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Charoenwong, C., Chong, B. S., & Yang, Y. C. (2014). Asset Liquidity and Stock Liquidity: International Evidence. *Journal of Business Finance & Accounting*, *41*(3-4), 435- 468. https://doi.org/10.1111/jbfa.12052

Published in:
Journal of Business Finance & Accounting

Document Version:
Early version, also known as pre-print

Journal of Business Finance & Accounting, forthcoming

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October 2013

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We would like to especially thank Martin Walker (the editor) for his effort to improve the original manuscript both in content and exposition. We are also grateful for comments of an anonymous referee and the seminar participants at the 2013 JBFA Capital Markets Conference, 2012 AAA Annual Meeting, Nanyang Technological University, and Queen's University Belfast.

Asset Liquidity and Stock Liquidity: International Evidence

Abstract

This study examines the relation between asset liquidity and stock liquidity across 47 countries. In support of the *valuation uncertainty* hypothesis, we find that firms with greater asset liquidity on average have higher stock liquidity. More importantly, our study shows that asset liquidity plays a more significant role in resolving *valuation uncertainty* in countries with poor information environment. For example, we find that the asset-stock liquidity relation is stronger in countries with poor accounting standards. We further find some evidence that after the adoption of IFRS, the improved accounting information environment results in a weaker asset-stock liquidity relation, but only in countries with a strong legal regime. Finally, our study shows that the positive asset-stock liquidity relation may be attributed to transparency and/or liquidity reasons.

JEL Classification: G12, G14, G15, G32, M41, M48, F30

Keywords: Stock Liquidity, Asset Liquidity, IFRS, Transparency, Cash Holdings

1. Introduction

We study two important issues relating to the asset liquidity and stock liquidity relation. First, in an international setting, we examine the asset liquidity and stock liquidity relation under different accounting information environments. Then, we examine both the transparency and liquidity effects associated with the asset liquidity and stock liquidity relation.

Gopalan et al. (2012) present two competing hypotheses for the relation between asset liquidity and stock liquidity. The *valuation uncertainty* hypothesis predicts a positive relation between asset liquidity and stock liquidity, while the *utilization uncertainty* hypothesis predicts a negative relation. Under the *valuation uncertainty* hypothesis, liquid assets are easier to value than non-liquid assets. Firms with greater asset liquidity are associated with lower *valuation uncertainty* and, therefore, have higher stock liquidity. Under the *utilization uncertainty* hypothesis, higher cash holdings imply more investments and hence greater uncertainty over the value of future assets. Moreover, there is also a danger that the cash may be invested in negative NPV projects or expropriated by managers due to agency problems. Thus, firms holding higher cash and other liquid assets have higher *utilization uncertainty* and will have lower stock liquidity. The actual relation between asset liquidity and stock liquidity is an empirical issue. While Gopalan et al. (2012) find a positive relation between asset liquidity and stock liquidity in the U.S. equity market, our study tests the above competing (but not mutually exclusive) hypotheses in an international setting, which allows for additional insights not explicitly covered in their model. We find a positive relation between asset liquidity and stock liquidity across international capital markets. We attempt to provide further insights on the *valuation uncertainty* hypothesis by examining the asset and stock liquidity relation under different accounting information environments. Lang et al. (2012) argue that firm-level transparency matters more in

countries with greater overall information opacity, i.e., where the demand for information is greater. From an asset transparency perspective, cash and other liquid assets are less opaque and easier to value than other assets because of lower information asymmetry (Aboody and Lev, 2000; Kothari et al., 2002). Firm-level transparency is therefore higher for firms with greater asset liquidity. Investors are more reliant on the firm's asset liquidity (transparency) to value the firm in the face of weaker accounting standards.[1] In other words, the *valuation uncertainty* hypothesis posits a stronger asset-stock liquidity relation in countries with weak accounting standards. In contrast, the *utilization uncertainty* hypothesis posits a weaker asset-stock liquidity relation in countries with weak accounting standards. In a more opaque information environment, an entrenched manager can easily abuse the firms' cash holdings and result in higher *utilization uncertainty* for the firm's cash holdings.

In support of the *valuation uncertainty* hypothesis, we find that the asset-stock liquidity relation is stronger in countries with poor accounting standards. This finding indicates that firm-level asset liquidity (transparency) plays a more prominent role in resolving the *valuation uncertainty* when the accounting information environment is poor. We examine the asset and stock liquidity relation across 47 countries around the world. The sample consists of 16,370 unique firms and covers the period of 1996 to 2010, resulting in 127,982 firm-year observations. The dependent variable in our multivariate regressions is stock liquidity. We employ the Zero Proportion[2] of Lesmond et al. (1999) and define our stock liquidity measure as (1 – Zero Proportion).

[1] Durnev and Kim (2005) and Klapper and Love (2004), similarly, argue that firm-level corporate governance provisions play a more important role in alleviating the negative effects of ineffective legal framework when regulation is weak.

[2] The Zero Proportion of a stock is a measure of illiquidity which is equal to the proportion of trading days with zero returns to total trading days in a given year.

The primary independent variable of interest is asset liquidity. Our measures of asset liquidity are similar to those in Gopalan et al. (2012). To construct the asset liquidity measures, we first rank a firm's assets based on their degree of liquidity and assign a liquidity score between zero and one to each asset class. We then compute a weighted average of the liquidity scores across the different asset classes for each firm. The weights are based on the proportion of each asset class scaled by the lagged value of total assets. Depending on the liquidity scores assigned to each asset class in the initial step, this methodology yields three alternative measures of asset liquidity for each firm.

In a separate analysis, we examine the effects of a change of accounting information environment on the asset and stock liquidity relation. We investigate the structural changes in the asset-stock liquidity relation around the mandatory adoption of International Financial Reporting Standards (IFRS) across the 47 countries. A number of studies (Daske et al., 2008; Byard et al., 2011; Horton et al., 2013; Tan et al. 2011) conclude that the adoption of IFRS improves the information environment and produced positive market-based benefits, such as higher stock liquidity. However, a more recent study (Christensen et al., 2013a) finds that the liquidity benefits around the introduction of IFRS are mostly attributed to changes in the reporting enforcement, rather than the change in accounting standards per se[3]. Nevertheless, what is important in this study is that both events surrounding the adoption of IFRS lead to an improvement in the accounting information environment.

Using the adoption of IFRS as an exogenous context, we test the effect of information environments on the asset-stock liquidity relation. Under the *valuation uncertainty* hypothesis, we expect the asset-stock liquidity relation to be weaker following the adoption of IFRS.

[3] We conduct a test using the five EU countries that made substantive changes in enforcement concurrent with the introduction of IFRS (Christensen et al., 2013a). The result is qualitatively similar but less significant compare to those countries with strong legal regime.

Following Lang et al.'s (2012) argument, the improved accounting information environment in the post-IFRS period reduces the importance of firm-level asset liquidity (transparency). The higher quality of information disclosure following the IFRS should prompt investors to rely less on asset liquidity (transparency) in firm valuation. In contrast, the asset-stock liquidity relation is expected to be stronger post-IFRS under the *utilization uncertainty* hypothesis. An improved information environment reduces asymmetric information and makes it harder for managers to abuse the firm's cash holdings. In support of the *valuation uncertainty* hypothesis, we find some evidence that the improved accounting information environment in the post-IFRS period results in a weaker asset-stock liquidity relation, but the weaker asset-stock liquidity relation occurs only in countries with a strong legal regime. This finding suggests that the quality of the information environment depend on the quality of enforcement of those standards.

To check the robustness of our results, we further examine the asset and stock liquidity relation under different legal regimes. Contrary to the *utilization uncertainty* hypothesis, the asset-stock liquidity relation is stronger in countries with a weak legal regime. We also use the bid-ask spread as an alternative measure of liquidity. The asset-stock liquidity relation is inconclusive when using the bid-ask spread. One possible reason for this result may be because of the reduction in sample size. In comparison to our original sample size of 127,982, the number of firm-year observations for the bid-ask spread sample drops to 91,251. In fact, two countries entirely drop out from the sample due to data limitations. Another possible reason is that the Zero Proportion may be better than the bid-ask spread for studying stock liquidity, especially in international capital markets. Studies supporting this argument consist of Lesmond et al. (1999), Lesmond (2005), and Bekaert et al. (2007), which conclude that the Zero Proportion is better at capturing priced liquidity than a variety of other measures. Lang et al. (2012) also support the

argument, stating that "the bid-ask spreads speak more directly to transaction costs, while zero-return days measure liquidity more directly and are available for a wider sample of firms."

Finally, we examine the transparency and liquidity effects on the asset-stock liquidity relation. The positive asset-stock liquidity relation may be attributed to two possible effects. First, liquid assets, such as cash, are more transparent than others. They are easier to value because they have less information asymmetry. Therefore, firms with a higher proportion of cash and other liquid assets are more transparent and would have higher stock liquidity. Second, the positive relation between asset liquidity and stock liquidity may be due to a liquidity effect. Higher asset liquidity reduces the firm's operating risks and investment uncertainty. Firms with higher asset liquidity are expected to have lower *valuation uncertainty* and hence higher stock liquidity.

To study the transparency and liquidity effects associated with the positive asset-stock liquidity relation, we examine the effect of individual balance sheet (Cash, Current Assets, Fixed Asset, and Intangible Assets) items on stock liquidity. We find that stock liquidity is positively related to both the firm's cash holdings and intangible assets. The positive relation between cash holdings and stock liquidity may be due to transparency and/or liquidity reasons. Cash and its equivalents are both significantly less opaque and more liquid than other assets. In contrast, intangible assets are relatively illiquid. Although intangible assets are more difficult to value than other assets, the accounting recognition and disclosure of such assets actually enhance the transparency of firms. Thus, any significant relation that intangible assets have with stock liquidity is largely attributed to transparency reasons rather than liquidity reasons. We also find a significant positive relation between non-cash current assets and stock liquidity. There is no statistically significant relation between fixed assets and stock liquidity.

To further distinguish the transparency effect from the liquidity effect, we also examine the respective balance sheet item's relation with stock liquidity under different accounting information environments and under financially constrained firms. The cash-stock liquidity relation is significantly stronger firms in countries with weak accounting standards or those with financial constraints. In contrast, the intangible assets-stock liquidity relation is only stronger in countries with weak accounting standards. Our findings suggest that the both transparency and liquidity effects drive the cash-stock liquidity relation; while only the transparency effect drives the intangible assets-stock liquidity relation. The findings for the non-cash current assets and stock liquidity relation and the fixed assets and stock liquidity relation under the above two settings are mixed and inconclusive.

This paper contributes to the study on the link between a firm's physical assets structure and its market microstructure. First, extending upon Gopalan et al.'s (2012) empirical findings in the U.S., we provide international evidence on the positive relation between asset liquidity and stock liquidity across 47 countries. Moreover, we examine the asset liquidity and stock liquidity relation under different accounting information and legal environments. We provide important insights on the role that cash and other liquid assets play in resolving *valuation uncertainty* and find that investors rely more on a firm's asset liquidity to value the firm in countries with poor accounting information environment. In the other words, the link between asset liquidity and stock liquidity weakens with the improvement in accounting standards. Overall, our findings indicate that the accounting information environment is an important determinant of the asset-stock liquidity relation.

Second, our study is related to previous studies (Healy et al., 1999; Lang et al., 2012; Leuz and Verrecchia, 2000; Welker, 1995) on the relation between firm transparency and stock

liquidity. Lang et al. (2012) find a positive relation between firm transparency (as measured by earnings management, accounting standards, auditor quality, number of analyst following, and accuracy of analyst forecasts) and stock liquidity across 46 countries. Other studies (Healy et al., 1999; Leuz and Verrecchia, 2000; Welker, 1995) find that better firm disclosures lead to higher stock liquidity. However, the firm's overall transparency also depends on the transparency of its asset structure. Thus, unlike previous studies, our study focuses on the direct relation between asset transparency and stock liquidity.

More importantly, our study also differs from previous studies on firm transparency because the relation between asset liquidity and stock liquidity may not be attributable to the transparency reason alone. There is a liquidity effect as well. For example, our study shows that the cash-stock liquidity relation is driven by both transparency and liquidity effects; while the intangible assets-stock liquidity relation is driven by transparency effect only.

The remainder of the paper is organized as follows. Section 2 develops the testable hypotheses. Section 3 describes the data and sample selection. Section 4 provides international evidence on the relation between asset liquidity and stock liquidity. Section 5 examines the asset-stock liquidity relation under different accounting information environments. We conduct further robustness checks in Section 6. Section 7 examines individual balance sheet (Cash, Current Assets, Fixed Asset, and Intangible Assets) item's relation with stock liquidity. Section 8 concludes the study.

2. Hypotheses Development

In this study, we examine the following competing hypotheses on the relation between asset liquidity and stock liquidity:

$H1_0$: The stock liquidity of a firm is *positively* correlated to its asset liquidity (*Valuation Uncertainty Hypothesis*).

$H1_a$: The stock liquidity of a firm is *negatively* correlated to its asset liquidity (*Utilization Uncertainty Hypothesis*).

In Gopalan et al.'s (2012) model, the firm's assets comprise cash, an existing illiquid project, and a growth option (new project). Hence, the key parameters that affect the overall variance of a firm's value are the proportion of cash holdings (α), variance of current project's cash flows (ε_x), and variance of new project's cash flows (ε_y). The managerial cash holdings and investment decisions then affect the volatility of firm value and, consequently, stock illiquidity as measured by Kyle's lambda.

Under the *valuation uncertainty* hypothesis, there are two reasons why liquid assets, such as cash, are positively associated with stock liquidity. First, from an asset transparency perspective, cash and other liquid assets are easier to value than other assets because of lower information asymmetry (Aboody and Lev, 2000; Kothari et al., 2002). In Gopalan et al.'s (2012) model, higher cash holdings are associated with lower volatility in the value of assets-in-place. Firms with a higher proportion of cash and other liquid assets are more transparent and, therefore, associated with higher stock liquidity.[4] Second, the positive relation between asset liquidity and stock liquidity may also be due to a liquidity reason. Asset liquidity reduces the operating risks and the investment uncertainty of a firm (Opler et al., 1999; Bates et al., 2009). For example, high cash holdings can help firms to avoid disruptions in operating activities that arise from

[4] The link between firm transparency and stock liquidity is also related to previous studies on firm disclosure policy (Glosten and Milgrom, 1985; Kyle, 1985; Healy et al., 1999; Lang et al., 2012; Leuz and Verrecchia, 2000; Welker, 1995). For example, Welker (1995), Healy et al. (1999), and Leuz and Verrecchia (2000) find that better firm disclosure, which reduces information asymmetry between insiders and the public, leads to narrower bid-ask spread (higher stock liquidity). The firm's overall transparency is not attributable to the firm's disclosure policy per se, but it is also dependent on the transparency of the firm's asset structure. Liquid assets, such as cash and its equivalents, are less opaque than other assets.

shortfalls in sales and cash flows. High cash holdings also provide greater certainty on the funding and implementation of planned fixed asset investments. Thus, a benefit associated with higher asset liquidity is lower volatility in current project's cash flows (ε_x).[5] As a consequence, firms with a higher level of asset liquidity are expected to have lower *valuation uncertainty* and, hence, higher stock liquidity. Overall, both asset transparency and liquidity effects posit a positive relation between asset liquidity and stock liquidity.

In contrast, the *utilization uncertainty* hypothesis predicts a negative relationship between asset and stock liquidity. The *utilization uncertainty* hypothesis focuses on the uncertainty pertaining to the usage and redeployment of liquid assets. Myers and Rajan (1998) argue that a downside to liquid assets is that cash and other liquid assets can be easily redeployed or even expropriated. In Gopalan et al.'s (2012) model, higher cash holdings also imply more investments. The firm has greater uncertainty over future assets and, therefore, will have lower stock liquidity. There is thus a danger that the cash may be invested in negative NPV projects or expropriated through outright theft. The availability of excess cash also facilitates share repurchases, which can be potentially abused by managers with stock options to artificially drive up share prices. Lazonick (2008) documents some of the recent abuses of share repurchases by managers.[6]

In this study, we start by testing the two competing hypotheses. We do so by examining the relation between asset liquidity and stock liquidity across 47 countries. We also examine the relation between asset and stock liquidity under different accounting information environments. First, we examine the effect of cross-country variations in accounting standards on the asset and

[5] Gopalan et al. (2012) did not explicitly model the liquidity effect associated with a firm's cash holdings per se. In their model, the variance of current project's cash flows (ε_x) is assumed to be exogenous and independent of the firm's cash holdings.

[6] Lazonick, William, September 25, 2008, "Everyone is Paying Price for Share Buybacks," *Financial Times*.

stock liquidity relation. Countries with weak accounting standards are generally associated with poor accounting information environment and also greater information asymmetry (Bushman et al., 2004). Gopalan et al. (2012) do not explicitly model the asset-stock liquidity relation under different accounting information environments, but Durnev and Kim (2005) and Klapper and Love (2004) argue that firm-level corporate governance matters more in countries with a weak legal regime. Similarly, Lang et al. (2012) argue that firm-level transparency matters more in countries with greater overall information opacity, where the demand for information is greater. From an asset transparency perspective, cash and other liquid assets are more transparent and easier to value than other assets. Firm-level transparency is therefore higher for firms with greater asset liquidity. Investors are more reliant on the firm's asset liquidity (transparency) structure to value the firm in countries with weak accounting standards. In the other words, the *valuation uncertainty* hypothesis posits a stronger asset-stock liquidity relation in countries with weak accounting standards.

In contrast, the *utilization uncertainty* hypothesis posits a weaker asset-stock liquidity relation in countries with lower accounting standards. A more opaque information environment is likely to enhance the entrenched manager's ability to abuse the firms' cash holdings. Agency problems are more serious in countries with weak accounting standards as the manager's sub-optimal and expropriation activities are less likely to be detected. The effect of different accounting standards on the asset-stock liquidity relation is summarized below:

$H2_0$: The relation between asset liquidity and stock liquidity is stronger in countries with weak accounting standards (*Valuation Uncertainty Hypothesis*).

$H2_a$: The relation between asset liquidity and stock liquidity is weaker in countries with weak accounting standards (*Utilization Uncertainty Hypothesis*).

Second, we examine the structural changes in the asset-stock liquidity relation around the mandatory adoption of IFRS across 47 countries. The adoption of IFRS around the world is probably one of the most important regulatory changes recently. IFRS is a set of uniform accounting and disclosure rules for corporate financial reporting that is developed by the International Accounting Standards Board (IASB). The potential benefits from the adoption of IFRS include improved information comparability, increased reporting transparency, reduced information costs, and lessened information asymmetry (Ball, 2006; Choi and Meek, 2010). Some studies have shown that the adoption of IFRS resulted in an improvement in the information environment and produced positive market-based benefits such as higher stock liquidity, lower cost of capital, and greater analyst forecast accuracy (Byard et al., 2011; Daske et al., 2008; Horton et al., 2013). A more recent study by Christensen et al. (2013a), however, argues that the liquidity benefits around the introduction of IFRS are attributed mostly to changes in reporting enforcement, rather than the change in accounting standards per se. Regardless of the reasons behind the liquidity benefits, both the events surrounding the adoption of IFRS lead to an improvement in accounting information environment.

The events surrounding the mandatory adoption of IFRS thus represents an ideal exogenous context for us to study the effect that an improvement in accounting information environment has on the asset-stock liquidity relation. Following Lang et al.'s (2012) argument, the improved accounting information environment in the post-IFRS period is expected to reduce the importance of firm-level asset liquidity (transparency). As a consequence, investors are expected to rely less on the firm's asset liquidity structure to resolve *valuation uncertainty* after the adoption of IFRS. In contrast, the asset-stock liquidity relation is expected to be stronger in the post-IFRS period under the *utilization uncertainty* hypothesis. Thus, the improved

information environment post-IFRS makes it harder for managers to abuse the firms' cash holdings and, hence, result in lower *utilization uncertainty* for the firm's cash holdings. The possible effects associated with the mandatory adoption of IFRS are summarized below:

$H3_0$: The relation between asset liquidity and stock liquidity is weaker post-IFRS (*Valuation Uncertainty Hypothesis*).

$H3_a$: The relation between asset liquidity and stock liquidity is stronger post-IFRS (*Utilization Uncertainty Hypothesis*).

Previous studies have shown that the implementation of IFRS and the quality of financial reports after the IFRS adoption depend on the countries' legal regimes. As argued in Daske et al. (2013), countries with a strong legal regime are likely to be "serious" adopters of IFRS, while countries with a weak legal regime are likely to adopt IFRS in label only. A more recent study by Christensen et al.'s (2013a) find that the liquidity benefits are limited mostly to five EU countries that made substantive changes in reporting enforcement concurrently with the introduction of IFRS. Hence, the liquidity effects in the post-IFRS period may be contingent on the countries' legal regimes. We test these effects in our international sample.

3. Sample and Data

This section describes the sample, the data, and the measures of stock liquidity and asset liquidity. A summary of the variables description and the data sources are provided in the Appendix.

3.1 Sample

Our sample selection is based on the following procedures. We select firms from countries that are covered by both Datastream and Worldscope over the period of 1996 to 2010. To be included in the sample, the firms are required to have market and accounting information necessary for the computation of both the liquidity and control variables. Except for China and the U.S., we select the stocks from the major exchange of each country.[7] We only include non-financial primary-listing common stocks that are traded using the same currency as that of the listing country. Depository Receipts, Real Estate Investment Trusts (REIT), and preferred stocks are excluded from our sample. We remove non-common stocks that are wrongly labeled as common stocks by Datastream, using a comprehensive "name screening" list compiled by Griffin et al. (2009). Finally, we exclude penny stocks that are priced less than US$0.50 per share.[8] The final sample consists of 127,982 firm-year observations for 16,370 unique firms across 47 countries.

3.2 Stock Liquidity (*LIQ*)

As documented in Lesmond et al. (1999), a common problem associated with the bid-ask spread measure for stock liquidity in studies on international capital markets is that the time-series data on the bid-ask spread in international markets is either incomplete or of insufficient length. To mitigate the data availability problem for international markets, Lesmond et al. (1999) propose a stock illiquidity measure derived from daily stock returns. The stock illiquidity measure, called the Zero Proportion, is the proportion of trading days with zero returns to total trading days in a given year. The intuition is that arbitrageurs trade only if the value of accumulated information exceeds the marginal cost of trading. If trading costs are sizable, new

[7] Most countries have only one major exchange, except for the U.S. (NYSE, AMEX, NASDAQ) and China (Shanghai Stock Exchange, Shenzhen Stock Exchange).
[8] We also obtain similar results using US$1 per share as an alternate cut-off for filtering penny stocks.

information must accumulate for a period of time before investors engage in trading. Lesmond (2005) concludes that the Zero Proportion measure performs well in both within-country cross-sectional and cross-country analyses. The Zero Proportion measure has also been validated in both the U.S. and international markets (Bekaert et al., 2007; Goyenko et al., 2009; Lesmond, 2005). Since Zero Proportion is a measure of illiquidity, we take its complement expressed by Equation (1) as the measure of stock liquidity (*LIQ*) for our study.

$$LIQ_i = [1 - Zero\ Proportion_i] \times 100 \quad (1)$$

The stock return data for calculating the stock liquidity (*LIQ*) measure is from Datastream. However, Ince and Porter (2006) caution about a possible data error in Datastream's return index. To rectify the data error, we follow Ince and Porter's (2006) recommendation and set the daily return index to be missing if any returns above 100% are reversed the next day, and set the monthly return index to be missing if any of the returns above 300% are reversed the following month.[9] Another data problem is that Datastream fills the return index with the previous day's data if the stock is either delisted or not traded. This practice produces erroneous zero returns after delisting dates and on non-trading days. To rectify this problem, we first follow Ince and Porter's (2006) methodology for identifying delisted firms and their delisting dates. To identify the delisting date, we observe the most recent dates that produce non-zero return in reverse chronological order. The latest non-zero return date is treated as the delisting date. Second, following Lesmond et al.'s (1999) methodology, we classify non-trading dates for a specific exchange if 90% or more of the stocks have zero return on that date. Finally, all

[9] Returns are calculated from Datastream's Return Index (RI) data type using the following relation: $r_{j,t} = (RI_{j,t} / RI_{t,t-1}) - 1$. Datastream's RI assumes dividend reinvestment.

observations recorded on non-trading dates and after delisting dates are deleted to rectify the erroneous zero returns problem.

The summary statistics for the stock liquidity (*LIQ*) measure are shown in Table 1. Overall, the mean and median stock liquidity (*LIQ*) for our sample are 82.3 and 92.7, respectively. On average, firms in the U.S., India, China, Italy, and South Korea have the highest stock liquidity while those in Sri Lanka, Chile, Indonesia, and Philippines have the lowest stock liquidity.

[Insert Table 1 here]

3.3 Asset Liquidity

The main independent variable in our study is the asset liquidity measure. We follow Gopalan et al.'s (2012) methodology.[10] For a given firm, we rank its asset classes based on their varying degree of liquidity and assign a liquidity score between zero and one to each of them. Second, we calculate a weighted average of the liquidity scores across the different asset classes for each firm. Depending on the liquidity scores assigned to each asset class in the first step, this methodology yields three alternative measures of weighted asset liquidity (*WAL*) score for each firm.

For example, to compute the first measure of weighted asset liquidity (*WAL1*), we first assign a liquidity score of one to cash and cash equivalents[11], and a score of zero to all other assets. We then calculate *WAL1* as follows:

[10] This approach in measuring asset liquidity is in the same spirit as that of Berger and Bouwman (2009).
[11] We recognize that there are differences in liquidity among the different type of cash held by a firm. For example, cash in the bank account is more liquid than investment in short-term government bonds. Furthermore, it is possible that a multinational firm keeps its cash offshore for tax purpose. The cash kept offshore has low liquidity compared

$$WAL1_{i,t} = \frac{Cash\ \&\ Equivalents_{i,t}}{Total\ Assets_{i,t-1}} \times 1 + \frac{Other\ Assets_{i,t}}{Total\ Assets_{i,t-1}} \times 0 \quad (2)$$

The *WAL1* measure is crude and assumes that assets other than cash have no liquidity. For the second weighted asset liquidity (*WAL2*) measure, we assign a liquidity score of one to cash and cash equivalents and 0.5 to non-cash current assets because non-cash current assets are the second most liquid assets after cash. All other assets are assigned a score of zero. We calculate *WAL2* as follows:

$$WAL2_{i,t} = \frac{Cash\ \&\ Equivalents_{i,t}}{Total\ Assets_{i,t-1}} \times 1 + \frac{Non{-}Cash\ CA_{i,t}}{Total\ Assets_{i,t-1}} \times 0.5 + \frac{Other\ Assets_{i,t}}{Total\ Assets_{i,t-1}} \times 0 \quad (3)$$

The third weighted asset liquidity (*WAL3*) measure looks further into long-lived assets. Long-lived assets can be classified into tangible and non-tangible assets. Tangible assets (such as property, plant, and equipment) are more liquid than non-tangible assets (such as goodwill). Following this liquidity hierarchy, we assign a liquidity score of one to cash and cash equivalents, 0.75 to non-cash current assets, 0.5 to tangible fixed assets, and zero to non-tangible assets. We then compute *WAL3* as follows:

$$WAL3_{i,t} = \frac{Cash\ \&\ Equivalents_{i,t}}{Total\ Assets_{i,t-1}} \times 1 + \frac{Non - Cash\ CA_{i,t}}{Total\ Assets_{i,t-1}} \times 0.75 + \frac{Tangible\ FA_{i,t}}{Total\ Assets_{i,t-1}} \times 0.5 + \frac{Other\ Assets_{i,t}}{Total\ Assets_{i,t-1}} \times 0 \quad (4)$$

The summary statistics for the above three asset liquidity measures are shown in Table 1. In terms of asset liquidity ranking, we find that, on average, firms in U.S., Ireland, Taiwan, Singapore, and Norway have the highest asset liquidity while those in the Portugal, New Zealand, Russia, and Argentina have the lowest high asset liquidity. The mean (median) *WAL1*, *WAL2*,

to cash held in the domestic bank account. Nevertheless, the overall asset liquidity for cash is higher than the overall asset liquidity for current assets and fixed assets.

and *WAL3* across all countries are 0.176 (0.110), 0.366 (0.331), and 0.640 (0.614), respectively. All three asset liquidity measures have slightly positively skewed distribution. The three asset liquidity measures are also highly correlated, according to the correlation matrix in Table 3.

3.4 Firm-Level Independent Variables

Following Stoll (2000), we control for some firm-level variables in our study. We use the log of total market capitalization in U.S. dollars (*MV*) to control for the size effect, the log of stock price in U.S. dollars (*PRICE*) to control for the discrete tick size effect, book-to-market equity ratio (*BM*) and capital expenditure deflated by lagged total assets (*CAPEX*) to control for growth firms effect, and debt to total assets ratio (*LEVERAGE*) to control for the firm's financial leverage. *LEVERAGE* also acts as a proxy for the additional information generated by debtholders' monitoring activities and disclosure requirement (Leftwich, 1981). The Sloan's (1996) normalized accrual measure (*ACCRUAL*), a proxy for information asymmetry associated with a firm's earnings, is added to control for differences in the quality of a firm's earnings. We employ return on assets (*ROA*) and annual buy and hold abnormal return during the previous year (*BHAR*) to control for the firm's operating performance and stock return performance, respectively. Finally, we include return volatility (*RETVOL*), which is the standard deviation of the monthly stock return over the preceding twelve months, to control for the risk of adverse price changes on the specialist's stock inventory. Table 2 presents the descriptive statistics for the firm-level independent variables. Data for the variables are drawn from Datastream and Worldscope.

[Insert Table 2 here]

3.5 Country-Level Institutional Factors

Table 2 presents the country institutional factors that are used in the sub-sample analysis. First, to capture the cross-country variation in accounting information environment, we employ the accounting standards variable (*ACCSTD*), which is compiled by La Porta et al. (1998). The accounting standards variable is an index that rates the companies' annual reports based on the inclusion or omission of 90 accounting items under the categories of general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items. La Porta et al.'s (1998) accounting standards variable is designed as a measure of the level of accounting disclosure, not as a direct measure of reliability in accounting figures. The accounting standards variable acts as a proxy for cross-country variation in information asymmetry between the firms and their investors.

Second, to capture the cross-country variation in legal regimes, we classify a country's legal regime based its legal origin (*LAW*). La Porta et al. (1998) show that common-law countries (English legal origin) are associated with stronger investor protection and legal enforcement; while civil-law countries (French, German and Scandinavian legal origin) have weaker investor protection and legal enforcement. For robustness check, we also employ Djankov et al.'s (2008) anti-self-dealing index (*ANTI*) as an alternate measure of a country's legal regime. The anti-self-dealing index (*ANTI*) is a measure of shareholder protection that focuses on private enforcement mechanisms. *ANTI* is calculated from prevailing legal rules in 2003.

3.6 Pair-Wise Correlation Analysis

Table 3 presents the correlation matrix between all the variables. Consistent with the *valuation uncertainty* hypothesis, we find that the stock liquidity (*LIQ*) measure is positively correlated with all three asset liquidity measures, but the correlation coefficients are significant only for *WAL1* and *WAL2*. All three asset liquidity measures are highly correlated with each other.

[Insert Table 3 here]

Table 3 also indicates that the stock liquidity (*LIQ*) measure is positively correlated with *MV*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *ROA*, and *BHAR*. but negatively correlated with *BM* and *CAPEX*. Although not reported in Table 3, we find that the common-law variable and the anti-self-dealing index (*ANTI*) are highly correlated, with a coefficient of correlation of 0.735. In contrast, the accounting standards (*ACCSTD*) variable is only moderately correlated with legal origin and the anti-self-dealing index. The correlation coefficient for *ACCSTD* and common-law variable is 0.475 while the correlation coefficient for *ACCSTD* and anti-self-dealing index is 0.460.

4. International Evidence on Asset-Stock Liquidity Relation

The *valuation uncertainty* hypothesis predicts a positive relation between asset liquidity and stock liquidity, while the *utilization uncertainty* hypothesis predicts a negative relation. We employ the weighted asset liquidity (*WAL*) to study the asset-stock liquidity relationship and estimate the following equation:

$$LIQ_{i,t} = \alpha + \beta_1 WAL_{i,t} + \gamma_2 MV_{i,t-1} + \gamma_3 BM_{i,t-1} + \gamma_4 PRICE_{i,t-1} + \gamma_5 LEVERAGE_{i,t-1} + \gamma_6 ACCRUAL_{i,t-1} + \gamma_7 RETVOL_{i,t-1} + \gamma_8 CAPEX_{i,t-1} + \gamma_9 ROA_{i,t-1} + \gamma_{10} BHAR_{i,t-1} + Fixed\ Effect\ Dummies + \varepsilon_{i,t} \quad (5)$$

The dependent variable is the stock liquidity measure (*LIQ*). The variable of interest is *WAL*, which consists of three alternate definitions of the weighted asset liquidity measure specified in Section 3. The *valuation uncertainty* hypothesis predicts a positive β_1, while the *utilization uncertainty* hypothesis predicts a negative β_1. The firm-level independent variables, which are lagged by one year, are previously discussed in Section 3. In our multivariate regression analysis, we pool all the firm-year observations and estimate the above equation with two different sets of fixed effects. The first set of fixed effects consists of dummy variables that control for country, industry, and year effects. The second set of fixed effect consists of dummy variables for firm effect. The firm fixed effect controls for firm-level invariant factors such as corporate governance and disclosure policy.

[Insert Table 4 here]

The results of the multivariate regressions are presented in Table 4. Model 1, Model 3, and Model 5 of the regressions are estimated with firm fixed-effects while Model 2, Model 4, and Model 6 are estimated with country, industry, and year fixed-effects. In support of the *valuation uncertainty* hypothesis, we find strong international evidence of a positive relation between asset liquidity and stock liquidity. Table 4 shows that the coefficient estimates for all the *WAL* measures are positive and statistically significant. Economically, the coefficient estimate of 2.017 for *WAL1* under Model 1 indicates that for one standard deviation increase in *WAL1*, stock

liquidity or the proportion of non-zero return trading days increases by 0.42%.[12] The 0.42% improvement in stock liquidity is equivalent to about two-tenths of its standard deviation. The improvement in stock liquidity may appear low, but this result is not surprising because asset liquidity affects mostly the adverse selection component of stock liquidity, which only accounts for about 10% of the bid-ask spread of U.S. stocks (Huang and Stoll, 1997). The order processing cost and inventory cost components of stock liquidity are generally fixed costs in nature. Therefore, the 0.42% improvement in stock liquidity is actually considerable, given that this improvement stems predominantly from the reduction of the adverse selection component. The coefficient estimates for *WAL2* and *WAL3* also yield similar interpretation and conclusion. Overall, our results do not support the *utilization uncertainty* hypothesis, which predicts a negative asset-stock liquidity relation.

The coefficient estimates for the control variables are mostly within expectations. We find that larger firms are associated with better stock liquidity. This result is attributable to larger firms having lower information asymmetry, a bigger investor base, and larger outstanding shares. Stock liquidity is higher for value firms (high *BM*), which have less information asymmetry than growth firms (low *BM*). More profitable firms (high *ROA*) are associated with higher stock liquidity. Stock liquidity is positively related to accruals (*ACCRUAL*) and return volatility (*RETVOL*), but negatively related to the level of stock price (*PRICE*). The estimated coefficients for *LEVERAGE*, *CAPEX*, and *BHAR* are generally unstable; i.e. the sign of the estimated coefficients depends on the type of fixed effects included.

[12] One standard deviation increase in WAL1 is equal to 0.207. Hence, the change in stock liquidity (*LIQ*) is equal to $2.017 \times 0.207 = 0.42\%$.

5. Asset-Stock Liquidity Relation under Different Accounting Information Environments

In this section, we study the asset-stock liquidity relation under different accounting information environments. First, we examine the cross-sectional variation in the asset-stock liquidity relation across countries with different accounting standards. Second, we investigate the structural changes in the asset-stock liquidity relation around the mandatory adoption of IFRS across the 47 countries.

5.1 Sub-sample by Country's Accounting Standards

As a further test of the *valuation uncertainty* hypothesis, we now examine the asset-stock liquidity relation under different accounting standards. Under the *valuation uncertainty* hypothesis, the asset-stock liquidity relation is expected to be weaker in countries with good accounting standards, but stronger in countries with poor accounting standards. Also, as previously discussed in the hypothesis development section, different accounting standards do not have any predictable effects on the asset-stock liquidity relation under the *utilization uncertainty* hypothesis.

To examine the asset-stock liquidity relation under different accounting standards, we first partition our sample into two sub-samples according to the quality of the country's accounting standards. The High *ACCSTD* sub-sample consists of firms from countries with accounting standards index that is above the median while the Low *ACCSTD* sub-sample includes firms from countries with accounting standards index that is below the median. Second, we separately estimate the asset-stock liquidity relation for each of the above sub-samples.

Finally, we examine the differential asset-stock liquidity relation for the two sub-samples by comparing the estimated *WAL* coefficients for the two sub-samples.

[Insert Table 5 here]

Table 5 reports the results pertaining to the above sub-sample analysis. Again, in support of the *valuation uncertainty* hypothesis, we find that asset-stock liquidity relation is weaker in countries with higher accounting standards. The coefficient estimates for all three asset liquidity measures (*WAL1*-*WAL3*) are significantly lower in the High *ACCSTD* sub-sample than in the Low *ACCSTD* sub-sample. For example, the *WAL1* coefficient estimates for the High *ACCSTD* and Low *ACCSTD* sub-samples are equal to 0.935 and 6.031, respectively. A statistical test based on the *ΔWAL* Coefficient for *WAL1* further indicates that the *WAL1* coefficient estimates are significantly different between the two sub-samples. Intuitively, the *WAL1* finding indicates that the asset-stock liquidity relation is weaker in countries with higher accounting standards (High *ACCSTD* sub-sample) than in countries with lower accounting standards (Low *ACCSTD* sub-sample). The comparison of the *WAL2* and *WAL3* coefficient estimates across the two sub-samples also yields similar result and conclusion. Overall, the results tabulated in Table 5 do not support the *utilization uncertainty* hypothesis.

5.2 Impact of IFRS Adoption

In this section, we examine the structural changes in the asset-stock liquidity relation around the mandatory adoption of IFRS across 47 countries. As discussed previously in the hypothesis development section, the *valuation uncertainty* hypothesis posits a weaker asset-stock liquidity relation following the adoption of IFRS, but only in countries with strong legal regime. As a further test of the *valuation uncertainty* hypothesis, we first compare the asset-stock

liquidity relation before and after the mandatory adoption of IFRS across the entire sample. We then partition our sample according to the legal regimes and examine the structural change in the asset-stock liquidity relation for each sub-sample.

We first identify the IFRS adoption countries, which consist of all the countries having the mandatory adoption of IFRS in 2005. The non-IFRS adoption countries are those that retain their domestic accounting standards during the sample period of 1996-2007. Our identification of the IFRS adoption countries is primarily based on the country list and adoption dates compiled by Daske et al. (2008). Second, in accordance with Daske et al. (2013), we exclude firms that are coded as voluntary adopters of IFRS to avoid any confounding effects due to the incentives for such firms to voluntarily adopt IFRS prior to the mandated date. Also, to avoid a potential misclassification of the IFRS adoption by Worldscope (Daske et al., 2013), we remove firms that are located in an IFRS adoption country, but are coded as non-IFRS adopters. The firm-level reporting standards are obtained from Worldscope's Field item 07536. Finally, we pool all the firm-year observations associated with the IFRS adoption countries and estimate the following multivariate regression equation.

$$\begin{aligned} LIQ_{i,t} = {} & \alpha + \beta_1 WAL_{i,t} + \beta_2 POSTIFRS * WAL_{i,t} + \beta_3 POSTIFRS_{i,t} + \gamma_4 MV_{i,t-1} + \gamma_5 BM_{i,t-1} \\ & + \gamma_6 PRICE_{i,t-1} + \gamma_7 LEVERAGE_{i,t-1} + \gamma_8 ACCRUAL_{i,t-1} + \gamma_9 RETVOL_{i,t-1} \\ & + \gamma_{10} CAPEX_{i,t-1} + \gamma_{11} ROA_{i,t-1} + \gamma_{12} BHAR_{i,t-1} + Fixed\ Effect\ Dummies \\ & + \varepsilon_{i,t} \end{aligned} \quad (6)$$

In Equation (6), we add *POSTIFRS*, an indicator variable, which is set to 1 for firm-year observations after the IFRS adoption and 0 otherwise. We also include *POSTIFRS*WAL*, an interaction term, to capture the effect of the IFRS adoption on the asset-stock liquidity relation. The β_2 coefficient is thus a measure of the structural change in the asset-stock liquidity relation

post-IFRS. Under the *valuation uncertainty* hypothesis, the β_2 coefficient is expected to be negative.

[Insert Table 6 here]

We estimate Equation (6) for the sample of firms in the IFRS adoption countries and report the multivariate regression results in Panel A of Table 6. The tabulated results for the interaction variables are generally insignificant. We find that the estimated β_2 coefficients are not significantly different from zero for all the three measures of WAL. One reason for the insignificant finding may be attributed to the heterogeneous implementation of IFRS across different countries. Countries with a strong legal regime are likely to be "serious" adopters of IFRS while countries with a weak legal regime are likely to adopt IFRS in label only (Daske et al., 2008). To investigate the effects associated with the heterogeneous implementation of IFRS, we split our sample based on the country's legal origin. Alternatively, we also partition our sample based on Djankov et al.'s (2008) anti-self-dealing index (*ANTI*). We then estimate Equation (6) for each of the above sub-samples.

[Insert Table 7 here]

Table 7 reports the results of our sub-sample analysis by legal regimes. In Panel A, the sample is split based on legal origins. Common-law countries provide stronger investor protection and better legal enforcement than civil-law countries (La Porta et al., 1998). In Panel B, the sample is split based on Djankov et al.'s (2008) anti-self-dealing index (*ANTI*). The High and Low *ANTI* sub-samples consist of firms from countries with anti-self-dealing index that are above and below the median of *ANTI*, respectively.

Consistent with Daske et al.'s (2008) hypothesis on the heterogeneous implementation of IFRS, we find some evidence of a weaker asset-stock liquidity relation following the mandatory adoption of IFRS, but only in countries with a strong legal regime (Common Law and High *ANTI* sub-samples). In countries with a strong legal regime, the β_2 coefficient estimate for the *POSTIFRS*WAL* interaction term is significantly negative when *WAL1* is used as the measure of asset liquidity. The negative β_2 coefficient estimate, which indicates a structural decline in the asset-stock liquidity relation after the IFRS adoption, is consistent with the prediction of the *valuation uncertainty* hypothesis. The β_2 coefficient estimates for the *POSTIFRS*WAL* interaction term are negative, but not significantly different from zero when *WAL2* and *WAL3* are used as the measures of asset liquidity.

In countries with a weak legal regime (Civil Law and Low *ANTI* sub-samples), we do not observe any significant decline in the asset-stock liquidity relation. The β_2 coefficient estimates for the *POSTIFRS*WAL* interaction term are not significantly different from zero for all the three measures of asset liquidity (*WAL1*-*WAL3*). In summary, as predicted by the *valuation uncertainty* hypothesis, we find some evidence indicating that the improved accounting information environment in the post-IFRS period results in a weaker asset-stock liquidity relation, but the decline in the sensitivity of asset-stock liquidity relation is applicable to countries with a strong legal regime only.

For robustness, we also pool the observations from the IFRS adoption and non-adoption countries together and run a three-way interaction regression model for the combined sample to examine the interactive effects associated with WAL, post-IFRS, and IFRS adopting countries. Overall, we find the same interactive effect for the combined sample, i.e., the WAL coefficient estimate for the IFRS adoption countries declined significantly in the post-IFRS period, but only

in countries with a strong legal regime. The only difference between the combined sample and the IFRS adoption countries sub-sample regression results is the estimated post-IFRS WAL coefficient. The estimated post-IFRS WAL coefficient is significantly positive for the IFRS adoption countries sub-sample regression, but is negative for the combined sample regression.

Using the domestic GAAP-IFRS difference measure from Bae et al. (2008), we compare the effect of IFRS on the asset-stock liquidity relation conditional on the domestic GAAP-IFRS difference. We do not find the distance to IFRS standards is able to explain the cross-country changes in asset-stock liquidity relation after the IFRS adoption. It is likely that the IFRS adoption improves the accounting information environment, and the improvement is conditional on the country's legal regime rather than the distance to IFRS standards.

6. Robustness

First, as a further test of the *utilization uncertainty* hypothesis, we examine the asset-stock liquidity relation under different legal regimes. In countries where legal protection for investors is weak, the expropriation risk associated with cash and other liquid assets is likely to be much higher. Under this condition, the *utilization uncertainty* hypothesis suggests that the asset-stock liquidity relation be more negative in countries with a weak legal regime. To investigate the effects of different legal regimes on the asset-stock liquidity relation, we split our sample based on either the country's legal origin or anti-self-dealing index (*ANTI*).

[Insert Table 8 here]

Panel A and Panel B of Table 8 report the results from the re-estimation of the asset-stock liquidity relation for the legal origin sub-samples and the *ANTI* sub-samples, respectively. Contrary to the *utilization uncertainty* hypothesis, we find that the asset-stock liquidity relation is

not only positive, but significantly stronger in countries with a weak legal regime. The results presented in Table 8 may be attributed to the positive correlation between the weak legal regime and the poor accounting information environment among the 47 countries. Empirically, the asset-stock liquidity relation depends on whether the *valuation uncertainty* effect or the *utilization uncertainty* effect is stronger. Our results indicate that the *valuation uncertainty* effect strongly dominates the *utilization uncertainty* effect in countries with a weak legal protection. Contrary to Kalcheva and Lins (2007)[13], we find that higher cash and other liquid assets holdings contribute positively to the improvement in stock liquidity in countries with a weak legal regime.

Second, we examine the validity of our results using the bid-ask spread as an alternate measure of stock liquidity and report the results of hypotheses H2 and H3 in Table 9. Overall, we do not find any meaningful results using the bid-ask spread. Thus, our findings are applicable to the measure of stock liquidity based on the Zero Proportion only.

[Insert Table 9 here]

7. Transparency and Liquidity Effects associated with Asset-Stock Liquidity Relation

We now examine the individual balance sheet (Cash, Current Assets, Fixed Asset, and Intangible Assets) item's relation with stock liquidity. As shown in Panel A of Table 10, we find that stock liquidity is positively related to both the firm's cash holdings *(WAL1*) and intangible assets (*INTANGIBLE*). We also find a significant positive relation between non-cash current assets and stock liquidity. There is no statistically significant relation between fixed assets and stock liquidity.

[Insert Table 10 here]

[13] They find no evidence of a relative benefit of holding cash when country-level legal regime is poor.

As discussed previously in Section 2, cash and its equivalents are both significantly less opaque and more liquid than other assets. The positive relation between cash holdings and stock liquidity may be due to transparency and/or liquidity reasons. In contrast, intangible assets are relatively illiquid. Thus, any significant relation that intangible assets have with stock liquidity is largely attributed to transparency reason, rather than liquidity reason. Although intangible assets are relatively more opaque than other assets, the accounting process of capitalizing and recording such assets on the balance sheet may actually increase the transparency of firms that do so, compared to firms that do not capitalize their intangible assets. In basic accounting, intangible assets acquired in an arm's length transaction are recognized based on their acquisition cost; while intangible assets received gratis are recorded at their fair value if there is an active market for such assets. For internally generated intangible assets, accounting standard allows the capitalization of development costs, but requires the expensing of research costs. Intangible assets are important on- and off-balance sheet revenue producing assets that account for a significant portion of a firm's value. The financial statement recognition of such assets is therefore informative. Although many scholars argue that accountants do not do a good job in assessing the value of intangible assets, the accounting recognition and disclosure of such assets actually enhance the transparency of firms that account for such assets.

As a further test of the transparency effect associated with a firm's cash holdings and intangible assets, we examine both the cash-stock liquidity and intangible assets-stock liquidity relations under different accounting information environments. If the above asset-stock liquidity relations are driven by transparency effect, then we would expect both asset-stock liquidity relations to be stronger in countries with poor accounting standards, i.e., investors rely more on firm-level asset transparency to resolving *valuation uncertainty* when external accounting

information environment is poor. Our empirical finding is consistent with the above expectation. As reported in Panel B of Table 10, we find that the coefficient estimates for both *WAL1* and *INTANGIBLE* variables are significantly higher in countries with poor accounting standards.

[Insert Table 11 here]

To study the liquidity effect, we then examine the asset-stock liquidity relations for firms that are financially constrained versus those that are not. We do so by interacting the individual balance sheet (Cash, Current Assets, Fixed Asset, and Intangible Assets) item with the financial constraint measure (*FINCON*). For robustness, we use two widely used measures of a firm's financial constraints in the literature, namely the Kaplan and Zingales (1997) KZ index and the Whited and Wu (2006) WW index. Empirically, as reported in Table 11, we find that financially constrained firms (as measured by *FINCON*) have significantly lower stock liquidity. More importantly, the coefficient estimate for the *WAL1*FINCON* interaction term is consistently significant under both the LIQ measure of liquidity and the bid-ask spread measure of liquidity. In the other words, cash-stock liquidity relation is significantly stronger under financially-constraint firms. The *INTANGIBLE*FINCON* interaction term is not significant under the LIQ measure of liquidity. The bid-ask spread measure of liquidity, in contrast, yields inconclusive and contradictory *INTANGIBLE*FINCON* interaction results.

Thus, our results indicate that from a liquidity perspective, cash and its equivalents play a significant role in resolving *valuation uncertainty* associated with financially constrained firms[14]. In contrast, intangible assets are relatively illiquid and, hence, do not play any significant role in resolving the problems faced by financially constrained firms. Overall, the above findings indicate that the cash-stock liquidity relation is driven by both transparency and liquidity effects

[14] Shleifer and Vishny (1992) point out that distress firms suffer from the low value for fire assets sales especially for the illiquid assets.

while the intangible assets-stock liquidity relation is attributed largely to a transparency effect only. The findings for the non-cash current assets and stock liquidity relation and the fixed assets and stock liquidity relation are generally mixed and inconclusive.

8. Conclusions

In this study, we examine the relation between asset liquidity and stock liquidity across 47 countries. Consistent with the *valuation uncertainty* hypothesis, we find strong evidence of a positive relation between asset liquidity and stock liquidity in international capital markets. We also find that the accounting information environment is an important determinant of the asset-stock liquidity relation. The asset-stock liquidity relation is stronger in countries with poor accounting standards. We report some evidence that the improved accounting information environment in the post-IFRS period results in a structural decline in the asset-stock liquidity relation in countries with a strong legal regime. Our findings are consistent with the *valuation uncertainty* hypothesis, which posits that in countries where accounting standards and information disclosure quality are poor, investors are more reliant on the firm's asset liquidity structure to value the firm.

Overall, our findings also add to the literature on the value of cash holdings in international capital markets (Dittmar et al., 2003; Kalcheva and Lins, 2007; Pinkowitz et al., 2006). The finding on the relation between asset liquidity and stock liquidity in international capital markets indicates that liquid assets holdings in a firm can contribute positively to the firm's stock liquidity, especially in countries with poor accounting standards. Our findings also open up the possibility that managers can actively manage asset structure to influence stock liquidity. To do so, managers may need to include current assets in addition to cash in treasury

and management. Finally, although our paper primarily addresses the asset-stock liquidity relation, it is also theoretically possible to develop such a relation for asset liquidity and debt securities liquidity. This issue, however, is beyond the scope of this paper.

Despite these findings, we do not attempt to determine whether our IFRS-based results are due to the adoption of IFRS per se (Daske et al., 2008; Byard et al., 2011; Horton et al., 2013; Tan et al. 2011) or due to changes in reporting enforcement (Christensen et al., 2013a). To do so, one needs to develop a research design that convincingly separates the effects associated with the change in accounting standards from the effects associated with changes in reporting enforcement. However, the debate between Barth and Israeli (2013) and Christensen et al. (2013b) suggests that coming up with a convincing research design to tackle this problem is not easy. This issue is a promising area for further research.

References

Aboody, D. and B. Lev (2000), 'Information Asymmetry, R&D, and Insider Gains', Journal of Finance, Vol. 55, No. 6, pp. 2747-66.

Bae, K. H., H. Tan and M. Welker (2008), 'International GAAP Differences: The Impact on Foreign Analysts', The Accounting Review, Vol. 83, No. 3, pp. 593-628.

Ball, R. (2006), 'International Financial Reporting Standards (IFRS): Pros and Cons for Investors', Accounting and Business Research, Vol. 36, No. Sup1, pp. 5-27.

Barth, M. and D. Israeli (2013), 'Identification and Inferences in International Accounting Research', Working Paper, Stanford University, Available at SSRN: http://ssrn.com/abstract= 2310169.

Bates, T. W., K. M. Kahle and R. M. Stulz (2009), 'Why Do U.S. Firms Hold So Much More Cash Than They Used To?', The Journal of Finance, Vol. 64, No. 5, pp. 1985-2021.

Bekaert, G., C. R. Harvey and C. Lundblad (2007), 'Liquidity and Expected Returns: Lessons from Emerging Markets', Review Financial Studies, Vol. 20, No. 6, pp. 1783-831.

Berger, A. N. and C. H. S. Bouwman (2009), 'Bank Liquidity Creation', Review Financial Studies, Vol. 22, No. 9, pp. 3779-837.

Bushman, R. M., J. D. Piotroski and A. J. Smith (2004), 'What Determines Corporate Transparency?', Journal of Accounting Research, Vol. 42, No. 2, pp. 207-52.

Byard, D., Y. Li and Y. Yu (2011), 'The Effect of Mandatory IFRS Adoption on Financial Analysts' Information Environment', Journal of Accounting Research, Vol. 49, No. 1, pp. 69-96.

Choi, F. D. and G. Meek (2010), International Accounting, 7th Edition (Prentice Hall).

Christensen, H. B., L. Hail and C. Leuz (2013a), 'Mandatory IFRS Reporting and Changes in Enforcement', Working Paper, University of Chicago and University of Pennsylvania, Available at SSRN: http://ssrn.com/abstract=2017160.

Christensen, H. B., L. Hail and C. Leuz (2013b), 'Proper Inferences or a Market for Excuses? The Capital-Market Effects of Mandatory IFRS Adoption', Working Paper, University of Chicago and University of Pennsylvania, Available at SSRN: http://ssrn.com/abstract=2319475.

Daske, H., L. Hail, C. Leuz and R. Verdi (2008), 'Mandatory IFRS Reporting around the World: Early Evidence on the Economic Consequences', Journal of Accounting Research, Vol. 46, No. 5, pp. 1085-142.

Daske, H., L. Hail, C. Leuz and R. Verdi (2013), 'Adopting a Label: Heterogeneity in the Economic Consequences around IAS/IFRS Adoptions', Journal of Accounting Research, Vol. 51, No. 3, pp. 495-547.

Dittmar, A., J. Mahrt-Smith and H. Servaes (2003), 'International Corporate Governance and Corporate Cash Holdings', The Journal of Financial and Quantitative Analysis, Vol. 38, No. 1, pp. 111-33.

Djankov, S., R. La Porta, F. Lopez-de-Silanes and A. Shleifer (2008), 'The Law and Economics of Self-Dealing', Journal of Financial Economics, Vol. 88, No. 3, pp. 430-65.

Durnev, A. and E. H. Kim (2005), 'To Steal or Not to Steal: Firm Attributes, Legal Environment, and Valuation', The Journal of Finance, Vol. 60, No. 3, pp. 1461-93.

Glosten, L. R. and P. R. Milgrom (1985), 'Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders', Journal of Financial Economics, Vol. 14, No. 1, pp. 71-100.

Gopalan, R., O. Kadan and M. Pevzner (2012), 'Asset Liquidity and Stock Liquidity', Journal of Financial and Quantitative Analysis, Vol. 47, No. 2, pp. 333-64.

Goyenko, R. Y., C. W. Holden and C. A. Trzcinka (2009), 'Do Liquidity Measures Measure Liquidity?', Journal of Financial Economics, Vol. 92, No. 2, pp. 153-81.

Griffin, J. M., P. J. Kelly and F. Nardari (2009), 'Are Emerging Markets More Profitable? Implications for Comparing Weak and Semi-Strong Form Efficiency', Working Paper, University of Texas at Austin.

Healy, P. M., A. P. Hutton and K. G. Palepu (1999), 'Stock Performance and Intermediation Changes Surrounding Sustained Increases in Disclosure', Contemporary Accounting Research, Vol. 16, No. 3, pp. 485-520.

Horton, J., G. Serafeim and I. Serafeim (2013), 'Does Mandatory Ifrs Adoption Improve the Information Environment', Contemporary Accounting Research, Vol. 30, No. 1, pp. 388-423.

Huang, R. D. and H. R. Stoll (1997), 'The Components of the Bid-Ask Spread: A General Approach', Review Financial Studies, Vol. 10, No. 4, pp. 995-1034.

Ince, O. S. and R. B. Porter (2006), 'Individual Equity Return Data from Thomson Datastream: Handle with Care!', Journal of Financial Research, Vol. 29, No. 4, pp. 463-79.

Kalcheva, I. and K. V. Lins (2007), 'International Evidence on Cash Holdings and Expected Managerial Agency Problems', Review Financial Studies, Vol. 20, No. 4, pp. 1087-112.

Kaplan, S. N. and L. Zingales (1997), 'Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?', The Quarterly Journal of Economics, Vol. 112, No. 1, pp. 169-215.

Klapper, L. F. and I. Love (2004), 'Corporate Governance, Investor Protection, and Performance in Emerging Markets', Journal of Corporate Finance, Vol. 10, No. 5, pp. 703-28.

Kothari, S. P., T. Laguerre and A. Leone (2002), 'Capitalization Versus Expensing: Evidence on the Uncertainty of Future Earnings from Capital Expenditures Versus R&D Outlays', Review of Accounting Studies, Vol. 7, No. 4, pp. 355-82.

Kyle, A. S. (1985), 'Continuous Auctions and Insider Trading', Econometrica, Vol. 53, No. 6, pp. 1315-35.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. W. Vishny (1998), 'Law and Finance', The Journal of Political Economy, Vol. 106, No. 6, pp. 1113-55.

Lang, M., K. V. Lins and M. Maffett (2012), 'Transparency, Liquidity, and Valuation: International Evidence on When Transparency Matters Most', Journal of Accounting Research, Vol. 50, No. 3, pp. 729-74.

Lazonick, W. (2008), 'Everyone Is Paying Price for Share Buybacks', Financial Times (September 25).

Leftwich, R. (1981), 'Evidence of the Impact of Mandatory Changes in Accounting Principles on Corporate Loan Agreements', Journal of Accounting and Economics, Vol. 3, No. 1, pp. 3-36.

Lesmond, D. A. (2005), 'Liquidity of Emerging Markets', Journal of Financial Economics, Vol. 77, No. 2, pp. 411-52.

Lesmond, D. A., J. P. Ogden and C. A. Trzcinka (1999), 'A New Estimate of Transaction Costs', Review of Financial Studies, Vol. 12, No. 5, pp. 1113-41.

Leuz, C. and R. E. Verrecchia (2000), 'The Economic Consequences of Increased Disclosure', Journal of Accounting Research, Vol. 38 (Supplement), pp. 91-124.

Myers, S. C. and R. G. Rajan (1998), 'The Paradox of Liquidity', Quarterly Journal of Economics, Vol. 113, No. 3, pp. 733-71.

Opler, T., L. Pinkowitz, R. Stulz and R. Williamson (1999), 'The Determinants and Implications of Corporate Cash Holdings', Journal of Financial Economics, Vol. 52, No. 1, pp. 3-46.

Pinkowitz, L., R. Stulz and R. Williamson (2006), 'Does the Contribution of Corporate Cash Holdings and Dividends to Firm Value Depend on Governance? A Cross-Country Analysis', Journal of Finance, Vol. 61, No. 6, pp. 2725-51.

Shleifer, A. and R.W. Vishny (1992), 'Liquidation Values and Debt Capacity: A Market Equilibrium Approach', The Journal of Finance, Vol. 47, No. 4, pp. 1343-66.

Sloan, R. G. (1996), 'Do Stock Prices Fully Reflect Information in Accruals and Cash Flows About Future Earnings?', The Accounting Review, Vol. 71, No. 3, pp. 289-315.

Stoll, H. R. (2000), 'Presidential Address: Friction', Journal of Finance, Vol. 55, No. 4, pp. 1479-514.

Tan, H., S. Wang and M. Welker (2011), 'Analyst Following and Forecast Accuracy after Mandated IFRS Adoptions', Journal of Accounting Research, Vol. 49, No. 5, pp. 1307-57.

Welker, M. (1995), 'Disclosure Policy, Information Asymmetry, and Liquidity in Equity Markets', Contemporary Accounting Research, Vol. 11, No. 2, pp. 801-27.

Whited, T. M. and G. Wu (2006), 'Financial Constraints Risk', Review of Financial Studies, Vol. 19, No. 2, pp. 531-59.

Appendix 1
Description of Variables

Variable	Description	Source
LIQ	Proportion of trading days with non-zero return in a given year	Datastream/Worldscope
lnBAS	Log of average closing bid-ask spread in a given year. The daily closing bid-ask spread is measured by the absolute difference of closing ask and bid prices deflated by the average of bid and ask prices.	Datastream/Worldscope
WAL1	*WAL1* is equal to cash and cash equivalents divided by lagged value of Total Assets.	Datastream/Worldscope
WAL2	*WAL2* is equal to (Cash + 0.5*Non-cash Current Assets) divided by lagged value of Total Assets.	Datastream/Worldscope
WAL3	*WAL3* is equal to (Cash + 0.75*Non-cash Current Assets + 0.5*Tangible Fixed Assets) divided by lagged value of Total Assets.	Datastream/Worldscope
POSTIFRS	An indicator variable that is equal to 1 for post-IFRS adoption firm-year observations and 0 otherwise.	Datastream/Worldscope and Daske et al. (2008)
MV	Log of the firm's market capitalization in million US dollars.	Datastream/Worldscope
BM	Book-to-market equity ratio.	Datastream/Worldscope
PRICE	Log of stock price in US dollars.	Datastream/Worldscope
LEVERAGE	Ratio of Total Debt to Total Assets.	Datastream/Worldscope
ACCRUAL	Sloan's (1996) measure of a firm's accruals.	Datastream/Worldscope
RETVOL	Log of standard deviation of monthly stock returns over preceding twelve months.	Datastream/Worldscope
CAPEX	Ratio of firm's Capital Expenditures to lagged Total Assets.	Datastream/Worldscope
ROA	Ratio of EBITDA to lagged value of Total Assets.	Datastream/Worldscope
BHAR	Buy-and-hold annual abnormal stock returns, which is equal to firm's annual stock return minus the return on the country's stock market.	Datastream/Worldscope
ACCSTD	La Porta et al.'s (1998) index that measures a nation's quality of accounting standards.	LLSV (1998)
LAW	Legal origin of a country.	Djankov et al. (2008)
ANTI	Anti-self-dealing index compiled by Djankov et al. (2008)	Djankov et al. (2008)

This appendix describes all variables used in the analysis and their data sources.

Table 1
Summary Statistics of Asset and Stock Liquidity Measures

		WAL1			WAL2			WAL3			LIQ			lnBAS			
Country	NObs	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std	NObs	Mean	Median	Std
Argentina	390	0.082	0.060	0.083	0.253	0.206	0.171	0.629	0.585	0.200	65.728	72.801	24.058	166	-3.733	-3.747	0.786
Australia	2,632	0.182	0.077	0.264	0.335	0.270	0.277	0.620	0.569	0.336	85.470	92.308	19.713	2,193	-3.952	-3.994	0.924
Austria	459	0.107	0.071	0.142	0.304	0.281	0.175	0.604	0.596	0.200	73.482	87.500	28.689	345	-3.950	-3.870	1.036
Belgium	757	0.125	0.079	0.138	0.340	0.313	0.188	0.608	0.593	0.213	78.507	87.160	22.753	741	-4.390	-4.288	1.061
Brazil	407	0.185	0.141	0.170	0.358	0.318	0.220	0.655	0.622	0.234	78.012	93.227	29.146	389	-3.768	-4.079	1.281
Canada	4,345	0.198	0.076	0.296	0.335	0.253	0.312	0.671	0.600	0.351	84.673	89.641	15.914	1,839	-4.194	-4.187	1.033
Chile	631	0.098	0.054	0.139	0.233	0.199	0.162	0.577	0.580	0.197	55.861	58.333	31.222	249	-3.556	-3.589	1.066
China	9,456	0.196	0.156	0.158	0.375	0.348	0.202	0.674	0.654	0.228	94.283	96.203	6.973	9,445	-6.222	-6.252	0.592
Czech Republic	62	0.093	0.038	0.162	0.204	0.120	0.197	0.563	0.553	0.144	82.202	97.211	29.037	0			
Denmark	1,018	0.149	0.076	0.213	0.353	0.322	0.228	0.650	0.631	0.247	65.670	75.498	27.223	928	-4.040	-4.061	1.061
Finland	1,075	0.139	0.084	0.164	0.351	0.319	0.188	0.613	0.598	0.202	77.910	84.064	20.037	1,043	-4.333	-4.282	1.056
France	4,949	0.162	0.113	0.167	0.404	0.378	0.198	0.627	0.614	0.225	78.588	87.352	23.038	4,899	-4.149	-4.086	1.335
Germany	4,880	0.169	0.098	0.199	0.384	0.350	0.215	0.618	0.601	0.235	80.055	87.747	21.060	4,590	-3.813	-3.714	0.885
Greece	1,203	0.086	0.044	0.131	0.321	0.297	0.164	0.636	0.617	0.181	80.832	84.980	15.020	533	-3.870	-3.925	0.740
Hong Kong	975	0.244	0.190	0.222	0.376	0.341	0.271	0.636	0.617	0.298	86.570	91.093	13.070	975	-4.880	-4.957	0.786
Hungary	210	0.098	0.062	0.101	0.300	0.281	0.175	0.640	0.623	0.180	79.189	88.486	22.224	149	-3.123	-3.273	0.858
India	4,610	0.104	0.045	0.153	0.360	0.317	0.204	0.715	0.680	0.232	95.596	98.795	9.558	367	-5.324	-5.335	0.731
Indonesia	305	0.201	0.149	0.176	0.416	0.387	0.209	0.788	0.735	0.244	59.208	67.755	29.158	249	-3.761	-4.002	1.267
Ireland	266	0.229	0.154	0.206	0.401	0.390	0.203	0.651	0.642	0.244	90.632	100.000	20.152	224	-4.194	-4.217	0.837
Israel	1,213	0.189	0.120	0.216	0.391	0.364	0.226	0.630	0.613	0.249	77.980	91.429	24.824	932	-3.567	-3.367	1.282
Italy	1,631	0.126	0.086	0.131	0.339	0.318	0.174	0.588	0.582	0.223	91.659	95.238	11.477	1,630	-4.495	-4.614	0.870
Japan	23,727	0.162	0.127	0.134	0.354	0.344	0.149	0.612	0.605	0.132	84.734	91.020	16.946	18,571	-4.704	-4.790	0.869
Luxembourg	43	0.125	0.059	0.142	0.251	0.219	0.176	0.471	0.427	0.186	64.503	80.460	32.572	21	-4.369	-4.523	0.880
Malaysia	1,988	0.174	0.126	0.160	0.346	0.326	0.178	0.659	0.650	0.213	72.028	73.984	15.732	1,864	-4.103	-4.252	0.720
Mexico	669	0.108	0.080	0.096	0.270	0.234	0.153	0.614	0.612	0.187	87.220	100.000	25.046	576	-3.950	-4.062	1.127
Netherlands	1,086	0.128	0.066	0.167	0.371	0.324	0.220	0.631	0.616	0.269	83.867	91.700	19.696	930	-4.762	-4.715	1.326
New Zealand	494	0.074	0.025	0.128	0.240	0.220	0.194	0.573	0.555	0.214	66.012	72.619	21.524	494	-4.137	-4.216	0.805

		WAL1			WAL2			WAL3			LIQ			lnBAS			
Country	NObs	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std	NObs	Mean	Median	Std
Norway	882	0.205	0.121	0.245	0.353	0.277	0.281	0.641	0.588	0.310	72.819	83.333	25.745	882	-3.990	-4.030	1.219
Pakistan	557	0.162	0.090	0.191	0.385	0.359	0.206	0.737	0.711	0.205	67.786	80.913	30.485	185	-1.667	-1.293	1.291
Peru	326	0.150	0.081	0.204	0.312	0.259	0.231	0.644	0.596	0.235	85.610	100.000	24.763	73	-3.229	-3.190	0.871
Philippines	131	0.189	0.137	0.177	0.312	0.282	0.196	0.637	0.599	0.216	63.971	71.311	23.769	131	-4.103	-4.389	1.158
Poland	935	0.122	0.066	0.183	0.360	0.310	0.242	0.681	0.632	0.296	86.926	89.286	10.561	908	-4.283	-4.302	0.828
Portugal	422	0.070	0.040	0.099	0.243	0.205	0.149	0.529	0.510	0.193	74.060	81.347	23.654	422	-4.238	-4.419	1.306
Russia	11	0.076	0.061	0.082	0.269	0.227	0.155	0.644	0.620	0.222	33.114	33.600	16.157	11	-2.707	-2.794	0.633
Singapore	873	0.207	0.156	0.182	0.364	0.329	0.224	0.629	0.601	0.252	79.382	81.992	17.558	669	-4.451	-4.672	0.828
South Africa	1,173	0.163	0.122	0.151	0.381	0.367	0.200	0.690	0.674	0.235	76.292	83.871	22.054	1,172	-4.052	-4.163	0.913
South Korea	5,825	0.130	0.091	0.130	0.325	0.302	0.164	0.636	0.614	0.192	91.545	92.771	5.303	5,548	-4.998	-4.996	0.634
Spain	931	0.105	0.066	0.129	0.316	0.289	0.184	0.629	0.614	0.215	87.179	92.800	16.149	906	-5.128	-5.045	0.961
Sri Lanka	247	0.132	0.080	0.177	0.310	0.281	0.224	0.691	0.660	0.254	50.062	51.667	26.256	111	-2.593	-2.546	0.862
Sweden	1,889	0.176	0.098	0.215	0.393	0.349	0.233	0.616	0.596	0.262	81.277	85.771	15.608	1,546	-4.269	-4.278	1.014
Switzerland	1,692	0.174	0.130	0.171	0.369	0.348	0.198	0.629	0.616	0.211	76.745	85.317	23.076	1,691	-4.416	-4.305	1.135
Taiwan	3,424	0.226	0.183	0.176	0.425	0.401	0.208	0.703	0.683	0.213	90.521	91.600	5.584	1,821	-5.654	-5.725	0.484
Thailand	1,298	0.124	0.082	0.125	0.291	0.277	0.153	0.607	0.609	0.168	65.375	70.498	28.502	870	-3.752	-4.051	1.118
Turkey	1,586	0.154	0.081	0.209	0.420	0.379	0.245	0.777	0.723	0.297	83.414	84.337	5.466	1,347	-4.782	-4.855	0.313
UK	6,539	0.168	0.095	0.219	0.364	0.321	0.250	0.622	0.601	0.283	65.521	68.651	28.744	6,538	-3.917	-3.687	1.242
US	29,731	0.220	0.110	0.277	0.393	0.334	0.289	0.639	0.594	0.295	92.995	97.222	10.226	12,078	-5.641	-6.044	1.280
Venezuela	29	0.119	0.088	0.087	0.261	0.215	0.165	0.676	0.634	0.251	65.296	79.675	30.974	0			
All Countries	127,982	0.176	0.110	0.207	0.366	0.331	0.228	0.640	0.614	0.245	85.259	92.713	18.864	91,251	-4.745	-4.761	1.260

This table reports summary statistics of the asset liquidity and stock liquidity variables. *WAL1*, *WAL2*, and *WAL3* are the three different measures of asset liquidity. *WAL1* is equal to cash and cash equivalents divided by lagged value of Total Assets. *WAL2* is equal to (Cash + 0.5*Non-cash Current Assets) divided by lagged value of Total Assets. *WAL3* is equal to (Cash + 0.75*Non-cash Current Assets + 0.5*Tangible Fixed Assets) divided by lagged value of Total Assets. *LIQ* (stock liquidity), which is equal to the proportion of non-zero return trading days in a given year. *lnBAS* is log of average closing bid-ask spread in a given year. The daily closing bid-ask spread is measured by the absolute difference of closing ask and bid prices deflated by the average of bid and ask prices. All continuous variables are winsorized at the 1st and 99th percentiles. There are 47 countries in the sample. NObs is the number of firm-year observations for each country. Sample period is 1996-2010.

Table 2
Summary Statistics for Firm-level Characteristics and Country-level Institutional Factors

Country	NObs	ACCSTD	LAW	ANTI	MV	BM	PRICE	LEVERAGE	ACCRUAL	RETVOL	CAPEX	ROA	BHAR
Argentina	390	45	Civil	0.342	4.882	1.556	0.616	0.250	-0.034	-2.155	0.061	7.696	0.165
Australia	2,632	75	Common	0.757	5.567	0.548	0.746	0.196	-0.035	-2.344	0.078	4.993	0.278
Austria	459	54	Civil	0.213	5.361	1.266	3.727	0.257	-0.051	-2.556	0.070	4.724	0.038
Belgium	757	61	Civil	0.544	5.468	0.777	3.701	0.251	-0.055	-2.512	0.071	4.661	0.024
Brazil	407	54	Civil	0.274	6.462	1.223	2.182	0.295	-0.024	-2.028	0.068	9.806	0.234
Canada	4,345	74	Common	0.642	5.375	0.775	1.699	0.188	-0.045	-2.167	0.089	0.064	0.222
Chile	631	52	Civil	0.625	6.206	0.834	1.068	0.238	-0.036	-2.685	0.066	8.904	0.104
China	9,456		Civil	0.763	5.896	0.393	0.218	0.266	-0.019	-2.127	0.067	4.694	0.082
Czech Republic	62		Civil	0.333	6.757	1.297	3.172	0.153	-0.073	-2.397	0.074	7.562	-0.004
Denmark	1,018	62	Civil	0.463	4.897	0.925	3.572	0.254	-0.039	-2.426	0.070	3.673	0.024
Finland	1,075	77	Civil	0.457	5.360	0.837	2.235	0.234	-0.048	-2.404	0.064	6.283	0.019
France	4,949	69	Civil	0.379	5.169	0.792	3.338	0.210	-0.044	-2.318	0.049	3.483	0.046
Germany	4,880	62	Civil	0.282	4.828	0.959	2.734	0.201	-0.052	-2.243	0.054	1.663	0.035
Greece	1,203	55	Civil	0.217	4.413	1.168	1.224	0.294	-0.024	-2.102	0.054	3.911	0.044
Hong Kong	975	69	Common	0.963	7.275	0.662	0.360	0.172	-0.022	-2.265	0.059	10.798	0.420
Hungary	210		Civil	0.181	4.740	1.127	2.372	0.171	-0.055	-2.215	0.095	5.638	-0.012
India	4,610	57	Common	0.579	5.101	0.843	1.394	0.278	-0.009	-1.951	0.089	10.282	0.191
Indonesia	305		Civil	0.653	5.802	0.779	0.217	0.235	-0.022	-2.145	0.085	13.954	0.327
Ireland	266		Common	0.789	6.554	0.544	1.712	0.250	-0.032	-2.417	0.057	7.550	0.152
Israel	1,213	64	Common	0.725	4.360	0.954	1.456	0.297	-0.027	-2.203	0.041	4.843	0.124
Italy	1,631	62	Civil	0.421	5.805	0.894	1.553	0.263	-0.043	-2.421	0.047	2.667	0.010
Japan	23,727	65	Civil	0.499	5.529	1.191	1.905	0.232	-0.031	-2.391	0.039	2.148	0.063
Luxembourg	43		Civil	0.283	6.624	1.542	3.696	0.209	-0.065	-2.521	0.047	3.869	-0.012
Malaysia	1,988	76	Common	0.950	5.178	0.745	0.149	0.187	-0.015	-2.386	0.059	8.381	0.162
Mexico	669	60	Civil	0.172	6.737	1.092	0.756	0.223	-0.023	-2.354	0.058	8.588	0.093
Netherlands	1,086	64	Civil	0.203	5.925	0.606	2.895	0.218	-0.048	-2.428	0.057	6.120	0.037
New Zealand	494	70	Common	0.950	5.114	0.655	0.632	0.256	-0.033	-2.657	0.066	8.507	0.075

Country	NObs	ACCSTD	LAW	ANTI	MV	BM	PRICE	LEVERAGE	ACCRUAL	RETVOL	CAPEX	ROA	BHAR
Norway	882	74	Civil	0.421	5.537	0.790	1.900	0.312	-0.041	-2.193	0.089	3.819	0.133
Pakistan	557		Common	0.408	4.361	0.769	0.559	0.234	-0.015	-2.214	0.082	12.797	0.191
Peru	326	38	Civil	0.450	4.649	2.036	0.746	0.176	-0.035	-2.329	0.066	13.410	0.294
Philippines	131	65	Civil	0.215	6.636	0.698	1.009	0.272	-0.044	-2.339	0.088	10.347	0.232
Poland	935		Civil	0.288	4.348	0.899	1.717	0.178	-0.027	-2.033	0.073	5.779	0.227
Portugal	422	36	Civil	0.444	5.286	1.014	1.605	0.364	-0.057	-2.522	0.054	3.198	-0.008
Russia	11		Civil	0.440	5.826	4.501	1.899	0.156	0.025	-1.720	0.071	13.722	1.246
Singapore	873	78	Common	1.000	6.272	0.991	0.415	0.199	-0.021	-2.367	0.062	7.982	0.178
South Africa	1,173	70	Common	0.813	6.067	0.674	1.185	0.154	-0.026	-2.350	0.074	11.603	0.114
South Korea	5,825	62	Civil	0.469	4.463	1.988	2.196	0.282	-0.027	-1.982	0.053	4.703	0.061
Spain	931	64	Civil	0.374	6.446	0.641	2.536	0.274	-0.037	-2.506	0.057	6.103	0.044
Sri Lanka	247		Common	0.392	3.027	1.059	0.264	0.187	-0.006	-2.115	0.056	9.396	0.242
Sweden	1,889	83	Civil	0.333	4.984	0.701	1.843	0.191	-0.038	-2.248	0.045	2.648	0.095
Switzerland	1,692	68	Civil	0.267	5.825	0.872	5.024	0.216	-0.046	-2.517	0.046	4.852	0.059
Taiwan	3,424	65	Civil	0.565	5.754	0.571	0.109	0.187	-0.018	-2.163	0.061	9.004	0.236
Thailand	1,298	64	Common	0.813	4.404	1.042	0.381	0.244	-0.040	-2.354	0.071	9.476	0.203
Turkey	1,586	51	Civil	0.429	4.643	0.876	1.597	0.199	-0.013	-1.918	0.062	9.598	0.058
UK	6,539	78	Common	0.950	5.548	0.673	1.210	0.165	-0.041	-2.329	0.057	4.482	0.132
US	29,731	71	Common	0.654	6.062	0.675	2.641	0.199	-0.040	-2.110	0.058	1.750	0.139
Venezuela	29	40	Civil	0.092	5.944	2.664	0.788	0.120	-0.069	-1.947	0.065	9.261	0.207
All Countries	127,982	63.081		0.499	5.545	0.874	1.879	0.221	-0.034	-2.230	0.058	3.980	0.114

This table reports the average values of the variables for both institutional and firm-level by country. *ACCSTD* is the La Porta et al.'s (1998) index that measures a nation's quality of accounting standards. *LAW* indicates the legal origin of a country. *ANTI* is the anti-self-dealing index compiled by Djankov et al. (2008). *MV* is equal to the log of the firm's market capitalization in million US dollars. *BM* is the book-to-market equity ratio. *PRICE* is equal to the log of stock price in US dollars. *LEVERAGE* is the ratio of Total Debt to Total Assets. *ACCRUAL* is the Sloan's (1996) measure of a firm's accruals. *RETVOL* is the log of standard deviation of monthly stock returns over the preceding twelve months. *CAPEX* is equal to the ratio of firm's Capital Expenditures to lagged Total Assets. *ROA* is the ratio of EBITDA to lagged value of Total Assets. *BHAR,* which is a measure of the buy-and-hold annual abnormal stock returns, is equal to firm's annual stock return minus the return on the country's stock market. All firm-level continuous firm-level characteristics are winsorized at the 1st and 99th percentiles. NObs is number of firm-year observations. Sample period is 1996-2010.

Table 3
Correlation Matrix

Variable	LIQ	lnBAS	WAL1	WAL2	WAL3	MV	BM	PRICE	LEVERAGE	ACCRUAL	RETVOL	CAPEX	ROA	BHAR
LIQ	1													
lnBAS	-0.683	1												
	(0.00)													
WAL1	0.063	-0.042	1											
	(0.00)	(0.00)												
WAL2	0.024	0.016	0.851	1										
	(0.00)	(0.00)	(0.00)											
WAL3	0.002	0.001	0.652	0.844	1									
	(0.48)	(0.68)	(0.00)	(0.00)										
MV	0.478	-0.649	-0.028	-0.125	-0.114	1								
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)									
BM	-0.176	0.246	-0.141	-0.134	-0.113	-0.381	1							
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)								
PRICE	0.171	-0.154	0.011	0.010	-0.014	0.421	-0.176	1						
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)							
LEVERAGE	0.033	-0.072	-0.365	-0.375	-0.226	0.037	0.049	-0.082	1					
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)						
ACCRUAL	0.020	-0.028	-0.006	0.119	0.106	-0.013	-0.015	-0.017	0.024	1				
	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)					
RETVOL	0.119	0.037	0.183	0.186	0.138	-0.213	0.019	-0.192	-0.006	-0.010	1			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)				
CAPEX	0.031	-0.038	-0.097	-0.176	0.089	0.082	-0.100	0.027	0.109	-0.112	0.022	1		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
ROA	0.036	-0.151	-0.159	-0.068	0.030	0.210	-0.069	0.167	-0.027	0.173	-0.210	0.093	1	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
BHAR	0.069	-0.064	0.126	0.142	0.162	0.090	-0.150	0.079	-0.062	0.036	0.270	0.013	0.106	1
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

This table presents the Pearson correlation matrix for firm-level variables. *LIQ* (stock liquidity), which is equal to the proportion of non-zero return trading days in a given year. *lnBAS* is log of average closing bid-ask spread in a given year. The daily closing bid-ask spread is measured by the absolute difference of closing ask and bid prices deflated by the average of bid and ask prices. *WAL1, WAL2*, and *WAL3* are the three different measures of asset liquidity. *WAL1* is equal to cash and cash equivalents divided by lagged value of Total Assets. *WAL2* is equal to (Cash + 0.5*Non-cash Current Assets) divided by lagged value of Total Assets. *WAL3* is equal to (Cash + 0.75*Non-cash Current Assets + 0.5*Tangible Fixed Assets) divided by lagged value of Total Assets. *MV* is equal to the log of the firm's market capitalization in million US dollars. *BM* is the book-to-market equity ratio. *PRICE* is equal to the log of stock price in US dollars. *LEVERAGE* is the ratio of Total Debt to Total Assets. *ACCRUAL* is the Sloan's (1996) measure of a firm's accruals. *RETVOL* is the log of standard deviation of monthly stock returns over the preceding twelve months. *CAPEX* is equal to the ratio of firm's Capital Expenditures to lagged Total Assets. *ROA* is the ratio of EBITDA to lagged value of Total Assets. *BHAR*, which is a measure of the buy-and-hold annual abnormal stock returns, is equal to firm's annual stock return minus the return on the country's stock market. All continuous firm-level characteristics in are winsorized at the 1st and 99th percentiles. The p-values are reported in parentheses. Sample period is 1996-2010.

Table 4
Multivariate Analysis of Asset Liquidity on Stock Liquidity

LIQ_i *or* $lnBAS_i = \alpha_0 + \beta_1 WAL_i + \gamma_j Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$

Variables	Model 1 LIQ	Model 2 LIQ	Model 3 LIQ
WAL1	2.203		
	(5.23)		
WAL2		3.155	
		(8.65)	
WAL3			2.290
			(8.80)
MV	5.437	5.483	5.481
	(22.11)	(22.18)	(22.12)
BM	0.125	0.186	0.153
	(0.58)	(0.87)	(0.72)
PRICE	-0.711	-0.722	-0.718
	(-3.88)	(-3.95)	(-3.90)
LEVERAGE	1.974	2.373	1.850
	(3.05)	(3.62)	(2.85)
ACCRUAL	3.412	2.698	2.911
	(4.30)	(3.52)	(3.88)
RETVOL	4.953	4.919	4.982
	(10.24)	(10.26)	(10.27)
CAPEX	0.588	1.246	-0.837
	(0.48)	(1.02)	(-0.68)
ROA	0.006	0.004	0.001
	(0.72)	(0.48)	(0.16)
BHAR	-0.621	-0.667	-0.674
	(-1.42)	(-1.53)	(-1.54)
Fixed Effects	C, I, Y	C, I, Y	C, I, Y
NObs	127,982	127,982	127,982
Adjusted R^2	0.47	0.47	0.47

This table reports the results of our multivariate regressions. The dependent variable is *LIQ* (non-zero return proportion), which is equal to the proportion of non-zero return trading days in a given year. *WAL1*, *WAL2*, and *WAL3* are the three different measures of asset liquidity. *WAL1* is equal to cash and cash equivalents divided by lagged value of Total Assets. *WAL2* is equal to (Cash + 0.5*Non-cash Current Assets) divided by lagged value of Total Assets. *WAL3* is equal to (Cash + 0.75*Non-cash Current Assets + 0.5*Tangible Fixed Assets) divided by lagged value of Total Assets. *MV* is equal to the log of the firm's market capitalization in million US dollars. *BM* is the book-to-market equity ratio. *PRICE* is equal to the log of stock price in US dollars. *LEVERAGE* is the ratio of Total Debt to Total Assets. *ACCRUAL* is the Sloan's (1996) measure of a firm's accruals. *RETVOL* is the log of standard deviation of monthly stock returns over the preceding twelve months. *CAPEX* is equal to the ratio of firm's Capital Expenditures to lagged Total Assets. *ROA* is the ratio of EBITDA to lagged value of Total Assets. *BHAR,* which is a measure of the buy-and-hold annual abnormal stock returns, is equal to firm's annual stock return minus the return on the country's stock market. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term and the Firm, Country (C), Industry (I), and Year (Y) fixed-effects are not tabulated. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.

Table 5
Asset Liquidity on Stock Liquidity -- ACCSTD Subsample Analysis

$$LIQ_i = \alpha_0 + \beta_1 WAL_i + \gamma_i Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$$

Variables	**Low ACCSTD**	**High ACCSTD**	**Low ACCSTD**	**High ACCSTD**	**Low ACCSTD**	**High ACCSTD**
	LIQ	LIQ	LIQ	LIQ	LIQ	LIQ
WAL1	6.031	0.935				
	(5.40)	(1.74)				
WAL2			6.281	2.376		
			(5.79)	(4.78)		
WAL3					3.897	2.050
					(4.61)	(5.44)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	29,371	86,519	29,371	86,519	29,371	86,519
Adjusted R^2	0.43	0.50	0.43	0.50	0.43	0.50
Δ WAL						
Coefficient	-5.097		-3.905		-1.847	
(t-statistics)	(-3.92)		(-3.08)		(-1.77)	

This table reports the *ACCSTD* sub-sample multivariate regression results. The sample is split into Low *ACCSTD* and High *ACCSTD* sub-samples. The High *ACCSTD* sub-sample consists of firms from countries with accounting standards index that is above the median; while the Low *ACCSTD* sub-sample consists of firms from countries with accounting standards index that is below the median. The dependent variable is *LIQ* (non-zero return proportion). *WAL1*, *WAL2*, and *WAL3* are the three different measures of asset liquidity. The firm-specific control variables included in the regression are *MV*, *BM*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *CAPEX*, *ROA*, and *BHAR*. The definitions for all the variables are provided in the Appendix. All continuous variables are winsorized at the 1st and 99th percentiles. *ΔWAL* Coefficient is equal to the difference in *WAL* coefficient estimates for the High *ACCSTD* and Low *ACCSTD* sub-samples. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term, firm-specific control variables, and Country (C), Industry (I), and Year (Y) fixed-effects are not tabulated. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.

Table 6
Impact of IFRS Adoption on Asset-Stock Liquidity Relationship

$$LIQ_i = \alpha_0 + \beta_1 WAL_i + \beta_2 POSTIFRS_i * WAL_i + \beta_3 POSTIFRS_i + \gamma_j Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$$

	Model 1	Model 2	Model 3
Variables	LIQ	LIQ	LIQ
WAL1	3.498		
	(2.45)		
WAL2		5.076	
		(3.91)	
WAL3			3.200
			(3.20)
POSTIFRS*WAL	-0.957	0.949	1.253
	(-0.63)	(0.80)	(1.27)
POSTIFRS	1.725	1.171	0.679
	(7.02)	(2.65)	(1.12)
Firm Controls	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y
NObs	33,729	33,729	33,729
Adjusted R^2	0.52	0.53	0.52

This table reports the multivariate regression results for the IFRS adoption. All samples from IFRS adopting countries are included. The dependent variable is *LIQ* (non-zero return proportion). *WAL1*, *WAL2*, and *WAL3* are the three different measures of asset liquidity. The firm-specific control variables included in the regression are *MV*, *BM*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *CAPEX*, *ROA*, and *BHAR*. All variables are defined in the Appendix. *POSTIFRS* is an indicator variable that is equal to 1 for post-IFRS adoption firm-year observations and 0 otherwise. All continuous variables are winsorized at the 1st and 99th percentiles. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term, firm-specific control variables, and Country (C), Industry (I), and Year (Y) fixed-effects are not reported. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.

Table 7

Impact of IFRS Adoption on Asset-Stock Liquidity Relationship: Sub-sample Analysis

$$LIQ_i = \alpha_0 + \beta_1 WAL_i + \beta_2 POSTIFRS_i * WAL_i + \beta_3 POSTIFRS_i + \gamma_j Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$$

Panel A: Sub-sample Analysis by Leagl Origin

	Civil Law	**Common Law**	**Civil Law**	**Common Law**	**Civil Law**	**Common Law**
Variables	LIQ	LIQ	LIQ	LIQ	LIQ	LIQ
WAL1	4.454	5.477				
	(2.28)	(3.18)				
WAL2			7.129	5.558		
			(4.16)	(3.10)		
WAL3					4.400	3.656
					(3.72)	(2.32)
POSTIFRS*WAL	-2.066	-3.078	-1.290	-0.537	-0.063	-0.510
	(-1.12)	(-1.82)	(-0.85)	(-0.32)	(-0.05)	(-0.29)
POSTIFRS	1.065	0.777	1.222	0.383	0.711	0.506
	(2.52)	(1.11)	(1.85)	(0.40)	(0.96)	(0.35)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	23,084	10,645	23,084	10,645	23,084	10,645
Adjusted R^2	0.49	0.63	0.49	0.64	0.49	0.63

Panel B: Sub-sample Analysis by Anti-self-dealing Index

	Low ANTI	**High ANTI**	**Low ANTI**	**High ANTI**	**Low ANTI**	**High ANTI**
Variables	LIQ	LIQ	LIQ	LIQ	LIQ	LIQ
WAL1	4.332	5.790				
	(1.97)	(3.64)				
WAL2			7.426	5.469		
			(4.08)	(3.40)		
WAL3					4.450	3.646
					(3.73)	(2.66)
POSTIFRS*WAL	-0.832	-3.916	-0.937	-0.526	-0.233	-0.202
	(-0.41)	(-2.72)	(-0.58)	(-0.36)	(-0.19)	(-0.14)
POSTIFRS	0.635	2.507	0.873	1.979	0.597	1.903
	(1.36)	(5.84)	(1.23)	(2.81)	(0.77)	(1.66)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	20,287	13,442	20,287	13,442	20,287	13,442
Adjusted R^2	0.47	0.63	0.47	0.63	0.47	0.63

This table reports the results of sub-sample analysis by legal regimes for the IFRS adoption. The dependent variable is *LIQ* (non-zero return proportion). In Panel A, the sample is split based on legal origin. In Panel B, the sample is split based on anti-self-dealing index (*ANTI*). The High *ANTI* and Low *ANTI* sub-samples consist of firms from countries with anti-self-dealing index that are above and below the median *ANTI*, respectively. The dependent variable is *LIQ* (stock liquidity). *WAL1*, *WAL2*, and *WAL3* are the three different measures of asset liquidity. The firm-specific control variables included in the regression are *MV*, *BM*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *CAPEX*, *ROA*, and *BHAR*. All variables are defined in the Appendix. *POSTIFRS* is an indicator variable that is equal to 1 for post-IFRS adoption firm-year observations and 0 otherwise. All continuous variables are winsorized at the 1st and 99th percentiles. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term, firm-specific control variables, and Country (C), Industry (I), and Year (Y) fixed-effects are not reported. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.

Table 8
Robustness Check – Sub-sample by Legal Regimes

$$LIQ_i = \alpha_0 + \beta_1 WAL_i + \gamma_i Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$$

Panel A: Sub-sample by Legal Origin

Variables	**Civil Law**	**Common Law**	**Civil Law**	**Common Law**	**Civil Law**	**Common Law**
	LIQ	LIQ	LIQ	LIQ	LIQ	LIQ
WAL1	3.754	2.075				
	(5.03)	(5.09)				
WAL2			5.179	2.479		
			(8.35)	(6.30)		
WAL3					3.225	1.901
					(6.84)	(5.93)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	71,041	56,941	71,041	56,941	71,041	56,941
Adjusted R^2	0.41	0.55	0.41	0.55	0.41	0.55
Δ WAL Coefficient		-1.679		-2.701		-1.324
(t-statistics)		(-2.02)		(-3.76)		(-2.24)

Panel B: Sub-sample by Anti-Self Dealing Index (ANTI)

Variables	**Low ANTI**	**High ANTI**	**Low ANTI**	**High ANTI**	**Low ANTI**	**High ANTI**
	LIQ	LIQ	LIQ	LIQ	LIQ	LIQ
WAL1	4.809	1.788				
	(4.04)	(4.47)				
WAL2			6.906	2.520		
			(6.63)	(6.86)		
WAL3					4.476	1.898
					(6.39)	(6.15)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	25,301	102,681	25,301	102,681	25,301	102,681
Adjusted R^2	0.44	0.49	0.44	0.49	0.44	0.49
Δ WAL Coefficient		-3.021		-4.386		-2.578
(t-statistics)		(-2.43)		(-4.03)		(-3.14)

This table reports the results of sub-sample analysis by legal regimes. In Panel A, the sample is split based on legal origins. In Panel B, the sample is split based on the anti-self-dealing index (*ANTI*). The High *ANTI* and Low *ANTI* sub-samples consist of firms from countries with anti-self-dealing index that are above and below the median *ANTI*, respectively. The dependent variable is *LIQ* (stock liquidity). *WAL1*, *WAL2*, and *WAL3* are the three different measures of asset liquidity. The firm-specific control variables included in the regression are *MV*, *BM*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *CAPEX*, *ROA*, and *BHAR*. All variables are defined in the Appendix. All continuous variables are winsorized at the 1st and 99th percentiles. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term, firm-specific control variables, and Country (C), Industry (I), and Year (Y) fixed-effects are not reported. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.

Table 9
Robustness Tests - Bid-Ask Spread

$$lnBAS_i = \alpha_0 + \beta_1 WAL_i + \gamma_j Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$$

$$lnBAS_i = \alpha_0 + \beta_1 WAL_i + \beta_2 POSTIFRS_i * WAL_i + \beta_3 POSTIFRS_i + \gamma_j Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$$

Panel A: Asset Liquidity on Stock Liquidity

Variables	Model 1 lnBAS	Model 2 lnBAS	Model 3 lnBAS
WAL1	-0.135		
	(-3.48)		
WAL2		-0.197	
		(-5.96)	
WAL3			-0.155
			(-6.60)
Firm Controls	Yes	Yes	
Fixed Effects	C, I, Y	C, I, Y	
NObs	91,251	91,251	91,251
Adjusted R^2	0.76	0.77	0.77

Panel B: Asset Liquidity on Stock Liquidity - ACCSTD Subsample Analysis

Variables	Low ACCSTD lnBAS	High ACCSTD lnBAS	Low ACCSTD lnBAS	High ACCSTD lnBAS	Low ACCSTD lnBAS	High ACCSTD lnBAS
WAL1	-0.146	-0.156				
	(-2.89)	(-3.02)				
WAL2			-0.269	-0.202		
			(-5.05)	(-4.76)		
WAL3					-0.195	-0.172
					(-4.50)	(-5.35)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	21,542	58,406	21,542	58,406	21,542	58,406
Adjusted R^2	0.67	0.76	0.67	0.76	0.67	0.76
Δ WAL Coefficient	-0.01		0.07		0.03	
(t-statistics)	(-0.18)		(-1.24)		-0.62	

Panel C: Impact of IFRS on Asset-Stock Liquidity Relationship

Variables	Model 1 lnBAS	Model 2 lnBAS	Model 3 lnBAS
WAL1	-0.024		
	(-0.52)		
WAL2		-0.233	
		(-4.75)	
WAL3			-0.262
			(-6.22)
POSTIFRS*WAL	-0.134	-0.022	0.085
	(-2.47)	(-0.40)	(1.91)
POSTIFRS	-0.086	-0.102	-0.166
	(-2.65)	(-2.49)	(-3.18)
Firm Controls	Yes	Yes	Yes
Fixed Effects	Firm	C, I, Y	Firm
NObs	31,292	31,292	31,292
Adjusted R^2	0.71	0.71	0.71

Panel D: Impact of IFRS - Subsample Analysis by Legal Origin

	Civil Law	Common Law	Civil Law	Common Law	Civil Law	Common Law
Variables	lnBAS	lnBAS	lnBAS	lnBAS	lnBAS	lnBAS
WAL1	0.022	-0.168				
	(0.37)	(-2.34)				
WAL2			-0.185	-0.357		
			(-3.38)	(-5.21)		
WAL3					-0.210	-0.349
					(-4.65)	(-5.93)
POSTIFRS*WAL	-0.227	0.084	-0.101	0.194	0.041	0.206
	(-3.76)	(0.92)	(-1.86)	(2.10)	(0.86)	(2.59)
POSTIFRS	0.038	0.001	0.040	-0.057	-0.029	-0.117
	(2.53)	(0.02)	(1.69)	(-0.78)	(-0.85)	(-1.35)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	21,127	10,165	21,127	10,165	21,127	10,165
Adjusted R^2	0.71	0.73	0.71	0.73	0.71	0.73

Panel E: Impact of IFRS - Subsample Analysis by Anti-self-dealing Index

	Low ANTI	High ANTI	Low ANTI	High ANTI	Low ANTI	High ANTI
Variables	lnBAS	lnBAS	lnBAS	lnBAS	lnBAS	lnBAS
WAL1	0.044	-0.179				
	(0.67)	(-2.94)				
WAL2			-0.178	-0.349		
			(-2.93)	(-5.71)		
WAL3					-0.215	-0.334
					(-4.34)	(-6.07)
POSTIFRS*WAL	-0.287	0.095	-0.139	0.179	0.032	0.197
	(-4.38)	(1.33)	(-2.48)	(2.29)	(0.65)	(2.80)
POSTIFRS	0.041	-0.108	0.048	-0.159	-0.031	-0.220
	(2.75)	(-1.88)	(1.86)	(-2.50)	(-0.83)	(-2.87)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	18,467	12,825	18,467	12,825	18,467	12,825
Adjusted R^2	0.71	0.73	0.71	0.73	0.71	0.74

This table reports the further results of asset-stock liquidity relationship using bid-ask spread (*lnBAS*) as a measure of stock liquidity. In Panel A, the results for full sample analysis using *lnBAS* is reported. In Panel B, the results for *ACCSTD* sub-sample is reported. In Panel C, the results for the impact of IFRS adoption on asset-stock liquidity relationship is reported. In Panel D, the sample is split based on legal origin for the IFRS adoption analysis. In Panel E, the sample is split based on anti-self-dealing index (*ANTI*) for the IFRS adoption analysis. The High *ANTI* and Low *ANTI* sub-samples consist of firms from countries with anti-self-dealing index that are above and below the median *ANTI*, respectively. *WAL1*, *WAL2*, and *WAL3* are the three different measures of asset liquidity. The firm-specific control variables included in the regression are *MV*, *BM*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *CAPEX*, *ROA*, and *BHAR*. All variables are defined in the Appendix. *POSTIFRS* is an indicator variable that is equal to 1 for post-IFRS adoption firm-year observations and 0 otherwise. All continuous variables are winsorized at the 1st and 99th percentiles. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term, firm-specific control variables, and Country (C), Industry (I), and Year (Y) fixed-effects are not reported. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.

Table 10

Comparing Different Asset Classes' Relation with Stock Liquidity

LIQ_i *or* $lnBAS_i = \alpha_0 + \beta_1 WAL_i + \beta_2 NONCASH\text{-}CA_i + \beta_3 FIXEDASSETS_i + \beta_4 INTANGIBLE_i + \gamma_j Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$

Panel A: Full Sample Analysis

	Model 1	Model 2	Model 3	Model 4
Variables	LIQ	LIQ	lnBAS	lnBAS
WAL1(CASH)	2.502	2.736	-0.151	-0.165
	(5.94)	(6.19)	(-4.00)	(-3.92)
NONCASH-CA	2.446	2.539	-0.168	-0.176
	(5.41)	(5.92)	(-7.04)	(-7.47)
FIXED ASSETS	-0.990	-0.630	0.024	0.001
	(-1.88)	(-1.27)	(1.13)	(0.07)
INTANGIBLE		3.252		-0.179
		(6.74)		(-5.60)
Firm Controls	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	119,735	119,735	87,799	87,799
Adjusted R^2	0.47	0.47	0.76	0.77

Panel B: Subsample Analysis by Accounting Standards

	Low ACCSTD	**High ACCSTD**	**Low ACCSTD**	**High ACCSTD**
Variables	LIQ	LIQ	lnBAS	lnBAS
WAL1(CASH)	6.225	1.615	-0.186	-0.195
	(5.23)	(2.70)	(-3.47)	(-3.34)
NONCASH-CA	2.590	3.555	-0.228	-0.169
	(2.86)	(6.67)	(-4.83)	(-6.05)
FIXED ASSETS	-0.863	-0.386	0.043	-0.046
	(-0.90)	(-0.55)	(1.41)	(-1.32)
INTANGIBLE	5.493	2.371	-0.165	-0.169
	(4.63)	(4.71)	(-3.22)	(-4.24)
Firm Controls	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	28,589	79,172	21,116	55,460
Adjusted R^2	0.43	0.50	0.67	0.76
Δ WAL1 Coef.	-4.610		-0.010	
(t-statistics)	(-3.31)		(-0.13)	
Δ NONCASH-CA Coef.	0.965		0.059	
(t-statistics)	(0.87)		(1.04)	
Δ FIXED ASSETS Coef.	0.478		-0.089	
(t-statistics)	(0.38)		(-1.85)	
Δ INTANGIBLE Coef.	-3.122		-0.004	
(t-statistics)	(-2.52)		(-0.06)	

This table reports the results of our multivariate regression of stock liquidity on the firm's four different asset classes. In Panel A, a full sample analysis is performed. In Panel B, the sample is split into Low *ACCSTD* and High *ACCSTD* sub-samples. The High *ACCSTD* sub-sample consists of firms from countries with accounting standards index that is above the median; while the Low *ACCSTD* sub-sample consists of firms from countries with accounting standards index that is below the median. The dependent variable is either *LIQ* (non-zero return proportion) or *lnBAS* (bid-ask spread). *WAL1* is equal to cash and cash equivalents divided by lagged value of Total Assets. *NONCASH-CA* is equal to total Current Assets minus Cash divided by lagged value of Total Assets. *FIXED ASSETS* is equal to total fixed assets divided by lagged value of Total

Assets. *INTANGIBLE* is equal to net intangible assets divided by lagged value of Total Assets. The firm-specific control variables included in the regression are *MV*, *BM*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *CAPEX*, *ROA*, and *BHAR*. All variables are defined in the Appendix. *ΔWAL1* Coefficient is equal to the difference in *WAL1* coefficient estimates for the High *ACCSTD* and Low *ACCSTD* sub-samples. *ΔNONCASH-CA*, *ΔFIXEDASSETS*, and *ΔINTANGIBLE* are defined similarly. All continuous variables are winsorized at the 1st and 99th percentiles. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term, firm-specific control variables, and Country (C), Industry (I), and Year (Y) fixed-effects are not reported. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.

Table 11

Asset-Stock liquidity Relations for Financially Constraint Firms

$$LIQ_i = \alpha_0 + \beta_1 WAL1_i + \beta_2 WAL1_i{*}FINCON_i + \beta_3 NONCASH\text{-}CA_i + \beta_4 NONCASH\text{-}CA{*}FINCON_i + \beta_5 FIXEDASSETS_i + \beta_6 FIXEDASSETS_i{*}FINCON_i + \beta_7 INTANGIBLE_i + \beta_8 INTANGIBLE_i{*}FINCON_i + \beta_9 FINCON_i + \gamma_j Controls_i + \theta_k Fixed\text{-}Effects_i + \varepsilon_i$$

	Model 1 (KZ)	Model 2 (WW)	Model 3 (KZ)	Model 4 (WW)
Variables	LIQ	LIQ	lnBAS	lnBAS
WAL1 (CASH)	2.757	16.311	-0.208	-0.542
	(5.06)	(6.26)	(-4.15)	(-3.77)
WAL1*FINCON	0.529	24.025	-0.057	-0.621
	(2.13)	(5.49)	(-5.83)	(-2.66)
NONCASH-CA	3.199	-7.599	-0.186	-0.441
	(7.00)	(-2.98)	(-7.93)	(-2.90)
NONCASH-CA*FINCON	0.175	-18.380	-0.012	-0.466
	(0.76)	(-4.22)	(-0.94)	(-1.84)
FIXED ASSETS	-0.317	-3.573	-0.007	-0.564
	(-0.63)	(-1.32)	(-0.35)	(-5.88)
FIXED ASSETS*FINCON	0.017	-5.299	-0.020	-0.939
	(0.08)	(-1.21)	(-1.53)	(-6.14)
INTANGIBLE	3.407	7.304	-0.200	1.044
	(6.81)	(1.35)	(-6.35)	(7.47)
INTANGIBLE*FINCON	0.235	6.563	-0.031	1.995
	(0.87)	(0.77)	(-2.67)	(8.27)
FINCON	-0.733	5.308	0.046	0.677
	(-4.18)	(1.29)	(5.12)	(3.01)
Firm Controls	Yes	Yes	Yes	Yes
Fixed Effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y
NObs	111,354	111,096	79,772	78,877
Adjusted R^2	0.47	0.48	0.74	0.74

This table reports the effects of Financial Constraint on different asset classes on stock liquidity. The dependent variable is *LIQ* (non-zero proportion) or *lnBAS* (bid-ask spread). *WAL1* is equal to cash and cash equivalents divided by lagged value of Total Assets. *NONCASH-CA* is equal to total Current Assets minus Cash divided by lagged value of Total Assets. *FIXED ASSETS* is equal to total fixed assets divided by lagged value of Total Assets. *INTANGIBLE* is equal to net intangible assets divided by lagged value of Total Assets. Two measures of financial constraint (*FINCON*) are used: (1) Model 1 and 3 report the results using KZ index (Kaplan and Zingales, 1997) as the measure of financial constraint; (2) Model 2 and 4 report the results using WW index (Whited and Wu, 2006) as the measure of financial constraint. The firm-specific control variables included in the regression are *MV*, *BM*, *PRICE*, *LEVERAGE*, *ACCRUAL*, *RETVOL*, *CAPEX*, *ROA*, and *BHAR*. All variables are defined in the Appendix. All continuous variables are winsorized at the 1st and 99th percentiles. NObs is the number of observations. To conserve space, the coefficient estimates for the Intercept term, and Country (C), Industry (I), and Year (Y) fixed-effects are not reported. Robust t-statistics based on two-way clustered at the firm and year level are reported in parentheses. Sample period is 1996-2010.