has two main components, namely the required investment expenditure to maintain assets in place (or $I_{MAINTENANCE,i,t}$), and investment expenditure on new projects (or $I_{NEW,i,t}$). $I_{MAINTENANCE,i,t}$ is measured by the value of amortization and depreciation of firm i in firm t. It is an estimate of the portion of total investment expenditure that is necessary to maintain plant, equipment and other operation assets. Thus, I_{NEW} can be obtained by subtracting $I_{MAINTENANCE,i,t}$ from $I_{TOTAL,i,t}$. The next step is to decompose $I_{NEW,i,t}$ into expected investment expenditure in new positive NPV projects, and abnormal (or unexpected) investment (or $I\varepsilon_{NEW,i,t}$). Specifically, $I\varepsilon_{NEW,i,t}$ is measured as the unexplained portion (or residual) of the following regression model which regresses firm's specific characteristics against the total investment on new projects (or $I_{NEW,i,t}$). While the negative values of the residual correspond to under-investment behaviours, the positive $I\varepsilon_{NEW,i,t}$ reflects the magnitude of over-investment practices.

$$
\begin{aligned}
I_{NEW,i,t} = \alpha &+ \beta_1 B/M_{i,t-1} + \beta_2 LEVERAGE_{i,t-1} + \beta_3 CASHLEVEL_{i,t-1} \\
&+ \beta_4 AGE_{i,t-1} + \beta_5 SIZE_{i,t-1} + \beta_6 STOCKRETURNS_{i,t-1} + \beta_7 I_{NEW,i,t-1}
\end{aligned}
\tag{1}
$$

where $I_{NEW,i,t}$ = the difference between total investment expenditure and required investment expenditure to maintain assets in place of firm i in year t; $B/M_{i,t-1}$ = ratio of book value to market value of equity of firm i in year $t-1$; $LEVERAGE_{i,t-1}$ = the sum of the book value of short term and long term debt deflated by the sum of the book value of total debt and the book value of equity of firm i in year $t-1$; $CASHLEVEL_{i,t-1}$ = the sum of cash and short term investment deflated by the book value of total assets of firm i in year $t-1$; $AGE_{i,t-1}$ = the natural logarithm of the number of years the firm i has been listed on either the SZSE or SHSE as of the start of the year; $SIZE_{i,t-1}$ = the natural logarithm of the book value of total assets of firm i at the end of year $t-1$; $STOCKRETURNS_{i,t-1}$ = the change in market value of firm i over that prior year deflated by the book value of total assets in year $t-1$.

All investment expenditure variables are scaled by average total assets.

4.1.2. *Independent variable – FRQ.* There is no universally accepted measure of FRQ. We use three measures that have been used in prior research for FRQ. Our first proxy is based on the cross-sectional Dechow and Dichev model, as modified by Francis et al. (Dechow et al. [20]). The model is based on the notion that accruals are estimates of future cash flows, and earnings will be more predictive of future cash flows when there is lower estimation error embedded in the accruals process. State differently, it focuses on the estimation error of accruals; the lower this error is, the higher the FRQ can be obtained. Specifically, we estimate the following model for each industry that has at least 16 observations:

$$
TCA_{i,t} = \alpha_0 + \alpha_1 OCF_{i,t-1} + \alpha_2 OCF_{i,t} + \alpha_3 OCF_{i,t+1} + \alpha_4 \Delta Rev_{i,t} + \alpha_5 PPE_{i,t} + \varepsilon_{i,t} \tag{2}
$$

where $TCA_{i,t}$ = working capital accruals, measured as the change in non-cash current assets minus the change in current non-interest-bearing liabilities, scaled by lagged total assets; OCF = cash flow from operations in lagged $(t-1)$, current (t), and future $(t+1)$ period respectively, scaled by lagged total assets; $\Delta Rev_{i,t}$ = the annual change in revenues

scaled by lagged total assets; $PPE_{i,t}$ = property, plant, and equipment, scaled by lagged total assets.

The residuals from Equation (3) represent the estimation errors in the current accruals that are not associated with operating cash flows and that cannot be reflected by the change in revenue and the level of PPE. In our tests, we follow Chen et al. [6] and use the absolute value of the residuals as a proxy for FRQ. We multiply the absolute values of the Dechow-Dechev (or $DD_{i,t}$) measure by negative one. Thus, higher values of $DD_{i,t}$ represent higher FRQ.

The second proxy for FRQ is performance-adjusted discretionary accruals as developed by Kothari et al. [21]. The accrual component of earnings contains accounting estimates based on forecasts and is therefore easier to manipulate, which in turn higher level FRQ should be characterized by lower magnitude of discretionary accruals (Dechow et al. [20]). In particular, we estimate the following model for each industry that has at least 16 observations:

$$TA_{i,t} = \alpha_0 + \alpha_1(1/Asset_{i,t-1}) + \alpha_2\Delta Rev_{i,t} + \alpha_3 PPE_{i,t} + \alpha_4 ROA_{i,t} + \varepsilon_{i,t} \qquad (3)$$

where $TA_{i,t}$ = total accruals, scaled by lagged total assets; $\Delta Rev_{i,t}$ = the annual change in revenues scaled by lagged total assets; $PPE_{i,t}$ = property, plant, and equipment, scaled by lagged total assets; $ROA_{i,t}$ = return on assets for firm i at year t.

The residuals from the regression model are discretionary accruals; and we use their absolute value to represent the magnitude of discretionary accruals. We multiply the absolute values by -1 (or $DAs_{i,t}$). Thus, higher values of $DAs_{i,t}$ demonstrate higher FRQ.

As proposed in prior literature, the expected investment expenditure on new projects will be an increasing function of growth opportunities. The underlying construct of growth opportunities refers to the present value of the firm's options to make future investments (Richardson [19]). Thus, in order to capture the effect of growth opportunities on investment decisions, we include the book-to-market of equity (or $B/M_{i,t-1}$) to measure the growth opportunities. Moreover, we also use the change stock returns (or $STOCKRETURNS_{i,t-1}$) as an additional variable to capture growth opportunities which are not reflected in B/M ratio. In addition, we include other explanatory variables that have been shown to be the determinants of investment decisions, including leverage, the level of cash, firm age, and firm size. To ease exposition, we multiply the under-investment variable (negative values of the residual) by -1 so that a higher value suggests a more severe under-investment.

4.1.3. *Corporate governance variables.* With regard to corporate governance measurement, we construct an index of corporate governance using principal component analysis (PCA) technique and examine its overall impact on investment efficiency in China. In particular, we include the following individual variables in our index (denoted as $CG\_INDEX_{i,t}$). By putting all together, we use the all individual variables (see Table 1) to construct our corporate governance index that aims to capture the overall structure of corporate governance system in China and its impact on FRQ and investment efficiency.

4.1.4. *Control variables.* Following the prior literature, we introduce controls for effects that could confound our findings. First of all, we control for cash flow ($\sigma(CFO)_{i,t}$) and sales ($\sigma(SALES)_{i,t}$) volatilities measured by standard deviation of the cash flow from operations deflated by average total assets and the sales deflated by average total assets from years $t-5$ to $t-1$ respectively. Second, we control for firm size (or $FIRM_{i,t-1}$) measured by the natural logarithm of total assets at the end of year $t-1$, financial leverage (or $LEVERAGE_{i,t}$) measured by the sum of the book value of short term and long term debt deflated by the book value of total asset in year t, level of profitability (or $ROA_{i,t}$)

TABLE 1. Variables used in corporate governance index calculation

Ownership Characteristics	
$TOP1_{i,t}$	is the percentage shareholding by the biggest shareholder in firm i year t.
$TOP2\_10_{i,t}$	is the Herfindahl index, the sum of the squared faction of shareholding by each of the top ten investors, excluding the largest shareholder in firm i year t.
$PRIVATE_{i,t}$	is a dummy variable that equals 1 if firm i is privately controlled in year t and 0 if it is state-owned.
Board Characteristics	
$INBOARD_{i,t}$	is the ratio of number of independent directors on the board in firm i year t.
$DUAL_{i,t}$	equals 1 if the CEO is the chairman or a vice-chairman of the board and 0 otherwise in firm i year t.
External Monitoring Mechanisms	
$AUDITOR_{i,t}$	takes the value of 1 if firm i is audited by one of the Big 4 auditors in year t, and 0 otherwise.
$HBSHARE_{i,t}$	is a dummy variable that equals 1 if company i in year t issues H-shares or B-shares on the stock markets and 0 otherwise.

measured by net profit divided by total asset in year t, and growth rate (or $\%\Delta ASSET_{i,t}$) measured by the percentage change of total asset in year t from $t-1$.

4.2. **Regression model.** First, we test whether higher FRQ is negatively associated with investment when firms are likely to over-invest and/or under-invest. Specifically we estimate the following model.

$$InvEff_{i,t} = \beta_0 + \beta_1 FRQ_{i,t} + \Sigma\gamma_j Control\_Variables_{j,i,t} + \varepsilon_{i,t} \qquad (4)$$

We estimate Equation (4) using OLS. Regarding the issue of heteroskedasticity in the residuals of OLS, and we adjust the standard errors using a two-dimensional cluster at firm and year level. We also include industry fixed-effects using the CSRC 23-industry classification to control for industry specific shocks to investment. To the extent that FRQ mitigates over- and under-investment (H1a,b), β_1 is expected to be negative for both over- and under-investment variables.

Second, in Equation (5), we extend our Equation (4) by including the effect of corporate governance on the association between investment and FRQ.

$$\begin{aligned} InvEff_{i,t} = {} & \beta_0 + \beta_1 FRQ_{i,t} + \beta_2 CG\_INDEX_{i,t} + \beta_3 FRQ_{i,t} * CG\_INDEX_{i,t} \\ & + \Sigma\gamma_j Control\_Variables_{j,i,t} + \varepsilon_{i,t} \end{aligned} \qquad (5)$$

$FRQ * CG\_INDEX$ is the interaction term of FRQ and the index of corporate governance. After adding this interactive variable, the coefficient β_1 captures the relation between FRQ and investment efficiency for the omitted group. And coefficient β_3 measures the incremental relation between FRQ and investment as corporate governance index we created could capture more effects. The sum of the coefficients ($\beta_1 + \beta_3$) measures the relation between reporting quality and investment when our index could capture the most effects.

4.3. **Sample and data.** We use non-financial Chinese firms listed on the Shanghai and Shenzhen Stock Exchanges during 2003-2016. While firms' financial data are obtained from the China Centre for Economics Research (CCER) database, the corporate governance data are sourced from China Stock Market and Accounting Research (CSMAR) database. In order to calculate the proxies of FRQ, our sample firms are segregated into

13 industrial groups, based on the CSRC's industry classification – ranging from Agriculture, Forestry, & Fishing (A) to Miscellaneous products & services (M) (CSRC, 2001). In addition, we require each industrial group or sub-group to have at least eight observations per year. Moreover, we restrict our sample to non-financial firms. We also require the sample firms to have both financial data and corporate governance data for each year over the study period. Based on the above specifications, our sample consists of 966 sample firms from 2003-2016 representing 7,728 firm-year observations.

5. **Main Empirical Results.** Table 2 reports the regression results for the test of hypothesis series 1. In the first three columns, we find that although all measurements of FRQ are negatively correlated with the level of investing inefficiency in terms of both over- and under-investment, only the coefficient of DAs (-0.005) is statistically significant at 5 percent level. For the over-investment group, columns 4 to 6 report that the level of financial reporting is negatively associated with over-investment activities, but the relationships are not statistically significant. Regarding the under-investment group, our results show that the level of under-investment decreases with the quality of firm's financial reporting, since the coefficients are negative and significant for DD (-0.013) and DAs (-0.007) at 5 percent and 10 percent respectively. In contrast to the prior literature that focused on the Western experience, our results provide evidence suggesting that better financial reporting quality alone in Chinese listed companies may not effectively increase firm's investment efficiency through mitigating over- and under-investing practices. Of the control variables, most of our control variables are significantly correlated with the measurements of investment behaviors. This result shows that our hypothesis 1 is proved. In particular, we hypothesize that the reduction of information asymmetry and more reliable accounting numbers, due to higher FRQ, could add to better monitoring due to well-structured corporate governance system and, as a consequence, the effect of FRQ

TABLE 2. Regression results of investment behaviors and FRQ

Variables	Dependent Variable $InvEff$			Dependent Variable $Over\text{-}investment$			Dependent Variable $Under\text{-}investment$		
DD	−0.004 (−0.762)			−0.006 (−1.191)			−0.013* (−1.944)		
DAs		−0.005** (−3.014)			−0.004 (−1.317)			−0.007** (−2.442)	
$ORECTA$			−0.003 (−1.612)			−0.002 (−0.688)			0.001 (0.045)
$\sigma(CFO)$	0.028*** (7.423)	0.020* (1.986)	0.026*** (4.611)	0.030*** (7.829)	0.025*** (6.113)	0.025*** (6.558)	−0.058*** (−3.994)	−0.131*** (−8.155)	−0.522*** (−13.988)
$\sigma(SALES)$	0.081*** (10.254)	0.000 (0.927)	0.177*** (9.583)	−0.003 (−0.699)	−0.003 (−0.983)	−0.006* (−1.909)	0.068*** (5.082)	0.007 (0.482)	0.064*** (4.312)
$FIRM$	−0.013** (−3.013)	−0.008** (−2.196)	0.008 (1.581)	−0.020* (−2.290)	0.014*** (3.826)	−0.008** (−2.196)	−0.009 (−1.471)	−0.011 (−0.703)	−0.133*** (−8.542)
$LEVERAGE$	0.010** (2.764)	0.006 (1.404)	0.055*** (9.695)	0.017** (2.330)	−0.001 (−0.314)	0.012*** (3.196)	−0.012** (−2.080)	−0.022* (−1.648)	−0.072*** (−5.057)
ROA	0.000 (0.822)	0.014 (0.946)	−0.007 (−1.289)	0.003 (1.591)	−0.036*** (−10.195)	−0.053*** (−13.862)	−0.006 (−0.988)	−0.001 (−0.080)	−0.002 (−0.159)
$\%\Delta ASSET$	0.001 (0.273)	0.106*** (6.667)	0.023*** (4.296)	0.002 (1.443)	0.804*** (7.651)	0.804*** (5.508)	−0.003 (−0.588)	0.229*** (6.497)	0.086*** (5.908)
$Intercept$	0.107*** (7.744)	0.131*** (7.112)	0.106*** (10.667)	0.132*** (8.581)	0.124*** (9.048)	0.086*** (6.174)	−0.014 (−0.720)	0.005 (0.052)	1.298*** (11.788)
$Industry\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Firm/Year\ Cluster$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OBS	7,728	7,728	7,728	2,859	2,859	2,859	4,869	4,869	4,869
$Adjusted\ R^2$	0.108	0.081	0.079	0.051	0.062	0.078	0.073	0.156	0.069

*, **, *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

on investment efficiency should be higher for firms with higher FRQ and good corporate governance.

When we turn our attention to the corporate governance variables, the results are reported in Table 3. Consistent with the prior results, only few coefficients on FRQ measurements are statistically significant at 10 percent and 5 percent respectively. However, when we consider the effect of the corporate governance on investment behaviors, we find that all investment proxies are negatively correlated with CG_INDEX, and the estimated coefficients are statistically significant from 10 percent to 1 percent. More importantly, in terms of the interaction between the corporate governance proxy and FRQ, the estimated coefficients are negative and statistically significant from 10 percent to 1 percent across all models suggesting that the relations between investment behaviors and FRQ are dependent on the level of corporate governance. Our findings reveal that better corporate governance enhances financial reporting on firm's investment efficiency. In specific, better corporate governance promotes high quality of financial reporting which in turn mitigates managerial opportunism on over-investment practices. On the other hand, high quality of financial reporting guaranteed by good corporate governance effectively reduces the asymmetry of information between firms and investors, and thus reduces under-investment practices ex post. By taking all together, it is argued that coupled with the effect of corporate governance financial reporting can effectively improve investment behaviors in Chinese listed companies. Accordingly, our second sets of hypotheses are supported by our results.

TABLE 3. Regression results of investment behaviors, FRQ and corporate governance

Variables	Dependent Variable InvEff			Dependent Variable Over-investment			Dependent Variable Under-investment		
DD	0.001 (0.366)			−0.003 (−1.448)			0.011 (1.667)		
DAs		−0.015** (−2.455)			−0.010* (−1.717)			−0.007* (−1.887)	
ORECTA			−0.010* (−1.689)			−0.060* (−1.833)			0.001 (0.224)
CG_Index	−0.020*** (−6.591)	−0.068*** (−6.455)	−0.025*** (−5.428)	−0.058*** (−6.515)	−0.067*** (−5.066)	−0.017** (−2.881)	−0.019* (−1.887)	−0.065*** (−7.548)	−0.019** (−2.018)
DD*CG_Index	−0.073*** (−2.766)			−0.071*** (3.448)			−0.019 (1.577)		
DAs*CG_Index		−0.044** (−2.486)			−0.017* (−2.641)			−0.015* (−3.031)	
ORECTA *CG_Index			−0.209** (−2.322)			−0.192*** (−2.811)			−0.020** (−2.034)
Intercept	−0.034*** (−6.116)	−0.050*** (−7.081)	−0.068*** (−9.886)	−0.007 (−1.196)	−0.005 (−0.718)	−0.031*** (−4.218)	−0.024 (−1.244)	−0.083*** (−2.944)	−0.70*** (−2.793)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm/Year Cluster	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OBS	7,728	7,728	7,728	2,859	2,859	2,859	4,869	4,869	4,869
Adjusted R^2	0.042	0.157	0.124	0.093	0.093	0.154	0.072	0.135	0.036

*, **, *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

6. **Discussion and Conclusions.** Prior research suggests that firms can reduce information asymmetries by enhancing financial reporting quality (or FRQ). In specific, reducing market imperfections of adverse selection and moral hazard and allowing managers to identify better investment opportunities, higher financial reporting quality increases investment efficiency.

Differing from the prior literature, we study the role of accounting information on investment behaviors of Chinese listed companies. Our results show that although most

proxies of FRQ are negatively correlated with over- and/or under-investment, few coefficients are statistically significant. It reflects that higher financial reporting quality alone in Chinese listed companies may not effectively increase firm's investment efficiency as documented in the Western experiences. However, our findings further reveal that relations between investment behaviors and FRQ are dependent on the level of corporate governance.

For the future research, we recommended to find the more appropriate proxy to identify the FRQ and corporate governance. Especially for corporate governance, a lot of studies use internal control system quality, governance performance and so on to describe the level of corporate governance. Also, how to identify the under- or over-investment is different industries and time horizon. We would like to see more accurate study in various industries. Since this study only focuses on the financial information quality, the effect of non-financial information quality could be interesting research topic in the future.

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