

Do Opaque Firms Prefer Liquidity? An International Evidence*

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Using an international setting, this study investigates the relation between cash holdings and financial reporting quality, measured by accruals quality. Empirical results show that the balance of cash holdings is positively related to the opacity of financial reporting in non-U.S. international markets. The relation becomes stronger as the strength of investor protection increases, implying that precautionary motives, instead of agency motives, drive the increase of cash holdings of opaque firms. In addition, the positive relation is stronger for discretionary accruals quality. The decomposition of the aspects of investor protection shows that public enforcement through regulation authorities is the main driver of the positive relation between cash holdings and the opacity of financial reporting.

Keywords : *Cash Holdings, Accruals Quality, Investor Protection*

I. Introduction

Although substantial research has been conducted on the determinants of cash holdings, there are not many studies on how financial reporting influences cash holdings. Accounting literature has found that financial reporting significantly influences several aspects of financing, investing, and firm valuation. However, few papers have studied the relation between the quality of financial reporting and the level of cash holdings.

This study investigates how accruals quality

is associated with cash holdings in an international setting. Prior studies on this issue investigate the relation between these two factors using observations from a specific country, despite the fact that the level of cash holdings is affected by country level characteristics (García-Teruel et al., 2009; Sun et al., 2011; Dittmar et al., 2003; Kalcheva and Lins, 2007). This study focuses on how investor protection influences the relation between accounting quality and cash holdings by examining different legal institutional characteristics across nations.

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The quality of financial reporting is widely measured using accruals, as accruals reflect forward looking information and manager discretion on financial reporting. However, accruals are also influenced by operating characteristics and the private information of managers (Guay et al., 1996; Subramanyam, 1996; Kothari et al., 2005; Dechow and Dichev, 2002). Especially, when the volatility of operations is high, the predictions in estimating accruals are imprecise, inducing higher estimation errors. In the concept of accruals quality suggested by Dechow and Dichev (2002), these errors degrade accruals quality. Thus, the quality of accruals decreases with the operating volatility of the firm, even without opportunistic reporting decisions of managers.¹⁾ Therefore, this paper focuses on this to show that accruals quality should not necessarily be interpreted in the agency problem context.²⁾

In addition, as the volatility of operations is the main trigger for the precautionary motives of cash holdings, Prior studies argue that firms with a high level of operating volatility reserve large cash holdings for precautionary motives (Haushalter et al., 2007; Hoberg et al., 2014; Larkin, 2013). Therefore, accruals quality and cash holdings should be positively associated through operating volatility.³⁾

However, investors do not welcome large cash holdings because of potential agency problems (Jensen, 1986). Moreover, the ex-

pected returns on cash assets are the lowest among all types of assets, which is another reason why investors do not prefer large cash holdings. Therefore, in general, cash holdings would be suppressed at lower levels when investors can discipline managers. However, precautionary cash holdings enable the firm to secure potential investment opportunities with positive net present values (NPV), even when there is no access to external financing methods. Therefore precautionary motive-driven cash holdings are likely to be positively assessed by investors when the investors have the means to monitor and prevent the opportunistic behaviors of managers, such as expropriation through the use of cash holdings for private interests.

Using international financial data, this study tests these conjectures. The final sample is composed of 18,071 observations from 24 non-U.S. countries. The regression model suggested by Opler et al. (1999) is modified by including an accruals quality measure to examine the sensitivity of cash holdings to accounting quality. This study adopts the accruals quality measure of Dechow and Dichev (2002) as the proxy for financial reporting quality. In addition, several country-level investor protection measures are incorporated in the model to examine the influence of investor protection on the sensitivity of cash holdings to accounting quality. This study uses the origin of law (La Porta et al., 1998), the anti-self-dealing index (Djankov et al., 2008), and the strength of private/public enforcement as the proxies for the strength of investor protection.

The tests of this study find that the balance of cash holdings increases with the opacity of accruals, and that this relation becomes stronger with the strength of investor protection. Because investor protection mitigates agency problems, these results reject the argument that agency motives drive the positive association between cash holdings and the opacity of financial reporting. Subsequent analyses show that both innate and discretionary accruals quality are positively

1) Palepu et al. (2000) suggest that these estimation errors are a determinant of accruals quality. They also point out that the complexity of transactions and the predictability of firm operations affect the precision of accruals estimation. The low accuracy of accruals would reduce the predictive power of accruals and net income, which would in turn reduce the quality of accounting information.

2) Dechow and Dichev (2002) point out that both managerial misconduct and operating volatility could affect the quality of accruals and accounting information.

3) This does not imply that opacity drives large cash holdings. Cash holdings and accounting opacity is positively related by operating volatility.

associated to cash holdings, but the association of discretionary accruals quality increases with the strength of investor protection.

By distinguishing private and public enforcement of investor protection, we find that the strength of public regulators mainly intensifies the relation between cash holdings and the opacity of financial reporting. On the other hand, the strength of disclosure requirements has little impact on cash holdings of opaque firms. Public regulations have a significant influence on the sensitivity of cash holding to discretionary accruals quality, but this does not apply to innate accruals quality.

This study makes several contributions to the literature. First, this study clarifies the main driver of the positive relation between cash holdings and the opacity of financial reporting. Prior studies on this issue expect cash holdings to increase with accounting opacity (García-Teruel et al., 2009; Sun et al., 2011), arguing that the agency motives of cash holdings drives the association between cash holdings and opacity because the lack of monitoring allows the manager to pursue private benefits. However, this study postulates that precautionary motives can also be a viable explanation for these results as well. Using international data, this study refutes the conjecture based on agency motives and finds evidence that supports precautionary motives as the main driver for the findings in prior literature.

Second, researchers have studied the impact of the country-level institutional characteristics on financial issues. Among these studies, many find that the protection of property rights improves the overall activity of financial markets, implying that capital markets are developed under strong investor protection (La Porta et al., 1997; La Porta et al., 1998, 2000b). Investor protection has also been documented to improve financial reporting quality (Ball et al., 2000; Ball et al., 2003; Leuz et al., 2003; Bushman and Piotroski, 2006) and the efficiency of investments (Biddle and Hilary, 2006). Consequently, investor protection improves firm

valuations as well (Bhattacharya and Daouk, 2002; Bhattacharya et al., 2003; Hail and Leuz, 2006, 2009). My study expands the literature on investor protection by providing additional evidence that strong investor protection encourages more cash holdings for precautionary motives. The results are closely related to La Porta et al. (2000b) and Biddle and Hilary (2006), as the findings support their arguments with evidence that the motivation of financing activities is clearly reflected in the financing decisions of firms. As investor protection reduces the potential cost of agency problems and adverse selection, firms in strong investor protection regimes can reserve more precautionary cash holdings that are financed through market-centered financing, instead of bank-centered private financing. Hence, firms in strong investor protection regimes are less likely to lose investment opportunities with positive net present value (Almeida et al., 2004), even when facing large volatility, which would lead to the improvement of investment efficiency.

Lastly, this paper also provides implications regarding the management of financial slack in small and medium size enterprises (SMEs). Compared to large corporations, SMEs are more likely to be financially constrained, especially because SMEs have limited access to financial markets to raise capital. Therefore, SMEs are more likely to pass up positive net present value (NPV) projects, which leads to under investment. Thus cash holdings are more valuable in SMEs than in large corporations (Faulkender and Wang, 2006).

However, the operations of SMEs are generally uncertain and volatile, and as a consequence, opacity, measured by accruals quality, is higher for SMEs (Francis et al., 2005). Therefore, due to this opacity in SMEs, holding a large cash reserve is likely to destroy firm value by being consumed in unprofitable investments (Harford, 1999; Biddle et al., 2009).

The results of this study imply that large cash holdings of *precautionary motives* are

acceptable in countries with strong investor protection. Therefore, to allow SMEs utilize cash holdings to alleviate financial constraints, investor protection should be strengthened to mitigate potential agency problems potentially encouraged by cash holdings.

The remaining paper proceeds as follows: Section 2 reviews related literature and section 3 suggests the main hypotheses. Section 4 presents research empirical designs. In section 5 and 6 the results of main analyses and additional analyses are presented, respectively. Section 7 concludes the paper.

II. Related Literature

2.1 Cash holdings

Cash reserves provide the most convenient and monitoring-free source of financing. As Keynes (1936) suggested, firms need cash and cash equivalents to protect good investment opportunities regardless of their financial status (Almeida et al., 2004; Mikkelsen and Partch, 2003; Frésard, 2010), and/or to prepare for potential risks from unexpected capital needs (Harford et al., 2014; Acharya et al., 2012; Haushalter et al., 2007; Morellec et al., 2013). Thus, managers would prefer to have large cash reserves as financial slack. Keynes named the motive from these needs as the precautionary motive. Recent research papers on cash holdings argue and find evidence that precautionary motives are the strongest driver of increasing cash reserves (Bates et al., 2009; Harford et al., 2014).

However, holding cash is not free from costs (Opler et al., 1999; Kim et al., 1998). First, the profitability of cash and cash equivalents is low, and thus holding unnecessary cash lowers the firm's profitability. Second, since the use of cash assets is nearly insulated from investor monitoring, excess cash could destroy shareholder wealth by encouraging the opportunistic behavior of managers (Jensen, 1986; Harford, 1999). Furthermore, cash holdings could strengthen managerial entrenchment because they

provide managers tools to protect their corporate control from investors' disciplinary actions (Faleye, 2004).

Prior studies find evidence that supports both motives. Haushalter et al. (2007) and Morellec et al. (2013) find that firms operating in highly competitive product markets are likely to reserve more cash as a hedging method. Frésard (2010) shows that cash holding is helpful to expand market share. In addition, firms whose cash flow is expected to be volatile reserve more cash assets to protect themselves from the downside effect of financial distress or economic downturns (Larkin, 2013; Hoberg et al., 2014). Because of the practical usefulness of cash reserves, cash holdings due to precautionary motives are valued highly by investors (Faulkender and Wang, 2006). These studies support the precautionary motive of cash holdings.

Another line of research papers suggests that agency problems arise from cash holdings. Managers have a tendency to easily spend incremental cash in unprofitable investment opportunities (Blanchard et al., 1994). Since the use of cash holdings is not easy to monitor, managers of firms that have large cash holdings tend to easily spend their money on value destroying investments (Harford, 1999). Thus the value of cash holdings of firms with weak corporate governance is discounted in the market because those firms are vulnerable to agency problems (Dittmar and Mahrt-Smith, 2007).

Several international studies find evidence that firms in weak investor protection regimes have large cash reserves (Dittmar et al., 2003; Kalcheva and Lins, 2007). Dittmar et al. (2003) suggest the difference to be the result of agency motives by showing that the result is robust to the control of accessibility to capital market. Kalcheva and Lins (2007) find that entrenched managers have more cash and that the effect becomes stronger in weak investor control countries. As a consequence, market participants react to the risk of potential agency problems raised by cash holdings (Dittmar and Mahrt-Smith,

2007). At the international level, the value of cash holdings is also higher for firms with good governance than for poorly governed firms (Kalcheva and Lins, 2007).

Especially important in the context of this study, country level investor protection is also effective in mitigating investor concerns about agency problems, as well as firm-level governance. Dittmar et al. (2003) show that firms in weak investor protection regimes tend to have more cash, which implies that country level investor protection reduces the manager's incentives for unnecessary cash holdings. Harford et al. (2008) find that cash holdings decrease in weakly governed U.S. firms, and argue that the firms in strong investor protection regimes reduce cash holdings when firms are vulnerable to agency problems. Yun (2009) also reports that U.S. listed firms with poor governance are forced to reduce cash holdings. As a consequence, cash holdings are valued at low levels in weak investor protection regimes (Pinkowitz et al., 2006). In addition, being cross-listed on the U.S. market improves the valuation of the cash holdings of firms in weak investor protection regimes (Frésard and Salva, 2010).

2.2 Accruals Quality

Researchers point out that the quality of accounting information is mainly determined by the quality of accruals because accruals reflect manager prediction and judgement on the firm's operations, especially when compared to operating cash flows. Hence, prior studies utilize the quality of accruals to measure the quality of accounting (Dechow and Dichev, 2002; Hutton et al., 2009). Accounting is considered to be an important channel to reduce information asymmetry between informed investors and uninformed investors (Easley and O'Hara, 2004). Therefore accruals quality is an appropriate proxy for a firm's opacity.

Prior studies find evidence that supports the conjecture that accruals quality is an adequate proxy of firm opacity. Several studies find that required returns decrease with

accruals quality (Francis et al., 2005; Kim and Qi, 2010; Ogneva, 2012). Bharath et al. (2008) argue that firms with low accruals quality rely on private borrowing because they have limited access to public debt markets. These studies suggest that firms with low accruals quality experience large market friction in external financing and thus require alternative financing sources for urgent financial needs.

Dechow and Dichev (2002) suggest that accruals quality is determined by errors in accruals regarding expected future operating cash flows. The paper defines low accruals quality to be when this aforementioned error is volatile. They point out that the volatility of operating characteristics affect the quality of accruals, and managerial opportunism is not the primary determinant of accruals quality. In other words, accruals quality need not be interpreted in the context of agency problem, although a portion of errors in accruals may be created by managerial misconduct.

Dechow and Dichev (2002) show that accruals quality is determined by several aspects of firm characteristics on operating volatility, e.g., the length of operating cycle, firm size, volatility of cash flows, the magnitude of accruals, and the reporting of negative earnings (Francis et al., 2004). However, the part of accruals not explained by these factors, discretionary accruals quality, is not necessarily a proxy of managers' opportunistic financial reporting (Guay et al., 1996; Subramanyam, 1996). The discretion in financial reporting could enhance the informativeness of financial statements by reflecting private information of managers. Alternatively, discretionary accruals quality could reflect operating volatility that is not captured by the factors that are utilized in estimating the normal level of accruals quality.

2.3 Country Level Investor Protection

Country level investor protection is the fundamental of corporate governance mechanisms because it defines the disciplinary

tools that investors can access and utilize to penalize controlling insiders, including both managers and controlling shareholders (La Porta et al., 1997; La Porta et al., 1998, 2000b, 2000a; Djankov et al., 2008).

Country level investor protection has actual impacts on several aspects. Investor protection improves the quality of financial reporting by reducing managers' incentives to pursue private benefits through opaque financial reporting. Leuz et al. (2003) find that the country level opacity of financial reporting decreases with the strength of country level investor protection. Thus, investor protection helps investors monitor and understand firms better.

In combination with transparent financial reporting, the reduction of potential expropriation from insiders reduces the cost of capital. Bhattacharya and Daouk (2002) find that the enforcement of insider trading laws reduces the cost of equity. Hail and Leuz (2006) also report that country level investor protection reduces cost of equity. As a consequence, firms that are subject to weak investor protection but also cross list on U.S. stock markets enjoy the low cost of equity of a strong investor protection regime (Hail and Leuz, 2009), which leads to a higher valuation (La Porta et al., 2002).

Strong investor protection regimes also lead to a more active and developed financial market (La Porta et al., 1997; La Porta et al., 1998). In addition, the developed financial market under investor protection improves investment efficiency by providing better access to capital (Biddle and Hilary, 2006), which affects the incentives to save cash assets.

2.4 Prior Studies on Accruals Quality and Cash Holdings

Related to this study, García-Teruel et al. (2009) examined the relation between accruals quality and cash holdings using firms listed on the Spanish stock exchange. Using the absolute value of residual accruals calculated by Dechow and Dichev (2002) model as the proxy for accruals quality, they

find that cash holdings decrease with higher accounting quality. They argue that cash holdings decrease with accruals quality because improved high quality financial reporting reduces adverse selection costs and agency costs so that firms with good accruals quality would not need large cash reserves. Sun et al. (2011) also examine the same topic and find similar results by using data on firms listed on U.S. stock market. In addition, Sun et al. (2011) also suggest that the value of cash holdings is higher in firms with good accruals quality.

The aforementioned studies are different from this study in several points. First, they analyze firms listed on one specific stock exchange, and hence their findings provide little knowledge about the influence of a country's institutional environment on the sensitivity of cash holdings to financial reporting quality. This study reexamines the same topic using international data, which enables this study to provide a more comprehensive understanding about accruals quality and cash holding decisions. Second, García-Teruel et al. (2009) and Sun et al. (2011) focus on the agency motive of cash holdings more than the precautionary motive. As recent evidence generally shows that precautionary motives are the strongest driver of cash holdings (e.g. Bates et al., 2009), the focus on precautionary motives in this study will provide richer implications.

III. Hypothesis Development

The quality of financial reporting is measured by accruals, because accruals incorporate information about future operating cash flows and manager discretion. However, accruals are also influenced by operating characteristics (Kothari et al., 2005; Dechow and Dichev, 2002), especially when the volatility of operation makes accruals an imprecise estimate of future cash flows. Therefore, the quality of accruals decreases with the operating volatility of the firm, even when there is no opportunistic financial reporting.

Operating volatility also affects the level of cash holdings. Prior studies on cash holdings generally agree that precautionary motives are the prime determinants of cash holdings. Prior studies find that firms with a high level of operating volatility reserve large cash holdings for precautionary purposes (Haushalter et al., 2007; Hoberg et al., 2014; Larkin, 2013). Therefore, both accounting opacity, measured by accruals quality, and cash holdings increase with operating volatility. Based on the conjecture above, the first hypothesis is presented as follows:

H1: Cash holdings will increase with the opaqueness of accounting information.

Reserving large cash assets could encourage managers to utilize the money easily for their own benefits because of the difficulty of monitoring the use of internal cash reserves. Corporate governance mechanisms have been found to be important in preventing the inefficient allocation of internal cash reserves (Harford et al., 2008). Among several corporate governance mechanisms, in international settings, country level investor protection is the most important aspect of corporate governance because country level investor protection provides the tools and ability to discipline managers. If managers have to disclose their decisions and bear legal responsibility about the use of cash assets, managers are less likely to spend cash holdings for private benefits. Consequently, investors would worry less about the agency problem caused by large cash balances.

Ex post disciplinary mechanisms, which are guaranteed by the legal system, are more valuable for the investors of opaque firms since managers of those firms cannot easily be monitored *ex ante*. In addition, some firms are opaque not because of managers' opportunistic disclosure policies but because of the nature of their operations (Morgan, 2002; Srivastava, 2014). Monitoring firms that are opaque by nature are not easy even for sophisticated investors (Morgan, 2002; Flannery

et al., 2004). Hence, for those firms, *ex ante* disciplinary actions may not be effective whereas *ex post* disciplinary actions would still be effective.⁴⁾

Overall, in strong investor regimes, agency problems can be effectively penalized. Thus investors would allow managers to have more financial slack, i.e. cash holdings because they would have less concerns about agency problems than investors in weak investor regimes. As a consequence, the positive relation between cash holdings and opacity of accounting is likely to be stronger with the strength of investor protection. Based on the argument above, the second hypothesis is suggested as follows:

H2: Country level investor protection enhances the positive association between cash holdings and accounting opacity.

IV. Research Design

The main research model of this study is formulated by modifying the research model of Opler et al. (1999).

$$CASH_{it} = \alpha_0 + \alpha_1 AQ_{it} + \alpha_2 CountryFactor + \alpha_3 AQ_{it} \times CountryFactor + \alpha \cdot Controls + \epsilon_{it} \quad (1)^5$$

The dependent variable is natural logarithm

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- 4) Harford et al. (2008) find a negative relation between cash holdings and governance mechanisms. Their finding does not contradict the above conjecture because their research setting is different from that of this study in two aspects. First, they do not consider opacity. Second, they measure *ex ante* governance mechanisms for their tests.
- 5) Because this study is about the association between AQ and cash holdings, AQ_t is used, instead of AQ_{t-1} because AQ_t is a more concurrent observation than AQ_{t-1} . In addition, prior studies on AQ do not document a significant difference between using AQ_t and AQ_{t-1} . This is reasonable as the AQ measure, calculated by the definition of Dechow and Dichev (2002), requires observations of at least 2 prior years. Therefore, this one year difference is not critical.

of cash and cash equivalents divided by total assets excluding cash and cash equivalents.⁶⁾ One of main independent variables, AQ, is an accruals quality measure calculated by the method suggested by McNichols (2002), except that the standard deviation is taken for three years of residual current accruals. Another main independent variable, Protection, indicates the measure of country level investor protection. This study use four measures of investor protection: (1) the indicator variable for common law countries (La Porta et al., 1998), (2) the self-dealing index suggested by Djankov et al. (2008), and the strength of public enforcement and private enforcement suggested by Bushman and Piotroski (2006) ((3) and (4)).

The control variables are firm size, net working capital, R&D expenses, operating cash flow, leverage, the change in sales, market-to-book ratio of equity, capital expenditures and dividends payout (Harford et al., 2008; Opler et al., 1999). Definitions of variables are in the appendix. Year dummy variables and industry dummy variables, set by the Fama-French 48 industry classification, are also included in the control variables. Clustered robust standard errors are applied in the main test to control correlation within firm observations.

AQ is calculated by the following procedure. First, the modified Dechow-Dichev model is estimated by year and the 48 industries of the Fama-French classification (McNichols, 2002; Francis et al., 2005).

$$TCA_t = \gamma_0 + \gamma_1 OCF_{t-1} + \gamma_2 OCF_t + \gamma_3 OCF_{t+1} + \gamma_4 \Delta SALES_t + \gamma_5 PPE_t + \epsilon \quad (2)$$

6) Both García-Teruel et al. (2009) and Sun et al. (2011) use cash and cash equivalent divided by net assets, i.e. total assets less cash and cash equivalent, without taking natural logarithm, as their dependent variable. However, as the descriptive statistics of García-Teruel et al. (2009) shows, the ratio of cash to net asset is strictly right skewed, which violates the assumption of the ordinary least squares method. As this can lead to imprecise results, this paper uses the logarithm to address this issue.

Industry-years with less than 50 observations are removed from estimation of equation (2).⁷⁾ The volatility of residuals of equation (2) from year t-2 to t is defined as AQ.⁸⁾

$$AQ_t = \sigma(\epsilon) \quad (3)$$

To analyze the source of the volatility of discretionary accruals, AQ is separated into innate AQ (IAQ) and discretionary AQ (DAQ) by the following method (Francis et al., 2005). First, AQ is regressed on the variables that affect the volatility of accruals, i.e., size (SIZE), standard deviation of OCF and Sales for year t-2 to t ($\sigma(OCF)$ and $\sigma(SALES)$, respectively), operating cycle (OpCycle), and the number of negative earnings from year t-2 to t. Then the part of AQ that is explained by these variables and the residuals are defined as IAQ and DAQ, respectively.

$$AQ_{it} = \lambda_0 + \lambda_1 SIZE_{it} + \lambda_2 \sigma(ODF_i) + \lambda_3 \sigma(SALES_i) + \lambda_4 OpCycle_{it} + \lambda_5 NegEarn_{it} + \mu_{it} \quad (4)$$

$$IAQ_{it} = \widehat{AQ}_{it} \quad (5)$$

$$DAQ_{it} = AQ_{it} - \widehat{IAQ}_{it} \quad (6)$$

7) If a firm's headquarter is registered in tax heaven, e.g. Cayman Island, Mermuda, Morocco, or Cyprus, the firm observations are excluded from the sample. As these companies run most of their main operations in non-tax-heaven area(s), the jurisdiction that has the right to monitor and discipline these companies is not clear.

8) When time period of 5 years is applied as in Francis et al. (2005), the sample size becomes too small to obtain validity of the analysis because several country observations in Compustat Global do not have five consecutive year observations. Thus this study uses a time period of 3 years for the calculation of the standard deviation. Instead, the robustness of the results of this study is checked by using the AQ measure calculated following Francis et al. (2005). The results are qualitatively consistent.

V. Sample and Descriptive Statistics

5.1 Sample

Financial statement data, exchange rates, and stock prices are obtained from the Compustat Global database.⁹⁾ The sample of this study covers observations from 1990 to 2010. Firms that have their headquarters in tax heaven countries, e.g. Cayman Islands, are excluded because the legal institution that effectively governs those firms

is unclear. Companies in the financial industry and regulated industries, such as utility industry, are also excluded from final sample. The final sample is composed of 18,071 firm-year data from 24 countries.

5.2 Descriptive Statistics

Descriptive statistics of firm and country characteristics are shown in panel A and panel B of Table 1, respectively. In Panel A, the mean values of AQ, IAQ and DAQ

Table 1
Descriptive Statistics

Panel A: Firm characteristics

Variable	N	Mean	STD	10%	25%	50%	75%	90%
AQ	18,071	0.047	0.053	0.009	0.016	0.030	0.057	0.102
IAQ	18,071	0.050	0.023	0.027	0.035	0.046	0.060	0.078
DAQ	18,071	-0.003	0.047	-0.040	-0.028	-0.013	0.006	0.041
CASH	18,071	-2.231	1.125	-3.733	-2.881	-2.127	-1.475	-0.894
CASH_UNADJ	18,071	0.185	0.219	0.024	0.056	0.119	0.229	0.409
SIZE	18,071	5.582	1.782	3.395	4.453	5.504	6.644	7.889
NWC	18,071	0.034	0.186	-0.198	-0.081	0.035	0.155	0.273
R&D	18,071	0.017	0.059	0.000	0.000	0.000	0.015	0.045
OCF	18,071	0.063	0.085	-0.026	0.022	0.062	0.106	0.162
LEV	18,071	0.198	0.164	0.001	0.052	0.177	0.306	0.426
ΔSALES	18,071	0.063	0.196	-0.125	-0.024	0.043	0.140	0.288
σ (SALES)	18,071	0.109	0.132	0.019	0.035	0.068	0.132	0.239
P/B	18,071	1.723	2.646	0.431	0.686	1.131	1.965	3.241
DIV	18,071	0.011	0.021	0.000	0.000	0.005	0.013	0.031
CAPEX	18,071	0.049	0.052	0.005	0.014	0.033	0.065	0.111

Note: Final sample has 18,071 firm-year observations from 24 countries. Sample period is from 1990 to 2010. AQ is the standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t. IAQ and DAQ are respectively the expected value and residuals of the regression of AQ on size, standard deviation of cash flows from operation, standard deviation of sales, operating cycle, and number of negative earnings from t-2 to t. CASH_UNADJ is cash & cash equivalent divided by net assets. CASH is the natural logarithm of CASH_UNADJ. SIZE is the natural logarithm of net assets in U.S. \$ million. NWC is total current assets less cash & cash equivalents and total current liabilities, divided by net assets. R&D is research and development expenses divided by sales. OCF is cash flows from operation divided by average total assets, if cash flows from operations are available. Otherwise, income before extraordinary less total accruals, which is calculated from balance sheet, scaled by average total assets are defined as OCF. The change of total current assets and the change of short-term debt less the change of total current liabilities, the change of cash & cash equivalents, and depreciation expenses is total accruals calculated from balance sheet (Francis et al., 2005). LEV is long-term debt and short-term divided by total assets. ΔSALES is the change in sales divided by average total assets. σ (SALES) is the standard deviation of sales divided by average total assets from t-2 to t. P/B is the ratio of market value of equity to book value of equity. DIV is cash dividends divided by average total assets. CAPEX is Capital expenditure divided by average total assets.

9) Firms listed on U.S. stock markets are excluded because of validity issues. The size of U.S. stock market observations is significantly larger than the final sample of this study, which would have the U.S. stock market observations drive the result.

Panel B: Country characteristics

Country	N	CL	ASD	PUB	PRV
Australia	944	1	0.76	0.90	0.71
Belgium	67	0	0.54	0.15	0.43
China	993	0	0.76	NA	NA
Denmark	72	0	0.46	0.37	0.57
France	598	0	0.38	0.77	0.49
Germany	32	0	0.28	0.22	0.21
Greece	143	0	0.22	0.32	0.41
Hong Kong	210	1	0.96	0.87	0.79
India	1,188	1	0.58	0.67	0.79
Israel	114	1	0.73	0.63	0.66
Japan	7,573	0	0.50	0.00	0.71
Korea	50	0	0.47	0.25	0.71
Malaysia	1,072	1	0.95	0.77	0.79
Mexico	122	0	0.17	0.35	0.35
Netherlands	169	0	0.20	0.47	0.69
Pakistan	105	1	0.41	0.58	0.48
Poland	131	0	0.29	NA	NA
Singapore	482	1	1.00	0.87	0.83
South Africa	233	1	0.81	0.25	0.75
Switzerland	74	0	0.27	0.33	0.55
Taiwan	1,294	0	0.56	0.52	0.71
Thailand	101	1	0.81	0.72	0.57
Turkey	86	0	0.43	0.63	0.36
United Kingdom	2,118	1	0.95	0.68	0.75
Total	18,071				

Note: Panel B reports country institutional characteristics. CL is indicator variable for common law origin (La Porta et al., 1998). ASD is anti-self-dealing index by Djankov et al. (2008). PUB and PRV are measures for public enforcement and private enforcement suggested by Bushman and Peiotroski (2006) and La Porta et al. (2006).

are approximately 0.047, 0.050, and -0.003, respectively. The absolute value of the mean (median) is the smallest for DAQ, but the standard deviation of DAQ is larger than that of IAQ. CASH is the natural logarithm of CASH_UNADJ, i.e. cash to net asset ratio. The mean (median) value of CASH_UNADJ is 18.5% (11.9%), meaning that the cash to net asset ratio is right skewed.¹⁰⁾ Panel B reports institutional characteristics of the countries of the observations in the final sample. This study uses several country level variables for two reasons. First, using several variables helps mitigate the bias that comes from errors in the variable (Spamann, 2010; Djankov et al., 2008). Se-

cond, using several measures is helpful to examine which component of investor protection is effective in addressing cash holding decisions (Bushman and Piotroski 2006; Bushman et al., 2004). Table 2 reports Pearson correlation coefficients among firm level variables. Coefficients in bold indicate significance at 5% in a two-tailed test. The main variables, AQ and CASH are insignificantly associated. However, this result is not conclusive since several determinants of cash holdings are not controlled. In addition, H2 cannot be tested by the Pearson correlation coefficient since it requires conditioning by the investor protection variable.

10) Thus, the regressions that adopt the raw value of cash to net asset (or total asset) ratio as dependent variables violates the assumption of ordinary-least-square estimation.

Table 2
Pearson Correlation Coefficients

Variable	CASH	CASH_UNADJ	AQ	IAQ	DAQ	SIZE	R&D
AQ	0.010	0.085					
IAQ	0.034	0.137	0.458				
DAQ	-0.005	0.029	0.904	0.033			
SIZE	-0.114	-0.237	-0.278	-0.660	0.005		
R&D	0.159	0.201	0.041	0.063	0.016	-0.026	
OCF	0.085	0.059	-0.079	-0.249	0.031	0.129	-0.075
LEV	-0.389	-0.350	-0.036	-0.058	-0.012	0.231	-0.104
ΔSALES	-0.029	-0.031	0.073	0.021	0.072	-0.015	-0.041
σ (SALES)	-0.003	0.041	0.334	0.619	0.077	-0.204	-0.036
P/B	0.057	0.079	0.120	0.086	0.093	-0.032	0.085
DIV	0.053	0.085	-0.020	-0.087	0.020	-0.010	-0.031
CAPEX	-0.106	-0.090	0.023	-0.029	0.040	0.013	-0.037

Variable	OCF	LEV	ΔSALES	σ(SALES)	P/B	DIV
LEV	-0.144					
ΔSALES	0.163	-0.052				
σ (SALES)	-0.023	-0.021	0.171			
P/B	0.096	0.028	0.132	0.095		
DIV	0.345	-0.195	0.116	0.022	0.179	
CAPEX	0.205	0.072	0.141	0.028	0.073	0.086

Note: Final sample has 18,071 firm-year observations from 24 countries. Sample period is from 1990 to 2010. Bold values are significant at 5% level of two-tailed test. AQ is the standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t. IAQ and DAQ are respectively the expected value and residuals of the regression of AQ on size, standard deviation of cash flows from operation, standard deviation of sales, operating cycle, and number of negative earnings from t-2 to t. CASH_UNADJ is cash & cash equivalent divided by net assets. CASH is the natural logarithm of CASH_UNADJ. SIZE is the natural logarithm of net assets in U.S. \$ million. NWC is total current assets less cash & cash equivalents and total current liabilities, divided by net assets. R&D is research and development expenses divided by sales. OCF is cash flows from operation divided by average total assets, if cash flows from operations are available. Otherwise, income before extraordinary less total accruals, which is calculated from balance sheet, scaled by average total assets are defined as OCF. The change of total current assets and the change of short-term debt less the change of total current liabilities, the change of cash & cash equivalents, and depreciation expenses is total accruals calculated from balance sheet (Francis et al., 2005). ΔLEV is long-term debt and short-term divided by total assets. ΔSALES is the change in sales divided by average total assets. σ (SALES) is the standard deviation of sales divided by average total assets from t-2 to t. P/B is the ratio of market value of equity to book value of equity. DIV is cash dividends divided by average total assets. CAPEX is Capital expenditure divided by average total assets.

5.3 Accruals Quality and Cash Holdings

Figure 1 illustrates how the average of cash holdings varies according to AQ decile. Panel A, Panel B and Panel C show the average of CASH by AQ decile, IAQ decile, and DAQ decile, respectively.¹¹⁾ To compare the difference between code law countries and common law countries, the trend is depicted separately by the origin of the legal system.

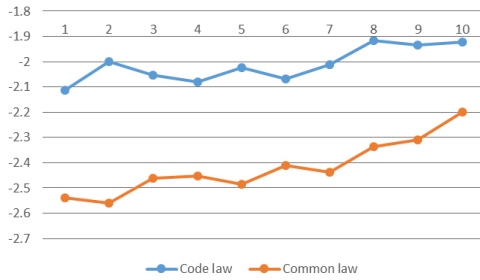
In all AQ deciles, including IAQ and DAQ, firms in code law countries have more liquid assets than firms in common law countries (Dittmar et al., 2003). In Panel A and Panel B, cash holdings generally increase with the AQ decile and IAQ decile in both regimes. However, the slope is larger in common law countries, whereas the trend is more robust in code law countries. These trends are generally consistent with the argument of prior studies. However, in Panel C, the trend is not monotonic. In general, it is more like a U-shape graph.

Figure 1 provides two important implica-

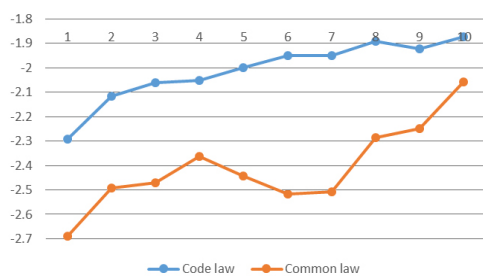
11) Since CASH is natural logarithm of the ratio between 0 to 1, CASH is negative. Thus the value on the vertical axis is negative.

Figure 1
Average CASH of AQ-sorted decile

Panel A: Total accruals quality decile
CASH - AQ decile



Panel B: Innate accruals quality decile
CASH - IAQ decile



Panel C: Discretionary accruals quality decile
CASH - DAQ decile



Note: Vertical axis indicates the value of the average of CASH, defined as the natural logarithm of cash & cash equivalent divided by net assets. AQ is the standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t. IAQ and DAQ are respectively the expected value and residuals of the regression of AQ on size, standard deviation of cash flows from operation, standard deviation of sales, operating cycle, and number of negative earnings from t-2 to t.

tions. First, firms in strong investor protection regimes, i.e. common law countries, have less liquid assets than firms in weak investor protection regimes. Second, the sensitivity of cash holdings to AQ is larger in common law countries. However, this implication has its limitations. As several studies have found, the level of cash holdings is determined by several factors, which are not considered in Figure 1. Following analyses will further investigate the relation between AQ and cash holdings.

VI. Main Results

6.1 Accruals Quality and Cash Holdings

Column (1) of Table 3 documents the re-

lation between accruals quality and cash holdings. AQ is positively related to the level of cash holdings, implying that cash holdings decrease with accruals quality. To examine which part of accruals quality is related to cash holdings, cash holdings is regressed on innate AQ (IAQ) and discretionary AQ (DAQ). Column (2) shows that cash holdings is sensitive to DAQ but not to IAQ. Although these results are consistent with prior studies, they are not necessarily interpreted as evidence supporting prior studies that highlight agency problems (García-Teruel et al., 2009; Sun et al., 2011). Several prior studies, e.g. Opler et al. (1999) and Bates et al. (2009), point out that the precautionary motive is the main driver of

Table 3
Accruals Quality on Cash Holdings

VARIABLES	(1)	Full sample	(2)
AQ	0.439** (1.97)		
IAQ			1.157 (1.42)
DAQ			0.399* (1.76)
SIZE	-0.079*** (-10.72)		-0.074*** (-8.20)
NWC	-0.439*** (-6.56)		-0.442*** (-6.59)
R&D	1.733*** (6.86)		1.721*** (6.81)
OCF	0.991*** (8.24)		1.013*** (8.38)
LEV	-2.264*** (-29.53)		-2.271*** (-29.21)
ΔSALES	-0.092** (-2.11)		-0.087** (-2.00)
σ(SALES)	0.223*** (2.83)		0.163 (1.57)
P/B	0.026*** (5.91)		0.026*** (5.87)
DIV	3.116*** (5.35)		3.160*** (5.43)
CAPEX	-0.677*** (-3.18)		-0.670*** (-3.14)
Ind. dummy	Yes		Yes
Year dummy	Yes		Yes
Country dummy	Yes		Yes
Observations	18,071		18,071
Adj. R ²	0.324		0.324

Note: Dependent variable is the natural logarithm of cash & cash equivalents divided by net assets. AQ is the standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t. IAQ and DAQ are respectively the expected value and residuals of the regression of AQ on size, standard deviation of cash flows from operation, standard deviation of sales, operating cycle, and number of negative earnings from t-2 to t. CASH_UNADJ is cash & cash equivalent divided by net assets. CASH is the natural logarithm of CASH_UNADJ. SIZE is the natural logarithm of net assets in U.S. \$ million. NWC is total current assets less cash & cash equivalents and total current liabilities, divided by net assets. R&D is research and development expenses divided by sales. OCF is cash flows from operation divided by average total assets, if cash flows from operations are available. Otherwise, income before extraordinary less total accruals, which is calculated from balance sheet, scaled by average total assets are defined as OCF. The change of total current assets and the change of short-term debt less the change of total current liabilities, the change of cash & cash equivalents, and depreciation expenses is total accruals calculated from balance sheet (Francis et al., 2005). æLEV is long-term debt and short-term divided by total assets. ΔSALES is the change in sales divided by average total assets. σ (SALES) is the standard deviation of sales divided by average total assets from t-2 to t. P/B is the ratio of market value of equity to book value of equity. DIV is cash dividends divided by average total assets. CAPEX is Capital expenditure divided by average total assets. Final sample has 18,071 firm-year observations from 24 countries. Sample period is from 1990 to 2010. Standard errors are adjusted by firm cluster. *, **, *** indicate significance levels of 10%, 5%, 1%, respectively.

cash holdings, which implies that cash holdings would increase with the volatility of operations (Morellec et al., 2013; Hoberg et al., 2014). Accruals quality is related to volatility of operations, and thus the posi-

tive relation can be interpreted as precautionary cash holdings increasing with the volatility captured in accruals quality. Following analyses of this study will provide more evidence that supports this interpretation.

6.2 The Origin of Law, Cash Holdings, and Accruals Quality

If the driver of the positive relation between AQ and cash holdings in Table 3 is because of agency motives, we can expect the positive relation to be weaker in strong investor protection regimes because strong investor protection provides investors tools to monitor and discipline managerial activities, reducing managers' incentives for self-serving transactions. Or, in extreme cases, AQ and cash holdings should be negatively associated in strong investor protection regimes as the accumulation of liquid assets in opaque firms would be penalized. Examining the influence of investor protection on the sensitivity of cash holdings to AQ would reveal the real driver of the positive relation.

The legal system of a country determines the level of investor protection (La Porta et al., 1997). Following the argument of La Porta et al. (1998) that common law countries have better investor protection than code law countries, I dichotomize the sample by the origin of law in the country of the firm and estimate the models in table 4. Column (1) and (2) of Table 4 have the results for code law countries, and column (3) and (4) show the results for common law countries.

Column (1) shows that in code law countries, cash holding is insignificantly related to AQ. On the other hand, in column (3), the relation is significantly positive for common law countries. These results refute the argument that agency motives drive the positive relation between AQ and cash holdings. If the agency problem is the main driver of the positive relation, the relation should be more strongly positive in code law countries than in common law countries because the legal system in code law countries provide weak methods to penalize agency motives. Thus opaque firms in this regime should rely on private borrowings (Biddle and Hilary, 2006; La Porta et al., 1997), which reduces the incentives of cash holdings.¹²⁾

Then, why do cash holdings increase with AQ in common law countries? As several research papers have pointed out, accruals are affected by firm characteristics that are related to the volatility of firm operations (Kothari et al., 2005; Dechow and Dichev, 2002). Since the holding of excess cash holdings is more easily monitored and penalized in strong investor protection regimes (Yun, 2009), managers in such regimes would be more careful in saving and spending of cash assets. On the other hand, the hedge purpose of cash holdings, or in other words, precautionary cash holdings, could be more acceptable in strong investor protection regimes. As a consequence of precautionary cash holdings, investment efficiency could be improved in strong investor protection regimes (Biddle et al., 2009; Almeida et al., 2004). Table 4 supports this conjecture.

To further confirm our argument, we run equation (1) with full sample using CL and ASD as measures of investor protection.¹³⁾ Column (1) and (2) of Table 5 shows the results by using an indicator variable for common law countries (CL) as the measure for investor protection. Column (3) and (4) present results using the anti-self-dealing index (ASD) as the investor protection measure.¹⁴⁾ The interaction terms between AQ

12) If external financing from public is available, firms can minimize financing cost by issuing securities when conditions are favorable and reserving a large cash balance until it is necessary (McLean, 2011).

13) Although Table 4 examines the influence of CL, CL is applied for the analyses of Table 5 because of two reasons. First, we can compare overall difference of cash holdings between common law countries and code law countries, whereas in Table 4, we cannot compare the difference of the level of cash holdings according to the origin of law because regressions were estimated separately. In addition, the results in table 4 are hard to be compared quantitatively since they are estimated using subsamples which are mutually exclusive.

14) This study uses more than one measure of country level investor protection because of the comprehensive nature of investor protection.

and the measure for investor protection are positively related to cash holdings, implying that the cash holdings of opaque firms increase with investor protection. These results are qualitatively the same as the results in the previous table. In addition, both the common law dummy variable and the anti-self-dealing index are negatively related to cash holdings, implying that cash holdings are lower in strong investor protection regimes, which is consistent with previous studies (Dittmar et al., 2003; Kalcheva and Lins, 2007). Agency problems related to cash holdings can be properly suppressed by country level investor protection, and firms in these strong protection regimes preserve more cash holdings than those in weak investor protection regimes.

Which part of accruals quality is more important in the relation between AQ and cash holdings? Prior studies point out that the accruals quality is determined not only by the discretionary decisions of managers, but also by operating characteristics (Dechow and Dichev, 2002; Francis et al., 2005). Operating characteristics are related to operating volatility and the precautionary motive of cash holdings, and thus innate accruals quality could be positively related to cash holdings in strong investor regimes. Discretionary accruals quality can reflect the manager's private information, the manager's opportunistic financial reporting, or operating uncertainty that is not captured by the determinants in equation (4). If agency motives mainly determine discretionary accruals quality, discretionary accruals quality would be negatively associated with cash holdings under stronger investor protection, especially because large cash holdings could trigger investor activism (Yun 2009). On the other hand, if discretionary accruals are positively related to cash holdings under stronger investor protection, agency motives cannot be the main driver of the positive relation between AQ and cash holdings.

The conjecture above is tested by dividing AQ into IAQ and DAQ, following the method of Francis et al. (2005). Column (2) and (4) of Table 5 show the result of

the analyses. In column (2), both IAQ and DAQ have insignificant coefficients. On the other hand, the interaction term between common law dummy variable and IAQ (DAQ) has a positive coefficient, indicating that both types of accounting opacity lead to larger cash holdings in common law countries than in code law countries. By using the Anti-Self-Dealing Index (ASD) as the proxy for investor protection, the influence of investor protection is further examined. Results are presented in column (3) and (4) of Table 5, which are consistent with those in column (1) and (2). The interaction terms of ASD and accruals quality measures are all positive, showing that the results are robust to the change of the measure for investor protection.

In sum, the results in Table 5 support the conjecture that the positive sensitivity of cash holdings to accruals quality is mainly driven by precautionary motives. Both innate and discretionary accruals quality measure are positively related to cash holdings in strong investor protection regimes, which implies that volatile firms are allowed to save more cash for precautionary motives if investors' property rights are well protected in the economy. The results also show that accruals quality have information that affect firms' financing decisions.

Finally, the difference between the argument of this study and that of a prior study, e.g. Dittmar et al. (2003), is worth being mentioned. The main argument of this study is about the relation between accounting opacity and cash holdings in an international setting, but not about the level of cash holdings. Thus, our main findings do not contradict the arguments of prior papers. Furthermore, this study has a common result with Dittmar et al. (2003). In column (1) and (2), the coefficient of CL is significantly negative, indicating that the overall level of cash holdings is lower in common law countries, which is consistent with Dittmar et al. (2003). They find that cash holdings are smaller in countries with strong investor protection. In column (3) and (4), ASD has negative coefficients, which supports Dittmar et al. (2003) as well.

Table 4
The Relation between Cash Holdings and Accruals Quality by the Origin of Law

VARIABLES	(1)	(2)	(3)	(4)
	Code law		Common Law	
AQ	0.166 (0.48)		0.637** (2.21)	
IAQ		-0.630 (-0.61)		1.633 (1.33)
DAQ		0.204 (0.59)		0.580* (1.96)
SIZE	-0.087*** (-10.04)	-0.092*** (-8.71)	-0.058*** (-4.39)	-0.051*** (-3.14)
NWC	-0.436*** (-5.33)	-0.432*** (-5.26)	-0.299*** (-2.60)	-0.301*** (-2.61)
R&D	2.641*** (6.11)	2.669*** (6.15)	1.367*** (4.88)	1.359*** (4.85)
OCF	1.546*** (9.97)	1.526*** (9.82)	0.621*** (3.51)	0.656*** (3.68)
LEV	-1.970*** (-21.44)	-1.959*** (-20.86)	-2.644*** (-19.15)	-2.650*** (-19.08)
ΔSALES	-0.149*** (-2.85)	-0.156*** (-2.98)	-0.023 (-0.32)	-0.018 (-0.26)
σ(SALES)	0.216** (1.96)	0.284** (1.98)	0.270** (2.54)	0.188 (1.29)
P/B	0.020** (2.48)	0.021** (2.54)	0.028*** (5.57)	0.028*** (5.53)
DIV	6.830*** (6.16)	6.771*** (6.10)	2.567*** (3.80)	2.618*** (3.88)
CAPEX	-1.494*** (-5.22)	-1.507*** (-5.26)	-0.116 (-0.39)	-0.110 (-0.36)
Ind. dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Country dummy	Yes	Yes	Yes	Yes
Observations	11,504	11,504	6,567	6,567
Adj. R ²	0.340	0.340	0.287	0.287

Note: Dependent variable is the natural logarithm of cash & cash equivalents divided by net assets. AQ is the standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t. IAQ and DAQ are respectively the expected value and residuals of the regression of AQ on size, standard deviation of cash flows from operation, standard deviation of sales, operating cycle, and number of negative earnings from t-2 to t. CASH_UNADJ is cash & cash equivalent divided by net assets. CASH is the natural logarithm of CASH_UNADJ. SIZE is the natural logarithm of net assets in U.S. \$ million. NWC is total current assets less cash & cash equivalents and total current liabilities, divided by net assets. R&D is research and development expenses divided by sales. OCF is cash flows from operation divided by average total assets, if cash flows from operations are available. Otherwise, income before extraordinary less total accruals, which is calculated from balance sheet, scaled by average total assets are defined as OCF. The change of total current assets and the change of short-term debt less the change of total current liabilities, the change of cash & cash equivalents, and depreciation expenses is total accruals calculated from balance sheet (Francis et al., 2005). ΔLEV is long-term debt and short-term divided by total assets. ΔSALES is the change in sales divided by average total assets. σ(SALES) is the standard deviation of sales divided by average total assets from t-2 to t. P/B is the ratio of market value of equity to book value of equity. DIV is cash dividends divided by average total assets. CAPEX is Capital expenditure divided by average total assets. Final sample has 18,071 firm-year observations from 24 countries. Sample period is from 1990 to 2010. Standard errors are adjusted by firm cluster. *, **, *** indicate significance levels of 10%, 5%, 1%, respectively. Column (1) and (2) show the results for code law countries, and column (3) and (4) show the results for common law countries.

Table 5
The Influence of Investor Protection on the
Relation between Cash Holdings and Accruals Quality

VARIABLES	(1)	(2)	(3)	(4)
	Protection = CL		Protection = ASD	
AQ	-0.923*** (-2.82)		-3.174*** (-4.54)	
Protection×AQ	1.566*** (3.72)		4.054*** (4.25)	
IAQ		-1.677* (-1.81)		-5.682*** (-3.46)
Protection×IAQ		1.961** (2.00)		5.514** (2.49)
DAQ		-0.849** (-2.48)		-2.887*** (-3.84)
Protection×DAQ		1.489*** (3.26)		3.770*** (3.63)
Protection	-0.629*** (-17.59)	-0.649*** (-10.79)	-0.662*** (-8.06)	-0.735*** (-5.58)
SIZE	-0.074*** (-10.23)	-0.078*** (-8.70)	-0.044*** (-6.04)	-0.055*** (-6.07)
NWC	-0.607*** (-9.10)	-0.605*** (-9.05)	-0.760*** (-11.31)	-0.752*** (-11.21)
R&D	1.567 (6.49)	1.573 (6.46)	1.477 (6.23)	1.496 (6.23)
OCF	0.874 (7.30)	0.863 (7.11)	0.892 (7.37)	0.849 (6.95)
LEV	-2.417*** (-31.30)	-2.407*** (-30.69)	-2.573*** (-32.40)	-2.549*** (-31.71)
ΔSALES	-0.106** (-2.40)	-0.110** (-2.47)	-0.179*** (-3.96)	-0.188*** (-4.15)
σ (SALES)	0.027 (0.34)	0.072 (0.69)	-0.094 (-1.21)	0.039 (0.37)
P/B	0.023 (5.49)	0.023 (5.52)	0.023 (5.29)	0.024 (5.38)
DIV	2.190 (3.73)	2.178 (3.72)	0.079 (0.14)	0.034 (0.06)
CAPEX	-1.058 (-4.98)	-1.068 (-5.02)	-1.548 (-7.23)	-1.560 (-7.29)
Ind. dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Observations	18,071	18,071	18,071	18,071
Adj. R ²	0.285	0.285	0.253	0.253

Note: Dependent variable is the natural logarithm of cash & cash equivalents divided by net assets. AQ is the standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t. IAQ and DAQ are respectively the expected value and residuals of the regression of AQ on size, standard deviation of cash flows from operation, standard deviation of sales, operating cycle, and number of negative earnings from t-2 to t. CASH_UNADJ is cash & cash equivalent divided by net assets. CASH is the natural logarithm of CASH_UNADJ. CL is indicator variable for common law origin (La Porta et al., 1998). ASD is anti-self-dealing index by Djankov et al. (2008). SIZE is the natural logarithm of net assets in U.S. \$ million. NWC is total current assets less cash & cash equivalents and total current liabilities, divided by net assets. R&D is research and development expenses divided by sales. OCF is cash flows from operation divided by average total assets, if cash flows from operations are available. Otherwise, income before extraordinary less total accruals, which is calculated from balance sheet, scaled by average total assets are defined as OCF. The change of total current assets and the change of short-term debt less the change of total current liabilities, the change of cash & cash equivalents, and depreciation expenses is total accruals calculated from balance sheet (Francis et al., 2005). ΔLEV is long-term debt and short-term debt divided by total assets. ΔSALES is the change in sales divided by average total assets. σ (SALES) is the standard deviation of sales divided by average total assets from t-2 to t. P/B is the ratio of market value of equity to book value of equity. DIV is cash dividends divided by average total assets. CAPEX is Capital expenditure divided by average total assets. Final sample has 18,071 firm-year observations from 24 countries. Sample period is from 1990 to 2010. Standard errors are adjusted by firm cluster. *, **, *** indicate significance levels of 10%, 5%, 1%, respectively. Column (1) and (2) show the results using indicator variable as the proxy for investor protection. Column (3) and (4) presents the results using anti-self-dealing index as the proxy for investor protection.

VII Additional Analysis

7.1 Private Enforcement and Public Enforcement

The proxies for investor protection aggregate several complex aspects of investor protection into one number. Thus previous tests provide little insight about the detailed mechanism of how institutional aspects affect the sensitivity of cash holdings to the quality of financial reporting.

To examine what aspect of enforcement is critical for the findings above, the influence of investor protection on the sensitivity of cash holdings to accruals quality is examined further by distinguishing private and public investor protection (La Porta et al., 2006; Bushman and Piotroski, 2006). Private enforcement mandates the disclosure of relevant information and describes liabilities for unfaithful disclosure. Private enforcement could help the investor's activity to recover their loss through lawsuits. However, the private effort of recovery could not be enough to protect investor property rights. Thus, public regulatory institutions (e.g. central banks, or U.S. Securities and Exchange Commission) are established to enforce investor protection. The question is on which aspect of enforcement would affect the cash holding decisions of opaque firms more.

Table 6 reports the results of the influence of private and public enforcement on the relation between accounting opacity and cash holdings. For brevity, the coefficients of control variables are omitted. In column (1), the results of public enforcement (PUB) are generally the same as the results for CL or ASD except that the coefficient of AQ is not significant. PUB has a significant and negative coefficient, and the interaction term between AQ and PUB has a significantly positive coefficient, which is consistent with prior results. On the other hand, in column

(2), PRV and its interaction term are insignificantly related to cash holdings. In sum, enforcement through public regulators affects the relation between opacity and cash holdings, but disclosure requirements have little impact on the influence of accounting quality on cash holdings.

The influence of the two aspects of enforcement is examined further by dividing AQ into IAQ and DAQ. In column (3), the relation between IAQ and cash holdings is not affected by public enforcement. On the other hand, DAQ is significantly affected by public enforcement. In column (4), private enforcement does not have a significant influence. These results imply that the information that affects a firm's cash holding policy is mainly in the discretionary accruals quality. In addition, the relation is affected mainly by public enforcement, but little by private enforcement.

The results are worth comparing with those of prior studies on the consequence of public and private enforcement. La Porta et al. (2006) find that private enforcement is related to the development of capital markets. Hail and Leuz (2006) report that both private enforcement and public enforcement affect the cost of capital. Unlike these prior studies, the results in Table 6 show that only public enforcement has a significant influence on the association between firm opacity and cash holdings.

Although private and public enforcement can conceptually be distinguished from each other, in reality, the two aspects are likely to be closely related. The interaction could strengthen or weaken the influence of each other. This possibility is examined by including both aspects in the same model. Column (5) and (6) present the results. The coefficients are qualitatively consistent with those in column (1) to (4), which implies that the interaction between the two aspects of enforcement does not significantly affect the main findings of Table 6.

Table 6
The Influence of Public Enforcement and Private Enforcement

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample					
AQ	-0.560 (-0.93)	-0.361 (-0.25)			0.060 (0.04)	
PUB×AQ	1.665** (1.98)				1.495* (1.75)	
PUB×AQ		-0.207 (-0.10)			-0.673 (-0.34)	
IAQ			1.416 (1.26)	2.547 (0.86)		1.621 (0.53)
PUB×IAQ			-1.673 (-1.12)			-2.115 (-1.40)
PRV×IAQ				-6.552 (-1.57)		0.286 (0.07)
DAQ			-1.123* (-1.78)	-1.007 (-0.65)		-0.216 (-0.14)
PUB×DAQ			2.587*** (2.84)			2.523*** (2.75)
PRV×DAQ				0.875 (0.40)		-1.184 (-0.56)
PUB	-0.815*** (-16.61)		-0.647*** (-7.84)		-0.819*** (-16.74)	-0.639*** (-7.76)
PRV		0.008 (0.05)		0.334 (1.29)	0.310* (1.75)	0.284 (1.08)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Ind. dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,947	16,947	16,947	16,947	16,947	16,947
Adj. R ²	0.293	0.258	0.293	0.258	0.293	0.294

Note: Dependent variable is the natural logarithm of cash & cash equivalents divided by net assets. AQ is the standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t. IAQ and DAQ are respectively the expected value and residuals of the regression of AQ on size, standard deviation of cash flows from operation, standard deviation of sales, operating cycle, and number of negative earnings from t-2 to t. CASH_UNADJ is cash & cash equivalent divided by net assets. CASH is the natural logarithm of CASH_UNADJ. PUB and PRV are measures for public enforcement and private enforcement suggested by Bushman and Piotroski (2006) and La Porta et al. (2006). SIZE is the natural logarithm of net assets in U.S. \$ million. NWC is total current assets less cash & cash equivalents and total current liabilities, divided by net assets. R&D is research and development expenses divided by sales. OCF is cash flows from operation divided by average total assets, if cash flows from operations are available. Otherwise, income before extraordinary less total accruals, which is calculated from balance sheet, scaled by average total assets are defined as OCF. Total accruals calculated from balance sheet is the change of total current assets and the change of short-term debt less the change of total current liabilities, the change of cash & cash equivalents, and depreciation expenses (Francis et al., 2005). LEV is long-term debt and short-term divided by total assets. ΔSALES is the change in sales divided by average total assets. σ (SALES) is the standard deviation of sales divided by average total assets from t-2 to t. P/B is the ratio of market value of equity to book value of equity. DIV is cash dividends divided by average total assets. CAPEX is Capital expenditure divided by average total assets. Final sample has 18,071 firm-year observations from 24 countries. Sample period is from 1990 to 2010. Standard errors are adjusted by firm cluster. *, **, *** indicate significance levels of 10%, 5%, 1%, respectively. Column (1) and (2) show the results using the strength of public enforcement as the proxy for investor protection. Column (3) and (4) present the results using the strength of private enforcement as the proxy for investor protection. Column (3) and (4) show the results of combined effect of both public and private enforcement in the same model.

7.2 Measurement Period of Accruals Quality

Our AQ measure uses a shorter measurement period than several prior studies. A shorter period gives several advantages: first, the sample size increases. Unlike U.S. or Korean data, international data is not comprehensive, and thus requiring consecutive observations over 5 years severely eliminates observations. This could worsen the sample selection bias.¹⁵⁾ Second, using a short measurement period makes the AQ measure timelier than that measured using longer periods, although measurement error issues could become more serious. Because of these reasons, this study measures AQ over 3 years including the current year. However, the robustness of test should be examined.

All the regression analyses in this study are reinvestigated by using AQ measured for five years from t-4 to current year. This sample has 8,888 observations, which is about a half of the size of main test of this study. Untabulated results of robustness tests are qualitatively identical to the results of main tests. The coefficients of variables of interests maintain their sign and significance. Therefore, one can conclude that the measurement period of AQ is an insignificant factor in this study.

VIII Conclusion

This study investigates the influence of financial reporting quality on cash holding policies using international data. The empirical test of this study finds a positive association between cash holdings and accruals quality, which is consistent with prior studies. Moreover, using an international setting, this study finds that the positive relation is prominent in strong investor protection regimes, especially where public re-

gulations are strong. These results show that the positive relation between cash holdings and financial reporting quality is mainly driven by precautionary motives and not by agency problem related motives. Further analyses show that cash holdings have a positive relation with the discretionary portion of accruals quality as well as innate accruals quality, indicating that discretionary accruals contain information related to financing decisions.

This study has several contributions to the literature. First, this study clarifies the reason why cash holdings increase with financial reporting opacity. Prior studies argue that the lack of monitoring drives agency problem related cash holdings in opaque firms. On the other hand, this study finds evidence that precautionary motives are the actual motivation for the relation between cash holding and financial reporting quality. Second, this study provides additional evidence that supports the importance of institutional aspects in financing and investing. As investor protection reduces the potential costs of agency problems and adverse selection, firms are allowed to hedge against operating risks by reserving precautionary cash holdings. Third, this paper also provides implications regarding the cash holdings of SMEs. SMEs generally have limited access to capital markets, which could lead SMEs to under investment problems. However, SMEs' opacity and weak monitoring by investors could cause the inefficient use of cash assets in unprofitable investment projects. By strengthening investor protection, the benefits of cash holdings to SMEs can be enhanced by reducing the agency problem regarding cash holdings. Lastly, this study shows the role of public enforcement in improving the efficiency of corporate financing policies. The most important caveat of this paper is that the focus is on the determination of the level of cash holding, whereas the consequences of cash holding policies in opaque firms are not examined. The consequences of cash holding in opaque firms should also be comprehen-

15) Although data providers argue that they cover most listed firms in the world, small firms are more likely to be excluded from the sample than larger firms.

sively examined across various aspects in future studies.

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[Appendix] Variable Definition

Name	Definition
AQ	Standard deviation of the residuals of Dechow and Dichev's (2002) model from t-2 to t
DAQ	Expected value of AQ estimated by the model of Francis et al. (2005)
IAQ	Residual value of AQ estimated by the model of Francis et al. (2005)
CL	1 if the country's law has a common law origin, 0 otherwise
ASD	Anti-self-dealing index according to Djankov et al. (2008)
PRV	Private enforcement index of Bushman and Priotoski (2006)
PUB	Public enforcement index of Bushman and Priotoski (2006) and La Porta et al. (2006)
NA	Net assets, total assets less cash & cash equivalents
CASH	The natural logarithm of (cash & cash equivalent/net assets)
CASH_UNADJ	cash & cash equivalent/net assets
SIZE	Natural logarithm of net assets in U.S. \$ million
NWC	Total current assets less cash & cash equivalents and total current liabilities, divided by net assets
R&D	R&D expense/sales
OCF	Cash flows from operation divided by average total assets, if cash flows from operations are available. Otherwise, income before extraordinary less total accruals, which is calculated from balance sheet, scaled by average total assets are defined as OCF. Total accruals calculated from balance sheet is the change of total current assets and the change of short-term debt less the change of total current liabilities, the change of cash & cash equivalents, and depreciation expenses (Francis et al., 2005)
LEV	Long-term debt and short-term divided by total assets
σ (SALES)	Standard deviation of sales divided by average total assets from t-2 to t
Δ SALES	Change in sales divided by average total assets
P/B	Market value of equity/book value of equity
DIV	cash dividends divided by average total assets
CAPEX	Capital expenditure divided by average total assets
Ind_dummy	Dummy variable for Fama-French 48 industry classification
Year_dummy	Year dummy variable
TCA	Total current accruals, the change of (total current assets and short-term debt less total current liabilities cash & cash equivalents)
PPE	Gross value of property, plant, and equipment scaled by average total assets
σ (CFO)	standard deviation of cash flow from operations from t-2 to t
σ (Sales)	standard deviation of SALES from t-2 to t
OperCycle	Operating cycle, the sum of days accounts receivable and days inventory
NegEarn	Sum of the numbers of years reported negative earnings for t-2 to t

불투명한 기업은 자산유동성을 선호하는가?

임상균*

본 연구에서는 세계 각국의 자료를 이용하여 현금보유와 발생액의 질로 측정된 재무보고의 질의 관계를 연구하였다. 본 연구의 실증분석결과는 미국을 제외한 세계 각국의 시장에서 현금보유가 재무보고의 불투명성과 양의 상관관계가 있음을 발견하였다. 이러한 관계는 투자자보호가 강해짐에 따라 더욱 강하게 나타났는데, 이것은 대리인 동기가 아닌 예방적 동기가 불투명한 기업의 현금보유의 주요 결정요인임을 보여준다. 이러한 양의 상관관계는 재량적 발생액의 질에서 뚜렷하게 나타났다. 투자자보호를 그 속성별로 나누어 본 결과는 규제기관을 통한 투자자보호가 기업 재무보고의 불투명성과 현금보유 사이의 양의 관계를 강화하는 것으로 나타났다.

주제어 : 현금보유, 발생액의 질, 투자자보호

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