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Does the Relation between Information Quality and Capital Structure Vary with Cross-Country Institutional Differences?

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ABSTRACT: Prior research based on U.S. data finds that firms with better information quality raise more equity whereas firms with poorer information quality prefer to issue debt when they seek external financing. Little is known about whether the same conclusion holds outside the U.S. and how the country-level institutional environment influences the relation between information quality and capital structure choices. We examine the relation between accounting information quality (measured by earnings precision, accruals quality, and analyst consensus) and financial leverage across 24 countries and whether that relation varies systematically with country-level investor protection and financial orientation. We document a lower financial leverage for firms with better information quality. More importantly, we find a stronger relation between information quality and financial leverage in countries with weaker investor protection and more market-oriented economies. These cross-country results suggest that information quality is especially important in shaping a firm's capital structure decision when investor demand for information is greater.

Keywords: capital structure; financial leverage; information quality; investor protection; bank-oriented economy; market-oriented economy.

JEL Classifications: G32; G38; M41.

I. INTRODUCTION

The choice of capital structure is a critical managerial decision because it affects a firm's cost of capital and, consequently, its valuation. Therefore, it is not surprising that capital structure is one of the most important issues in corporate finance and has attracted considerable attention in academic research. Despite decades of theoretical development to explain the variation in capital structure across firms, our understanding of corporate capital structure remains incomplete (Graham and Leary 2011).

An important determinant of capital structure is the firm's information environment. Studies based on U.S. data find that firms with a better information environment raise more equity whereas firms with a poorer information environment issue more debt when they seek external financing (Chang, Dasgupta, and Hilary 2006, 2009; Bharath, Pasquariello, and Wu 2009). The results are consistent with information asymmetry being a key determinant of capital structure decisions. Our interest is in assessing the extent to which the relation between information quality and capital structure is influenced by institutional factors. Accordingly, we conduct our study in a cross-country setting, which is especially interesting because there is substantial variation in country-level factors that permits an analysis of the interplay between firm-level information quality and variation in institutional infrastructures. Our study builds on and extends international capital structure research that highlights the critical

role of a country's institutional environment in shaping a firm's capital structure (Rajan and Zingales 1995; Demirgüç-Kunt and Maksimovic 1999; Booth, Aivazian, Demirgüç-Kunt, and Maksimovic 2001; Bancel and Mittoo 2004; De Jong, Kabir, and Nguyen 2008; Fan, Twite, and Titman 2012).

The motivation of our study is twofold. First, in their influential study on international differences in capital structures, Rajan and Zingales (1995) argue that without testing the robustness of the findings outside the environment in which they were uncovered, it is hard to determine whether the empirical regularities are merely spurious correlations, let alone whether they support one theory or another. Given the continuing interest in linking information quality to capital structure choices in the literature and the primary focus of existing studies on the U.S. context, we believe that assessing the information quality-capital structure relation in non-U.S. contexts can significantly contribute to this line of research. To the extent that the results based on U.S. data generalize across a range of economic environments, they will provide greater assurance that information quality-capital structure choice relation is robust.

Second, and more important, we do not restrict ourselves to attempting to reproduce the results based on U.S. data in other countries; rather, we go deeper in an effort to understand the forces behind the observed relation between information quality and capital structure. Because institutional infrastructures vary substantially across countries, we can examine cross-country interactive effects to provide evidence on situations in which firm-level information quality is likely to be more important in capital structure decisions. In other words, the international setting affords us the opportunity to explore whether firm-level information quality plays the role of substitute or complement to a country's institutional infrastructure.

Information asymmetry is an integral part of the traditional theories of capital structure. Trade-off theory predicts that firms' optimal choice of capital structure involves balancing the tax advantages of debt financing against the costs of financial distress that arise from bankruptcy risks (Kraus and Litzenberger 1973) and agency costs (Jensen and Meckling 1976). According to pecking order theory, when information asymmetry between managers and outside investors is high, debt financing is preferred to equity financing. This is because mispricing of equity is more likely when external investors are less informed about the value of the firm and the expected payoffs to equity are more sensitive to firm value (Myers 1984). If high-quality disclosure reduces information asymmetry, then investors will impose lower adverse selection costs on new equity issuances by firms with a better information environment. Consequently, firms with higher information quality are more likely to use equity financing as opposed to debt financing and thus become less leveraged in their capital structure.

The effect of information quality in reducing information asymmetry may not be uniform across different institutional environments. We consider two country-level institutional characteristics in this study—the level of investor protection and the financial orientation of the economy. It remains an empirical question whether firm-level information quality plays the role of substitute or complement to country-level investor protection. In terms of complements, Daske, Hail, Leuz, and Verdi (2008) and Hope, Kang, Thomas, and Yoo (2009) find that IFRS adoption and the use of independent auditors are most beneficial in countries with stronger investor protection. By contrast, Lang, Lins, and Miller (2004) find that analysts are particularly important for firms with controlling families/managers in environments in which legal institutions provide poor protection for minority shareholders. Lang, Lins, and Maffett (2012) show that the positive relation between firm-level transparency and stock liquidity is more pronounced when country-level investor protection is weaker. Both studies suggest that firm-level information quality plays a substitute role when country-level investor protection is weaker. We conjecture that whether firm-level information quality is a substitute for or a complement to country-level investor protection likely depends on the specific context of managerial decision making. While our study will not resolve the debate, it sheds light on how firm-level information quality interacts with country-level investor protection in determining a firm's capital structure choice.

The financial orientation of the economy also has important implications for a firm's capital structure choice (Rajan and Zingales 1995; Antoniou, Guney, and Paudyal 2008). In a bank-oriented economy, private loans are the dominant source of capital and banks serve as the primary monitor and disciplinarian of the firm. Given greater bank power and relation, firm-level information quality plays a less important role in shaping a firm's capital structure decision. By contrast, in an economy where the bond and stock markets are the dominant sources of capital, financing is largely provided through arm's-length transactions and outside investors care more about information problems. Therefore, information quality becomes more relevant to their capital allocation decisions and, as a result, matters more to a firm's capital structure choice. However, a related study by Gao and Zhu (2015) finds that the sensitivity of financial leverage to firm-level information asymmetry is greater in countries with a more developed banking sector. They argue that bank development and strongly enforced bankruptcy codes make debt financing easier and equity financing more difficult and more sensitive to information asymmetry. While Gao and Zhu (2015) focus on banking sector development, we pay particular attention to the relative importance of the banking sector and the public equity/bond market in shaping a firm's capital structure choice.

Prior analytical research on disclosure typically characterizes information quality as the precision of the signal of firm value it provides, with a more precise (i.e., lower variance) signal being of higher quality (Verrecchia 2001). In line with this view, we measure information quality by *Earnings Precision, Accruals Quality,* and *Analyst Consensus* (discussed in detail in

Section III), all of which are commonly used in the literature (e.g., Dichev and Tang 2009; Lee and Masulis 2009; Francis, LaFond, Olsson, and Schipper 2005; Zhang 2006; Ng 2011).

Our measure of country-level investor protection follows La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), La Porta, Lopez-de-Silanes, and Shleifer (2006), and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008b). It captures various aspects of a country's legal system and tradition, such as its legal origin, rule of law, public enforcement, and anti-self-dealing. We measure the extent to which a country's economy is market oriented or bank oriented by two institutional features. The first measure is the size of public capital market at the country level. Intuitively, as an economy becomes more market oriented, the size of the public bond and equity markets relative to that of the private debt market should be larger. The second indicator is country-level bankruptcy resolution costs. Djankov, Hart, McLiesh, and Shleifer (2008a) develop several country-level measures of efficiency of debt enforcement and show that their measures are economically and statistically significant predictors of the development of the private debt markets.

Our sample size ranges between 40,345 and 95,531 firm-year observations depending on the measure of information quality, includes 24 countries, and spans the period 1996 to 2011. We find strong evidence that firms with higher information quality have lower financial leverage in their capital structure. This evidence is robust to controlling for endogeneity and consistent with better information quality reducing the level of information asymmetry between the firm and outside investors and mitigating the adverse selection costs associated with equity financing. In cross-country analyses, we find that the impact of information quality on capital structure is more pronounced in countries where investor protection is weaker and the economy is more market oriented. Overall, our results suggest that, in general, investors across different countries value information quality and are willing to supply more (and cheaper) equity financing for firms with better information quality. In addition, firm-level information quality appears to matter more in countries where investor protection is weaker and the economy is more market oriented.

Our study makes two important contributions to the literature. First, we extend research on the economic implications of information quality for capital structure choices (Bharath et al. 2009; Chang et al. 2006, 2009), which primarily focuses on U.S. firms. Our study provides strong international evidence on whether information quality is related to capital structure. Our finding that accounting information quality affects firms' capital structure across countries documents the robustness of this relation.

Second, and more important, our research is specifically designed to examine cross-country variation in the role of information quality in capital structure decisions. Our results show that firm-level information quality is especially important when country-level investor protection is weaker and the economy is more market oriented. This evidence is consistent with the reasoning that firm-level information quality matters more when investor demand for information is higher, because there are fewer alternative mechanisms in place to effectively mitigate adverse selection or financing is largely provided through arm's-length transactions. Our study adds to the debate about whether firm-level information quality is a complement to or a substitute for country-level investor protection in shaping a firm's capital structure decision. It implies that the answer is likely context specific. Furthermore, our result suggests that not only the absolute size of the banking sector, but also its relative importance to the public equity/bond market in a country affects the relation between information quality and capital structure.

This study proceeds in six sections. In the next section, we discuss prior literature relating information quality and capital structure, and how different institutional characteristics may affect this relation. We outline the measurement of accounting information quality and describe the empirical tests in Section III. We report and discuss our main results in Section IV, and the results of robustness checks in Section V. We present our conclusions in Section VI.

II. BACKGROUND AND HYPOTHESES

Information Quality and Financing Decisions

Prior U.S.-based studies find that the level of information asymmetry plays an important role in a firm's financing decisions (Bharath et al. 2009; Chang et al. 2006, 2009). Adverse selection can potentially lead firms to refuse equity financing and forgo profitable projects (Myers and Majluf 1984). Higher information quality effectively reduces the information asymmetry and thus affects the firm's capital structure choice.

The international finance literature incorporates country-level characteristics, in addition to firm-level determinants, to explain a firm's financial leverage (see, for example, Rajan and Zingales 1995; Booth et al. 2001). More recently, De Jong et al. (2008) analyze the importance of firm-specific and country-specific factors in the leverage choices of firms from 42 countries and find that firm-specific determinants of financial leverage differ across countries. Fan et al. (2012) further show that differences in country-level institutional factors are likely to have a first-order effect on capital structure choice. To the extent that the firm-level information effect is not subsumed by country-level institutional factors, the information

quality-capital structure relation found in the U.S. should continue to hold when country-specific factors are introduced in the analyses.

Institutional Interactions: Investor Protection

Information asymmetry between managers and outside investors creates a demand for the protection of investors' interests against expropriation by managers. A well-functioning legal system protects investors by enforcing their rights through shareholder litigation against managers who expropriate their wealth. Potential investors are more willing to provide external financing to firms if the legal system protects their rights than if investor protection laws and enforcement of those laws are lax (La Porta et al. 1998). Fan et al. (2012) find evidence consistent with stronger investor protection leading to a greater use of equity financing. Many studies also show that accounting quality is higher in countries with stronger investor protection (Leuz, Nanda, and Wysocki 2003; Ball, Kothari, and Robin 2000; Ball, Robin, and Wu 2003; Hung 2001; Bhattacharya, Daouk, and Welker 2003; Bushman, Piotroski, and Smith 2004; DeFond, Hung, and Trezevant 2007).

We are interested in the interplay between country-level investor protection and firm-level information quality. There are two potentially countervailing forces, depending on whether firm-level information quality is more likely a complement to or a substitute for country-level investor protection. On the one hand, prior research shows that the economic consequences of adopting high-quality accounting standards and hiring more independent auditors are larger in countries with stronger investor protection. For example, Daske et al. (2008) find that the capital-markets effects of mandatory IFRS adoption occur only in countries with stricter enforcement regimes. Hope et al. (2009) show that the cost of equity capital increases in excess auditor remuneration, but only in countries with stronger investor protection. Their result suggests that the bonding role of auditor choice in investors' capital allocation decisions is more prominent in countries with stronger investor protection. This line of research implies that higher firm-level information quality complements strong country-level investor protection.

On the other hand, several studies find evidence consistent with the substitution argument that the firm-specific information environment matters more in countries with weaker investor protection. For example, Lang et al. (2004) find that the interaction of analyst coverage and concentrated family/management control is positively related to firm value, but only among firms from countries with poor external shareholder protection. This suggests that analysts are particularly important for firms with controlling families/managers in environments where legal institutions provide poor protection for minority shareholders. Lang et al. (2012) show that firm-level transparency is positively related to liquidity, and the relation is more pronounced when country-level investor protection is weaker. Their results suggest that firm-level transparency is especially important when country-level investor protection is weaker.

The implication of firm-level information quality for capital structure likely varies based on country-level investor protection. However, the direction is not clear *ex ante*. If firm-level information quality is a complement to the country's institutional infrastructure, then the reduction of information asymmetry will be most beneficial in countries where there is substantial litigation exposure and strict law enforcement. By contrast, under the substitution argument, firm-level information quality matters more for private information acquisition in countries with weaker institutions and investors rely on private information acquisition as a substitute for weak country-level investor protection. As a result, the incremental benefit of higher information quality is more pronounced in countries with weaker investor protection, as there are fewer alternative mechanisms in place in such environments to effectively mitigate adverse selection associated with equity financing (e.g., external audit, regulatory screening, and shareholder litigation).

Because of the mixed evidence in the prior literature and the two potentially countervailing effects of information quality in the cross-country context, we do not offer a directional hypothesis. Instead, we leave it to our empirical testing to reject the following null hypothesis in favor of either of the two alternatives:

H1 (null): The relation between information quality and financial leverage is not affected by a country's level of investor protection.

Institutional Interactions: Bank versus Market Orientation

Besides the legal tradition, the financial orientation of the economy has important implications for a firm's capital structure choice. Among the G7 countries, Rajan and Zingales (1995) fail to find any systematic difference between the level of leverage in the bank-oriented countries (Japan, Germany, France, and Italy) and the market-oriented countries (U.S., U.K., and Canada). However, they argue that, in light of their evidence, the difference between bank-oriented countries and market-oriented countries appears to be reflected more in the choice between public financing (stock and bonds) and private financing (bank loans) than in the amount of leverage. Focusing on the G5 countries, Antoniou et al. (2008) examine how firms operating in market-oriented economies (U.S. and U.K.) and bank-oriented economies (France, Germany, and Japan) determine their capital

structure. They show that the effectiveness of firm-level determinants of financial leverage varies substantially across the two types of economies.

We explore the interplay between firm-level information quality and the financial orientation of the country in shaping a firm's financial leverage. In a bank-oriented economy, private loans are the dominant source of capital and banks serve as the primary monitor and disciplinarian of the firm. A close bank-firm relation can help effectively reduce information asymmetry. Hoshi, Kashyap, and Scharfstein (1991) present evidence from Japan that banks help alleviate the information problems that firms face in raising external capital. In the presence of greater bank power and relation, information quality is likely to be less important as a driver for financial leverage. By contrast, in an economy where the bond and stock markets are the dominant source of capital, financing is largely provided through arm's-length transactions and outside investors are more sensitive to information problems. Therefore, information quality becomes more relevant to their decisions to supply capital and, as a result, matters more to a firm's capital structure decision.

Consistent with this notion, Biddle and Hilary (2006) find that higher-quality accounting enhances investment efficiency by reducing information asymmetry between managers and outside suppliers of capital (i.e., capital investment is less sensitive to operating cash flow). They further show that this relation is more pronounced in market-oriented countries than in bank-oriented countries. However, Biddle and Hilary (2006) only compare the U.S. and Japan in their cross-country test, whereas we examine 24 countries and measure the degree of bank orientation for each country to enhance the power of our cross-country analysis.

Gao and Zhu (2015) provide a counterargument to the above reasoning. They find that financial leverage is more sensitive to firm-level information asymmetry in countries with a developed banking sector. They interpret their result as consistent with bank development and strongly enforced bankruptcy codes making debt financing easier and equity financing more difficult and more sensitive to information asymmetry. Gao and Zhu (2015) measure the significance of the banking sector as domestic credit provided by the banking sector scaled by gross domestic product (GDP). By contrast, we use the ratio of the aggregate size of the public bond and equity market to the size of the private debt market (discussed in detail in Section III) as a proxy for country-level financial orientation. While Gao and Zhu (2015) use an indirect measure as a proxy for the country-level institutional environments and do not consider the size/development of the public capital market, we use a more direct measure, which includes information about both public and private sources of capital, to identify a country's financial orientation. Gao and Zhu's (2015) measure of banking sector development and our proxy for financial orientation are likely to capture different aspects of a country's institutional environments, although both contain information about the size of the banking sector in a given country.

In light of the competing views of the moderating role of a country's financial orientation in linking information quality to financial leverage, we choose to let the data speak and do not offer a directional hypothesis. Our second hypothesis, stated in the null form, is as follows:

H2 (null): The relation between information quality and financial leverage is not affected by a country's financial orientation.

III. RESEARCH DESIGN

In this section, we first discuss the three measures of information quality used in our empirical analyses. We then detail the empirical models used for investigating the relation between information quality and capital structure across countries and how that relation may be influenced by institutional characteristics.

Measures of Information Quality

As noted by Verrecchia (2001), disclosure theories generally predict that investor uncertainty concerning firm value and adverse selection among investors are higher when the information is of lower precision (i.e., higher variance), *ceteris paribus*. We use three proxies of information quality that capture the precision of earnings signals—earnings precision, accruals quality, and analyst consensus.

The first proxy for information quality is *Earnings Precision,* which measures the volatility in reported earnings. Less volatile earnings are presumably more precise and, on average, are expected to be of higher quality. Dichev and Tang (2009) show that after controlling for a variety of economic characteristics, more precise earnings are associated with higher earnings predictability. Following Dichev and Tang (2009) and Ng (2011), we measure volatility of earnings as the standard deviation of earnings before extraordinary items deflated by average total assets over the most recent five years. We then multiply the standard deviation by minus one so that higher values of *Earnings Precision* reflect higher information quality.

The second proxy for information quality is *Accruals Quality,* a measure developed by Dechow and Dichev (2002). This measure reflects the extent to which working capital accruals map into realized cash flows from operations. The model relies on

the intuition that accruals involve estimates of cash flow and, therefore, are likely to contain (either intentional or unintentional) measurement error. Dechow and Dichev (2002) argue that the higher the estimation error, the lower the information quality, *ceteris paribus*.

We follow the method of Dechow and Dichev (2002) as modified by McNichols (2002) to measure accruals quality. We first estimate the following model annually for each industry group as defined in Frankel, Johnson, and Nelson (2002),[1] requiring at least ten firms in an industry with data in the current and prior four years:

$$CA_t = a + b_1 CFO_{t-1} + b_2 CFO_t + b_3 CFO_{t+1} + b_4 \Delta REV_t + b_5 PPE_t + e_t \quad (1)$$

where CA = total current accruals = Δcurrent assets − Δcurrent liabilities − Δcash + Δdebt in current liabilities; CFO = cash flow from operations = net income before extraordinary items − total accruals, where total accruals = current accruals − depreciation and amortization expense; ΔREV = change in total revenue from the prior to the current year; and PPE = property, plant, and equipment. Each variable is scaled by the average annual beginning and ending total assets.

We then calculate the standard deviation of the residuals e_{t-4} through e_t across the five years. A larger standard deviation reflects a greater portion of current accruals that are not explained by the model, indicating lower accruals quality, and therefore lower information quality. This measure has been widely used in prior studies (e.g., Lee and Masulis 2009; Francis et al. 2005; Ng 2011). Since a higher standard deviation represents lower information quality, we multiply the standard deviation by minus one so that a higher value of *Accruals Quality* reflects higher information quality.[2]

Our third proxy for information quality is *Analyst Consensus,* which is based on analysts' forecasts of annual earnings per share (EPS) for the current fiscal year. When investors rely on analysts' earnings forecasts to evaluate a firm, they are likely to regard forecasts as being more precise when there is greater agreement among analysts (Lang and Lundholm 1996; Barron, Kim, Lim, and Stevens 1998; Diether, Malloy, and Scherbina 2002; Zhang 2006). Similar to Zhang (2006) and Ng (2011), we compute *Analyst Consensus* as the negative of the inter-analyst standard deviation of EPS forecasts deflated by absolute value of earnings.[3]

Model Relating Financial Leverage and Information Quality

Consistent with prior research (e.g., Antoniou et al. 2008; De Jong et al. 2008; Fan et al. 2012), we use the following regression model to examine the relation between information quality and financial leverage across countries:

$$\begin{aligned} BLEV_t = {} & \alpha_0 + \alpha_1 InfoQuality_{t-1} + \alpha_2 Target_{t-1} + \alpha_3 Size_{t-1} + \alpha_4 Growth_{t-1} + \alpha_5 RET_{t-1} + \alpha_6 ROA_{t-1} + \alpha_7 Loss_{t-1} \\ & + \alpha_8 Tang_{t-1} + \alpha_9 Debt\_TS_{t-1} + \alpha_{10} Ndebt\_TS_{t-1} + \alpha_{11} BigN_{t-1} + \alpha_{12} INVPRO + \alpha_{13} CR + \alpha_{14} MARKET_{t-1} \\ & + \alpha_{15} BANKRUPT + \alpha_{16} TAX + \alpha_{17} DEV + \alpha_{18} INST\_OWN + \alpha_{19} FAM\_OWN + \alpha_{20} STATE\_OWN + Fixed\ Effects \\ & + \varepsilon_t \end{aligned} \quad (2)$$

We estimate Equation (2) with firm- and year-clustered standard errors to correct for cross-sectional and serial dependence (Petersen 2009).

The dependent variable, *BLEV,* is book leverage, defined as total debt divided by total assets. We use this more conventional leverage regression to examine the relevance of information quality for financing decisions. The advantage of this model specification is that we can control for a conventional set of variables that also explains cross-sectional variation in financing decisions, which has survived many tests. In the international context, it is probably even more critical to take into account the confounding factors (such as institutional environment) that may also affect financing decisions, information quality, and their relation.

We are primarily interested in α_1, the coefficient on *InfoQuality* (proxied by *Earnings Precision, Accruals Quality,* or *Analyst Consensus*). The detailed definitions of the variables are provided in Table 1. The information quality measures, as well

[1] Following Frankel et al. (2002), industry membership is determined by the following SIC codes: agriculture (0100–0999), mining and construction (1000–1999, excluding 1300–1399), food (2000–2111), textiles and printing/publishing (2200–2799), chemicals (2800–2824, 2840–2899), pharmaceuticals (2830–2836), extractive (2900–2999, 1300–1399), durable manufacturers (3000–3999, excluding 3570–3579 and 3670–3679), transportation (4000–4899), retail (RET, 5000–5999), services (7000–8999, excluding 7370–7379), and computers (COM, 3570–3579, 3670–3679, 7370–7379).

[2] As a robustness check, we use an alternative proxy for accruals quality proposed by Wysocki (2008). This alternative measure is estimated in two steps. First, we estimate two variations of the Dechow and Dichev (2002) model. The first model is a regression of working capital accruals on current cash flows. The second model is the original Dechow and Dichev (2000) model that regresses working capital accruals on lagged, current, and future cash flows. We then compute the standard deviation of the residuals of each model from the year $t-5$ to year $t-1$. Accruals quality is defined as the ratio of the standard deviation of the residuals from the simpler model to standard deviation of the residuals from the full model. The results are qualitatively the same using this alternative proxy for accruals quality.

[3] We require that at least three analysts cover the firm and that forecasts are made within 90 days before the announcement of actual earnings. Our results are similar when we do not impose restrictions on the forecast period. Additionally, our results are robust when we deflate EPS by stock price at the beginning of the fiscal year instead of by absolute value of actual earnings.

TABLE 1

Definition of Variables

Variables		Definitions
Dependent Variables		
$BLEV_t$	=	book leverage in year t, defined as total debt divided by total assets;
$MLEV_t$	=	market leverage in year t, defined as total debt divided by market value of assets;
$BLLEV_t$	=	book leverage in year t, defined as long term debt divided by total assets;
$NBALEV_t$	=	book leverage in year t, defined as total debt divided by net assets, where net assets is total assets minus total liabilities;
Test Variables		
$InfoQuality_t$	=	proxies for information quality in year t, defined below;
$Earnings\ Precision_t$	=	degree of volatility in reported earnings over the five years;
$Accruals\ Quality_t$	=	metric developed by Dechow and Dichev (2002) and modified by McNichols (2002), see Section III for details;
$Analyst\ Consensus_t$	=	negative of the inter-analyst standard deviation of EPS forecasts deflated by absolute value of earnings;
Firm-Level Controls		
$Target_t$	=	industry median leverage in year t, where industry is as defined in Frankel et al. (2002). Leverage is the sum of long-term debt and debt in current liabilities, divided by total assets;
$Size_t$	=	natural logarithm of total assets in year t;
$Growth_t$	=	market value to book value ratio in year t, computed as total assets minus book value of equity plus market value of equity, divided by total assets;
RET_t	=	holding period stock return over the fiscal year t;
ROA_t	=	return on assets in year t, defined as the ratio of income before extraordinary items to total assets;
$Loss_t$	=	indicator variable equal to 1 if income before extraordinary items in year t is less than 0, 0 otherwise;
$Tang_t$	=	tangible assets in year t, defined as net property, plant, and equipment divided by total assets;
$Debt\_TS_t$	=	current income tax divided by pre-tax income in year t;
$Ndebt\_TS_t$	=	non-tax shield in year t, measured as sum of depreciation and research and development expenditure divided by total assets;
$BigN_t$	=	indicator variable equal to 1 if the auditor is a Big N auditor in year t, and 0 otherwise;
$TREND$	=	time trend variable, defined as the current fiscal year minus the first fiscal year in our sample (i.e., fiscal year 1996);
Country-Level Variables		
$COMMON$	=	indicator variable equal to 1 if the legal origin is common, 0 otherwise (La Porta et al. 1998);
$RULE$	=	rule of law index as reported in La Porta et al. (1998). It is the assessment of the law and order tradition in the country produced by the country risk rating agency International Country Risk (ICR). Scale from 0 to 10, with higher scores for greater tradition for law and order;
$PUBENF$	=	index of public enforcement measured as the arithmetic mean of: (1) Supervisor characteristics index; (2) Rule-making power index; (3) Investigative powers index; (4) Orders index; and (5) Criminal index (La Porta et al. 2006);
$ANTISELF$	=	anti-self-dealing index, which is a measure of legal protection of minority shareholders against expropriation by corporate insiders (from Djankov et al. 2008b);
$INVPRO$	=	the first principal component of $COMMON$, $RULE$, $PUBENF$, and $ANTISELF$;
CR	=	index aggregating different creditor rights, as reported in La Porta et al. (1998) and updated in Djankov, McLeish, and Shleifer (2007). The index ranges from 0 to 4, with higher value indicating higher creditor protection;
$PUBDEBT_t$	=	public bond market capitalization divided by GDP in year t (data from Beck et al. 2009);
$SMCAP_t$	=	stock market capitalization divided by GDP in year t (data from Beck et al. 2009);
$PTEDEBT_t$	=	private bonds and private credit by deposit money banks and other financial institutions divided by GDP in year t (data from Beck et al. 2009);
$MARKET_t$	=	the aggregate size of the public bond and equity market divided by the size of the private debt market $((PUBDEBT_t + SMCAP_t)/PTEDEBT_t)$;
$TIME$	=	time to resolve the insolvency process (data from Djankov et al. 2008a);
$COST$	=	costs to complete the insolvency proceeding, expressed as a percentage of the bankruptcy estate at the time of entry to the bankruptcy (data from Djankov et al. 2008a);

(continued on next page)

TABLE 1 (continued)

Variables		Definitions
INEFF	=	present value of the terminal value of the firm after bankruptcy costs, expressed in percentages from 0 to 100, with higher values indicating greater efficiency. We transform the index by subtracting the index from 100 so that a higher value indicates greater inefficiency (data from Djankov et al. 2008a);
BANKRUPT	=	the first principal component of TIME, COST, and *INEFF;*
TAX	=	estimate of the Miller (1977) tax ratio equal to (1 − [(after all tax value of dollar dividends)/(after all tax value of dollar interest)]) calculated using statutory tax rates (data from Fan et al. 2012);
DEV	=	an indicator that equals 1 for a developed country, and 0 for a developing country. A country is considered to be developing if its equity market is not included in the Morgan Stanley Capital International database (Hail and Leuz 2006);
INST_OWN	=	mean country-level institutional ownership from Ferreira, Massa, and Matos (2010);
FAM_OWN	=	percent of firms controlled by the family shareholder in each country, where the cutoff used to define effective control is 10 percent (data from La Porta, Lopez-de-Silanes, and Shleifer 1999); and
STATE_OWN	=	percent of firms controlled by the state in each country, where the cutoff used to define effective control is 10 percent (data from La Porta et al. 1999).

as the control variables, are lagged one period with respect to the capital structure measurement period.[4] Using lagged variables is consistent with our expectation that information quality affects the cost of information asymmetry, which in turn affects the firm's financial leverage. If information quality reduces information asymmetry between the firm and outside investors, then we expect firms with higher information quality to use more equity financing, resulting in lower financial leverage. Accordingly, we expect α_1 to be negative.

Following prior literature, we include an array of potential determinants of a firm's capital structure decision in Equation (2). We include industry median leverage (*Target*) because prior studies find that firms strive to maintain target capital structures (Rajan and Zingales 1995; Hovakimian, Opler, and Titman 2001; Frank and Goyal 2009). We control for firm size, calculated as the natural logarithm of total assets (*Size*), because prior studies (e.g., Fama and French 2002; Frank and Goyal 2003) document that larger firms are more likely to use debt than equity. Diamond and Verrecchia (1991) show that reducing information asymmetry can lower the cost of capital because larger investors are more willing to supply capital for more liquid stocks and larger firms are likely to be more incentivized to disclose high-quality information because they can benefit more. We also control for growth, measured as the market-to-book ratio (*Growth*). The relation between growth and leverage is ambiguous (Frank and Goyal 2009). We include market-to-book ratio to control for a variety of effects, including a firm's investment and growth opportunities and its relative valuation level. Firms with high growth or good investment opportunities tend not to need the disciplinary role of debt to curtail problems associated with excess free cash flow and thus have lower leverage. However, high-growth firms may suffer more from information asymmetry problems and hence are more likely to use debt than equity (Myers and Majluf 1984). Thus, there is no clear prediction on the relation between market-to-book ratio and financial leverage.

We control for stock returns (*RET*) because they affect leverage. Static trade-off models predict that a low market leverage ratio encourages a firm to issue debt in an attempt to move toward the optimum ratio. Such behavior will raise book leverage following high stock returns. Market timing theory, on the other hand, makes the opposite prediction that book leverage ratio falls following high stock returns as firms issue more equity. We also control for operating performance as prior studies show that operating performance is associated with leverage. However, the direction of association between operating performance and leverage is ambiguous. Theories on the trade-off between debt and bankruptcy risks and the presence of non-debt tax shields suggest that leverage increases with profitability (Barclay and Smith 1999; Hovakimian et al. 2001; Fama and French 2002; DeAngelo and Masulis 1980). However, dynamic trade-off theories predict a negative relation between operating performance and leverage (Fischer, Heinkel, and Zechner 1989; Strebulaev 2007; Hennessy and Whited 2005). To measure operating performance, we use return on assets (*ROA*), and a dummy variable (*Loss*) that equals 1 if the firm reports a loss, and 0 otherwise.

We control for the nature of a firm's assets by including tangible assets (*Tang*) and expect firms with more tangible assets to use more debt, as these assets can be used as collateral (Frank and Goyal 2009). The incentive to take on debt should increase

[4] Most of our country-level controls are constant across time; hence these variables are not lagged.

with the firm's marginal tax rate arising from the tax deductibility of interest expense. We use the effective tax rate paid by the firm to proxy for debt-related tax shield (*Debt_TS*). Firms can also use non-debt tax shields such as depreciation, research and development, or carryforwards. Both theoretical models and empirical evidence are ambiguous on the relation between non-debt-related tax shield and leverage. For example, Bradley, Jarrell, and Kim (1984) provide evidence of a positive relation, whereas DeAngelo and Masulis (1980) and Kim and Sorensen (1986) provide evidence of a negative relation. We measure non-debt-related tax shield (*Ndebt_TS*) by the magnitude of depreciation and research and development expenditure. We control for auditor quality (*BigN*) because Chang et al. (2009) find a significant relation between auditor quality and the debt-equity issuance decision.

We include several country-level factors that affect financial leverage based on prior studies (Fan et al. 2012), such as investor protection (*INVPRO*), creditor protection (*CR*), financial orientation (*MARKET* and *BANKRUPT*), tax system (*TAX*), economic development (*DEV*), and ownership structure (*INST_OWN, FAM_OWN,* and *STATE_OWN*). According to Fan et al. (2012), these country-level institutional variables explain a significant portion of variation in a firm's financial leverage decision.

Endogeneity and Reverse Causality

A challenge for our study is assessing causality. The test outlined in Equation (2) is based on the premise that higher information quality reduces information asymmetry between the firm and outside investors, resulting in more equity financing and less debt financing. However, a firm's capital structure decision may be a function of unobservable omitted variables (an endogeneity issue) or of the underlying driver that shapes accounting information quality (a reverse causality issue). We note that it is inappropriate to draw strong conclusions about causality because the results of estimating Equation (2) are based on associations. That being said, we adopt several approaches to alleviate the concern that our results are an artifact of endogeneity or reverse causality.

First, we include a wide range of controls that capture many of the reasons that information quality might be endogenous. For example, if Big N clients have better information quality and are more likely to issue equity as opposed to debt (Chang et al. 2009), then inclusion of *BigN* in Equation (2) should mitigate this concern. If high-growth firms have lower information quality and are less likely to issue equity as opposed to debt, then inclusion of *Growth* should mitigate this concern. Similarly, our primary analyses use industry and year fixed effects. They control for industry and time period factors that affect both information quality and financial leverage.

Second, instead of studying a contemporaneous relation between financial leverage and information quality, we use lagged measures of information quality in Equation (2). Focusing on a lead-lag relation helps alleviate the concern that our results simply reflect an unobservable variable that drives both financial leverage and information quality. Third, given that the association between information quality and financial leverage varies across countries in a predictable way, it is difficult to argue that the causality can be reversed and yet the cross-country results still hold. For example, the theory would need to explain why a lower level of financial leverage results in an especially high level of information quality in countries where investor protection is weaker.

Nonetheless, we also attempt to address the potential endogeneity concern by adopting a change specification of Equation (2) to infer the direction of causality for the relation between information quality and financial leverage. In addition, prior studies (Jung, Kim, and Stulz 1996; Berger, Ofek, and Yermack 1997) suggest that the financial leverage ratio represents the cumulative result of separate decisions from prior years. As a result, cross-sectional tests based on a single aggregate of different decisions are likely to have low power. Such a concern can be mitigated by estimating a changes specification of Equation (2) as well:

$$\begin{aligned}\Delta BLEV_t = {} & \alpha_0 + \alpha_1 \Delta InfoQuality_{t-1} + \alpha_2 \Delta Target_{t-1} + \alpha_3 \Delta Size_{t-1} + \alpha_4 \Delta Growth_{t-1} + \alpha_5 \Delta RET_{t-1} + \alpha_6 \Delta ROA_{t-1} \\ & + \alpha_7 \Delta Tang_{t-1} + \alpha_8 \Delta Debt\_TS_{t-1} + \alpha_9 \Delta Ndebt\_TS_{t-1} + Country\text{-}Level\ Controls + Fixed\ Effects + \varepsilon_t \end{aligned} \quad (3)$$

The above specification allows us to use each firm as its own control and is less susceptible to endogeneity problems than the levels model (Berger et al. 1997).[5]

Effects of Institutional Factors on the Financial Leverage-Information Quality Relation

Our cross-country analyses call for country-level investor protection and financial orientation measures. A country's legal system protects outside investors by giving them the rights to discipline corporate insiders and to enforce contracts. La Porta et al. (1998) report that the extent of legal protection of outside investors varies across countries. We use the following four measures to assess the strength of country-level investor protection: legal origin (*COMMON*) and rule of law index (*RULE*) from La Porta et al. (1998), public enforcement index (*PUBENF*) from La Porta et al. (2006), and anti-self-dealing index

[5] We do not include $\Delta Loss$ and $\Delta BigN$ in Equation (3) because only 1 percent of sample observations have non-zero values of $\Delta Loss$ and $\Delta BigN$. Nevertheless, untabulated results show that including $\Delta Loss$ and $\Delta BigN$ in Equation (3) does not qualitatively affect our conclusion.

(*ANTISELF*), a measure of legal protection of minority shareholders against expropriation by corporate insiders, from Djankov et al. (2008b). Investor protection is stronger in common law countries and in countries where the rule of law, public enforcement, and anti-self-dealing indexes are higher. These variables capture various aspects of a country's legal system and tradition. Because these four variables are highly correlated with each other, we capture their commonality by using a composite index for investor protection (*INVPRO*), which is the first principal component of *COMMON, RULE, PUBENF,* and *ANTISELF*. A higher value of *INVPRO* indicates stronger investor protection.[6] Detailed descriptions of these variables and other country-level institutional variables are provided in Table 1.

We assess the extent to which a country's economy is market oriented or bank oriented by examining two institutional characteristics. First, we consider the relative size of the public bond and equity markets to the size of the private debt market (*MARKET*) in a given country for each year. Intuitively, as an economy is more market (bank) oriented, the size of the public bond and equity markets (private debt market) is likely to be relatively larger. Data on the size of private debt, public bond, and public equity markets for each country are from Beck, Demirgüç-Kunt, and Levine (2009).[7]

The second institutional feature that we consider is country-level bankruptcy resolution costs. Djankov et al. (2008a) examine the (in)efficiency of debt enforcement around the world. They find that on average, bankruptcy or insolvency procedures across all countries are extremely time consuming, costly, and inefficient. They show that their measures of efficiency of debt enforcement are economically and statistically significant predictors of the development (*Size*) of private debt markets across countries. Using data from Djankov et al. (2008a), we take into account the time involved to resolve the insolvency process (*TIME*), costs to complete the insolvency proceeding (*COST*), and overall bankruptcy inefficiency (*INEFF*) to measure country-level bankruptcy resolution costs.[8] To capture their commonality, we extract the first principal component of *TIME, COST,* and *INEFF,* with higher values indicating greater bankruptcy resolution costs and lower efficiency of debt enforcement (*BANKRUPT*). Because the efficiency of debt enforcement is positively related to the development (size) of the private debt market, we expect bank (market)-oriented countries to have low (high) values of *BANKRUPT*.

To test H1, we augment Equation (2) with the interaction between *InfoQuality* and *INVPRO*. The coefficient on the interaction term measures the difference in the effect of information quality on capital structure between firms in stronger and weaker investor protection environments. If information quality matters more (less) to capital structure decisions in countries with stronger investor protection, then we expect the negative relation between information quality and financial leverage to be more (less) pronounced for countries with stronger *INVPRO,* and the coefficient of the interaction term to be significantly negative (positive).

To test H2, we augment Equation (2) with the interaction between *InfoQuality* and *MARKET* (or *BANKRUPT*). The coefficient on the interaction term measures the difference in the effect of information quality on capital structure between firms in market-oriented economies and firms in bank-oriented economies. If information quality matters more (less) to capital structure decisions in market-oriented economies than in bank-oriented economies, then we expect the coefficient on the interaction term to be significantly negative (positive).

IV. EMPIRICAL RESULTS

Sample

Our initial sample consists of the 49 countries listed in La Porta et al. (1998). We obtain financial data for the listed firms in various countries based on their country of incorporation from the Compustat Global database,[9] and analyst forecast data from the International I/B/E/S database for the period 1996 to 2011. As with most previous studies on capital structure, we exclude firms in the financial sector (SIC 60–69) because their leverage levels are to a large extent dependent on government regulations. We identify 40 countries with sufficient firm-level variables. The country-level institutional variables are based on the data from related studies (e.g., La Porta et al. 1998; La Porta et al. 2006; Djankov et al. 2008a; Djankov et al. 2008b). The number of sample countries is reduced because some of the institutional variables, such as the governance variables, institutional, family, and state ownership, are not available for many countries. Hence, the final number of sample countries used in this study is 24. We use three distinct samples corresponding to our three proxies for information quality.[10] The first

[6] As a sensitivity check, we also use the minority investor protection index from the World Bank (2015) database as an alternative proxy for investor protection. Beginning in 2006, the World Bank provides the index annually. The index ranges from 0 to 10, with higher values indicating greater protection to minority investors. The results are similar with this alternative proxy for investor protection.

[7] These data are updated by Beck et al. (2009) every year and are made publicly available on the website: http://go.worldbank.org/X23UD9QUX0

[8] Djankov et al. (2008a) develop a measure of efficiency for bankruptcy. The index ranges from 0 to 100, with higher values indicating greater efficiency. We transform the index by subtracting the index from 100 so that a higher value indicates greater inefficiency.

[9] In an untabulated sensitivity test, we control for the exchange listing of our sample firms in the regression analyses because disclosure requirements (and thus information quality and availability) may vary across different stock exchanges. Our results are qualitatively unchanged.

[10] We truncate each continuous variable in the regression model at its 1st and 99th percentiles to limit the effect of extreme values on our inferences.

sample includes 95,531 firm-years (17,028 firms) that have financial data available to compute our first information quality proxy, *Earnings Precision,* and the control variables. The second sample comprises 67,804 firm-years (13,308 firms) with financial data available for computing our second information quality proxy, *Accruals Quality*. This sample is smaller because of the more restrictive data requirement to compute *Accruals Quality*. The third sample, which uses *Analyst Consensus* as the proxy for information quality, consists of 42,387 firm-years (8,808 firms). The smaller sample size is primarily due to the limited coverage of firms in the International I/B/E/S database.

Descriptive Statistics

Table 2 reports descriptive statistics for the country-level institutional variables. We note that there is wide variation in institutional variables across countries. For example, investor protection (*INVPRO*) is highest in fast-growing economies such as Hong Kong and Singapore, but is substantially lower in some European countries such as Austria and Germany. Other institutional variables also exhibit considerable variation across countries.

In Table 3, we report descriptive statistics of firm characteristics by country. We report the means of the variables based on the largest sample when information quality is measured by *Earnings Precision* (95,531 firm-year observations), except for the variables *Accruals Quality* and *Analyst Consensus,* which are based on 67,804 and 42,387 firm-year observations, respectively. There is significant variation in the number of firm-year observations across countries due to differences in capital market development, country size, and availability of complete financial data. Firms from the U.S. and Japan represent a significant proportion of the total sample (around 45.9 percent and 24.1 percent, respectively). The dependent variable in our study is book leverage, measured as the debt-to-assets ratio. Portugal has the highest debt-to-assets ratio (40 percent), followed by Greece (37 percent). We also observe considerable variation across countries in our three proxies for information quality.

We report Pearson correlations between the country-level variables in Panel A of Table 4. As expected, *INVPRO* is significantly associated with its components, *COMMON, PUBENF,* and *ANTISELF* (except *RULE*). The two proxies for capital market development, however, are not significantly correlated. Panel B of Table 4 reports the correlations between firm-level variables used in the regression. The three measures of information quality (*Earnings Precision, Accruals Quality,* and *Analyst Consensus*) are positively correlated with each other, suggesting that they capture the same underlying construct to some extent. However, the correlations are of only moderate economic significance (the correlations range between 0.05 and 0.52), suggesting that each measure captures a different dimension of information quality and, hence, supports our choice of using all three measures to triangulate our results and strengthen the robustness of our findings. Consistent with our prediction, all three measures of information quality are negatively associated with financial leverage (*BLEV*) at the 1 percent level. The univariate results suggest that, across the 24 countries covered in our study, firms with higher information quality have lower financial leverage in their capital structure.

Relation between Financial Leverage and Information Quality

Table 5 confirms that the negative association between information quality and financial leverage, a result from prior studies based on U.S. data, continues to hold in our international sample. Panel A reports the results for the levels regression with year and industry fixed effects. Across all three measures of information quality (*Earnings Precision, Accruals Quality,* and *Analyst Consensus*), we find strong and consistent results that financial leverage decreases in information quality.

Turning to the control variables, firm size (*Size*) and tangible assets (*Tang*) are positively and significantly associated with leverage, consistent with the evidence reported in Fama and French (2002) and Frank and Goyal (2003, 2009). The positive and significant coefficient on the industry median level of debt (*Target*) is consistent with prior evidence suggesting that firms strive to maintain a target capital structure (Hovakimian et al. 2001). The coefficient estimate for *Growth* is significantly negative (except when we measure information quality using *Accruals Quality*), consistent with the evidence in Frank and Goyal (2009). The significantly negative coefficient on return on assets (*ROA*) and the positive coefficient on the loss dummy variable (*Loss*) indicate that profitable firms are less likely to issue debt, consistent with the predictions of the dynamic trade-off model that leverage is negatively related to profitability because firms passively accumulate profits (Kayhan and Titman 2007).

Interestingly, the coefficient on *Debt_TS* is negative and significant, inconsistent with the incentive for firms to take on more debt when they have a higher marginal tax rate. MacKie-Mason (1990) notes that most studies fail to find plausible or significant tax effects on financing behavior because the leverage ratios are the cumulative result of years of separate decisions and tax shields have a negligible effect on the marginal tax rate for most firms. Antoniou et al. (2008) also note that the implication of tax on capital structure choice depends upon the tax policy objectives, especially when the tax system is designed to favor the retention of earnings against dividend payout, or *vice versa*.[11]

[11] For instance, the German tax system favors payout against retention, discouraging internal equity. On the other hand, the French system encourages retention, reducing the need for external finance.

TABLE 2

Institutional Characteristics of Sample Countries

Panel A: Country-Level Variables *COMMON* to *MARKET*

Country	*COMMON*	*RULE*	*PUBENF*	*ANTISELF*	*INVPRO*	*CR*	*PUBDEBT*	*SMCAP*	*PTEDEBT*	*MARKET*
Australia	1	10	0.85	0.79	1.43	3	19.60	103.07	140.27	0.89
Austria	0	10	0.17	0.21	−1.10	3	34.03	22.91	149.51	0.38
Belgium	0	10	0.13	0.54	−0.63	2	75.70	62.30	120.64	1.18
Canada	1	10	0.9	0.65	1.26	1	59.94	103.44	132.77	1.27
Denmark	0	10	0.27	0.47	−0.58	3	50.11	58.60	241.77	0.53
Finland	0	10	0.48	0.46	−0.35	1	20.90	108.31	91.80	1.53
France	0	8.98	0.69	0.38	−0.24	0	51.34	75.51	137.75	0.93
Germany	0	9.23	0.15	0.28	−1.02	3	36.71	45.45	154.69	0.54
Greece	0	6.18	0.46	0.23	−0.74	1	58.06	59.67	84.80	1.86
Hong Kong	1	8.22	0.83	0.96	1.67	4	13.47	373.59	167.70	2.35
Ireland	1	7.8	0.02	0.79	0.47	1	25.24	41.46	280.63	0.34
Italy	0	8.33	0.69	0.39	−0.22	2	87.51	36.52	115.45	1.13
Japan	0	8.98	0	0.48	−0.88	2	125.98	74.83	175.32	1.28
Korea	0	5.35	0.54	0.46	−0.29	3	34.41	65.55	141.68	0.69
Mexico	0	5.35	0.15	0.18	−1.17	0	13.19	26.26	27.37	1.43
The Netherlands	0	10	0.29	0.21	−0.97	3	44.20	98.03	214.84	0.72
Norway	0	10	0.25	0.44	−0.65	2	15.31	42.07	91.70	0.63
Portugal	0	8.68	0.5	0.49	−0.28	1	38.61	39.17	191.01	0.47
Singapore	1	8.57	0.88	1	1.79	3	32.52	165.71	113.29	1.77
Spain	0	7.8	0.29	0.37	−0.71	2	39.84	74.95	161.37	0.83
Sweden	0	10	0.38	0.34	−0.66	1	42.24	105.55	119.77	1.36
Switzerland	0	10	0.23	0.27	−0.94	1	24.37	220.80	193.17	1.27
U.K.	1	8.57	0.67	0.93	1.44	4	34.72	135.62	165.89	1.08
U.S.	1	10	0.88	0.65	1.24	1	54.29	127.46	153.20	1.20

Panel B: Country-Level Variables *TIME* to *STATE_OWN*

Country	*TIME*	*COST*	*INEFF*	*BANKRUPT*	*TAX*	*DEV*	*INST_OWN*	*FAM_OWN*	*STATE_OWN*
Australia	0.58	0.08	12.20	−0.66	0.00	1	0.10	0.05	0.11
Austria	0.92	0.18	22.00	0.39	0.03	1	0.15	0.70	0.18
Belgium	0.92	0.04	9.20	−0.83	0.03	1	0.50	0.05	0.13
Canada	0.75	0.04	6.80	−0.99	0.18	1	0.30	0.00	0.52
Denmark	2.50	0.09	23.30	0.75	0.12	1	0.35	0.20	0.21
Finland	0.92	0.04	7.60	−0.88	0.01	1	0.10	0.35	0.47
France	1.89	0.09	45.90	1.06	0.17	1	0.20	0.20	0.27
Germany	0.92	0.08	43.00	0.39	−0.01	1	0.10	0.30	0.24
Greece	1.92	0.09	46.20	1.09	−0.16	0	0.65	0.30	0.15
Hong Kong	0.63	0.09	11.70	−0.59	0.17	1	0.70	0.05	0.12
Ireland	0.42	0.09	10.10	−0.75	0.17	1	0.15	0.00	0.32
Italy	1.17	0.22	54.70	1.69	−0.01	1	0.20	0.50	0.19
Japan	0.58	0.04	4.50	−1.15	0.35	1	0.10	0.05	0.08
Korea	1.50	0.04	11.90	−0.44	0.25	0	0.35	0.15	0.16
Mexico	1.83	0.18	27.40	1.04	0.03	0	1.00	0.00	0.34
The Netherlands	1.42	0.01	5.10	−0.83	0.34	1	0.20	0.05	0.24
Norway	0.92	0.01	8.20	−1.01	0.00	1	0.25	0.40	0.23
Portugal	2.00	0.09	17.70	0.32	0.17	0	0.50	0.25	0.13
Singapore	0.58	0.01	3.90	−1.31	0.00	1	0.45	0.45	0.12
Spain	1.00	0.15	18.00	0.12	0.18	1	0.25	0.45	0.16
Sweden	1.00	0.09	14.00	−0.32	0.22	1	0.55	0.10	0.38
Switzerland	3.00	0.04	39.60	1.16	0.26	1	0.40	0.00	0.29

(continued on next page)

TABLE 2 (continued)

Country	*TIME*	*COST*	*INEFF*	*BANKRUPT*	*TAX*	*DEV*	*INST_OWN*	*FAM_OWN*	*STATE_OWN*
U.K.	0.50	0.06	7.70	−0.95	0.15	1	0.05	0.00	0.24
U.S.	2.00	0.07	14.20	0.10	0.31	1	0.20	0.00	0.75

The table provides the country-level variables for 24 countries. *PUBDEBT, SMCAP, PTEDEBT,* and *MARKET* are the mean values over the sample period.
The definitions of the variables are defined in Table 1.

Consistent with DeAngelo and Masulis (1980), we find that non-debt tax shield (*Ndebt_TS*) is negatively associated with leverage. Prior stock return (*RET*) is positively and significantly associated with leverage, which is consistent with the prediction of static trade-off theory and inconsistent with market timing theory. Consistent with Chang et al. (2009), the negative and significant coefficient on *BigN* indicates that firms audited by high-quality auditors tend to use less debt. Finally, similar to Fan et al. (2012), we show that country-level factors have a significant impact on firms' financial leverage decisions. For example, firms in countries with stronger investor (creditor) protection rely more on equity (debt) financing; firms in developed countries and in countries that have a higher tax preference for debt have higher financial leverage; firms in countries that attract more institutional investors have lower financial leverage; and firms in countries with significant state ownership use more debt financing as opposed to equity financing.

TABLE 3

Mean Values of Variables Used in the Regression Models by Country

Country	*Firm-Years*	*BLEV*	*Earnings Precision*	*Accruals Quality*	*Analyst Consensus*	*Target*	*Size*	*Growth*	*RET*	*ROA*	*Loss*	*Tang*	*Debt_TS*	*Ndebt_TS*	*BigN*
Australia	3,394	0.21	−0.11	−0.05	−0.11	0.15	5.07	1.67	0.09	−0.03	0.34	0.36	0.07	0.05	0.49
Austria	191	0.29	−0.04	−0.04	−0.17	0.22	6.11	1.14	0.63	0.03	0.17	0.30	0.12	0.06	0.51
Belgium	299	0.25	−0.05	−0.05	−0.19	0.24	6.20	1.41	0.15	0.02	0.26	0.27	0.12	0.08	0.61
Canada	1,071	0.25	−0.19	−0.07	−0.13	0.16	4.12	2.10	0.44	−0.17	0.60	0.49	0.03	0.12	0.73
Denmark	417	0.30	−0.04	−0.03	−0.19	0.28	7.37	1.49	0.09	0.03	0.19	0.36	0.17	0.07	0.81
Finland	452	0.25	−0.06	−0.04	−0.20	0.22	6.12	1.49	0.32	0.03	0.22	0.27	0.14	0.09	0.68
France	3,315	0.23	−0.04	−0.04	−0.16	0.21	6.02	1.37	0.38	0.02	0.21	0.19	0.17	0.06	0.37
Germany	3,106	0.22	−0.06	−0.04	−0.18	0.18	5.99	1.32	0.24	0.01	0.24	0.27	0.19	0.08	0.42
Greece	297	0.37	−0.04	−0.05	−0.15	0.27	5.84	1.33	0.16	0.02	0.30	0.37	0.11	0.03	0.26
Hong Kong	688	0.21	−0.08	−0.05	−0.14	0.18	7.89	1.39	0.47	0.00	0.25	0.27	0.07	0.03	0.65
Ireland	86	0.26	−0.05	−0.04	−0.09	0.21	6.26	1.36	0.27	0.00	0.41	0.32	0.13	0.04	0.84
Italy	792	0.27	−0.04	−0.04	−0.20	0.24	7.36	1.25	0.08	0.00	0.29	0.25	0.20	0.05	0.66
Japan	23,065	0.26	−0.03	−0.02	−0.15	0.22	10.96	1.08	0.11	0.01	0.22	0.32	0.34	0.05	0.05
Korea	1,173	0.28	−0.04	−0.03	−0.14	0.25	13.55	0.98	0.05	0.02	0.18	0.41	0.00	0.04	0.49
Mexico	217	0.27	−0.03	−0.04	−0.20	0.22	9.89	1.17	0.62	0.05	0.13	0.51	0.08	0.05	0.61
The Netherlands	641	0.25	−0.05	−0.03	−0.17	0.21	5.96	1.45	0.24	0.03	0.19	0.27	0.15	0.06	0.82
Norway	366	0.31	−0.08	−0.02	−0.24	0.29	7.36	1.62	0.14	0.01	0.28	0.41	0.10	0.06	0.91
Portugal	48	0.40	−0.04	−0.05	−0.30	0.21	7.34	1.14	0.37	0.00	0.20	0.35	0.13	0.06	0.65
Singapore	2,198	0.22	−0.06	−0.05	−0.14	0.18	5.47	1.25	0.15	0.02	0.22	0.33	0.14	0.04	0.66
Spain	493	0.25	−0.03	−0.03	−0.17	0.23	8.50	1.41	−0.02	0.04	0.10	0.39	0.15	0.05	0.79
Sweden	971	0.22	−0.08	−0.04	−0.18	0.16	7.44	1.62	0.12	0.00	0.30	0.24	0.15	0.07	0.70
Switzerland	1,114	0.22	−0.04	−0.03	−0.15	0.22	6.54	1.52	0.08	0.04	0.13	0.34	0.16	0.06	0.66
U.K.	7,245	0.21	−0.07	−0.04	−0.09	0.17	5.10	1.60	0.19	0.02	0.21	0.34	0.19	0.06	0.70
U.S.	43,892	0.27	−0.10	−0.05	−0.05	0.21	5.69	1.89	0.31	−0.04	0.34	0.31	0.18	0.10	0.80
Overall	95,531	0.26	−0.06	−0.04	−0.16	0.21	7.01	1.42	0.24	0.01	0.25	0.33	0.14	0.06	0.62

The table provides the mean values of the firm-level variables used in the regression based on the largest possible sample with information quality measured by *Earnings Precision* (n = 95,531). The mean values of *Accruals Quality* and *Analyst Consensus* are based on smaller samples with n = 67,804 and n = 42,387, respectively.

TABLE 4

Pearson Correlation Matrix

Panel A: Correlations between Institutional Characteristics of Sample Countries

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. *COMMON*	1.00																		
2. *RULE*	0.08	1.00																	
3. *PUBENF*	**0.61**	0.05	1.00																
4. *ANTISELF*	**0.87**	0.08	**0.56**	1.00															
5. *INVPRO*	**0.94**	0.08	**0.80**	**0.92**	1.00														
6. *CR*	0.27	0.11	0.14	0.41	0.31	1.00													
7. *SMCAP*	0.48	0.13	0.45	**0.52**	**0.55**	0.33	1.00												
8. *PUBDEBT*	−0.22	0.10	−0.12	−0.14	−0.18	−0.09	−0.27	1.00											
9. *PTEDEBT*	0.20	0.27	−0.21	0.22	0.09	0.28	0.12	0.07	1.00										
10. *MARKET*	0.26	−0.18	0.43	0.29	0.36	−0.04	**0.67**	0.03	−0.47	1.00									
11. *TIME*	−0.44	−0.07	−0.09	**−0.52**	−0.40	−0.41	−0.05	−0.04	0.07	−0.08	1.00								
12. *COST*	−0.19	−0.32	−0.08	−0.31	−0.22	−0.14	−0.29	0.02	−0.16	−0.10	0.08	1.00							
13. *INEFF*	−0.42	−0.23	−0.05	**−0.52**	−0.39	−0.30	−0.20	0.12	−0.17	−0.02	**0.51**	**0.56**	1.00						
14. *BANKRUPT*	−0.46	−0.26	−0.09	**−0.59**	−0.44	−0.37	−0.23	0.05	−0.11	−0.08	**0.70**	**0.68**	**0.92**	1.00					
15. *TAX*	0.08	0.17	−0.04	0.05	0.04	−0.02	0.26	0.22	**0.54**	−0.14	0.15	−0.29	−0.37	−0.22	1.00				
16. *DEV*	0.29	**0.76**	0.05	0.30	0.25	0.28	0.28	0.12	0.32	−0.04	−0.38	−0.17	−0.19	−0.31	0.18	1.00			
17. *INST_OWN*	0.25	0.25	0.24	−0.03	0.17	**−0.49**	0.01	−0.11	−0.09	0.05	0.19	−0.07	−0.07	0.02	0.25	0.16	1.00		
18. *FAM_OWN*	−0.13	**−0.50**	−0.02	−0.14	−0.11	−0.28	0.20	−0.22	−0.41	**0.51**	0.33	0.19	0.12	0.27	−0.18	**−0.59**	−0.10	1.00	
19. *STATE_OWN*	−0.37	0.02	−0.05	−0.27	−0.27	0.15	−0.33	−0.02	−0.24	−0.19	−0.11	0.38	0.28	0.24	**−0.52**	0.04	−0.30	−0.18	1.00

Panel B: Correlations between Firm-Level Variables Used in the Regression Analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. *BLEV*	1.00													
2. *Earnings Precision*	**−0.02**	1.00												
3. *Accruals Quality*	**−0.02**	**0.52**	1.00											
4. *Analyst Consensus*	**−0.08**	**0.06**	**0.05**	1.00										
5. *Target*	**0.27**	**0.24**	**0.18**	**−0.05**	1.00									
6. *Size*	**0.10**	**0.44**	**0.46**	**−0.13**	**0.24**	1.00								
7. *Growth*	**−0.09**	**−0.32**	**−0.20**	**0.17**	**−0.19**	**−0.24**	1.00							
8. *RET*	0.00	**−0.11**	**−0.08**	**−0.04**	**−0.04**	**−0.08**	**0.19**	1.00						
9. *ROA*	**−0.07**	**0.59**	**0.30**	**0.16**	**0.13**	**0.26**	**−0.21**	**−0.02**	1.00					
10. *Loss*	**0.12**	**−0.39**	**−0.27**	**−0.25**	**−0.12**	**−0.26**	**0.07**	**0.05**	**−0.55**	1.00				
11. *Tang*	**0.27**	**0.15**	**0.24**	**−0.04**	**0.34**	**0.13**	**−0.13**	**−0.04**	**0.07**	**−0.05**	1.00			
12. *Debt_TS*	**−0.04**	**0.12**	**0.09**	**0.02**	**0.05**	**0.12**	**−0.02**	**−0.02**	**0.11**	**−0.23**	−0.01	1.00		
13. *Ndebt_TS*	**−0.07**	**−0.43**	**−0.22**	−0.01	**−0.25**	**−0.26**	**0.33**	**0.03**	**−0.54**	**0.27**	**−0.07**	**−0.06**	1.00	
14. *BigN*	**−0.02**	**−0.03**	**−0.03**	**0.17**	**0.02**	**−0.23**	**0.12**	**0.03**	**0.03**	**−0.02**	**0.04**	**−0.03**	**0.11**	1.00

All correlations that are bold are statistically significant at the 0.01 level or better (two-tailed).
Panel A reports the Pearson correlations between the institutional variables for 24 countries. Panel B reports the Pearson correlations between the firm-level variables used in the regression analysis, based on the largest possible sample when information quality is measured by *Earnings Precision* (n = 95,531), except for *Accruals Quality* and *Analyst Consensus,* which are based on n = 67,804 and n = 42,387, respectively.
The detailed definitions of the variables are provided in Table 1.

Panel B of Table 5 reports the results for the changes regression. Because the results are consistent with those reported in Panel A, we do not repeat the discussion for brevity. Overall, in our international sample, we find strong evidence that a firm's information quality is negatively related to its financial leverage.

Effects of Institutional Factors on the Financial Leverage—Information Quality Relation (H1 and H2)

In this section, we report the results of investigating the implications of institutional characteristics for the relation between information quality and financial leverage. Table 6 summarizes the results for testing H1 when the institutional variable is

TABLE 5

Relation between Information Quality and Capital Structure

Panel A: Levels Regression

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.066	−6.15***	−0.219	−12.42***	−0.125	−7.58***
InfoQuality	−0.041	−4.70***	−0.519	−14.97***	−0.061	−9.54***
Target	0.475	35.06***	0.470	20.49***	0.470	24.54***
Size	0.012	37.75***	0.017	35.42***	0.020	42.86***
Growth	−0.006	−10.41***	−0.002	−1.36	−0.013	−14.78***
RET	0.003	5.16***	0.001	0.80	0.003	3.04***
ROA	−0.088	−14.83***	−0.069	−3.24***	−0.161	−10.63***
Loss	0.059	33.41***	0.068	15.87***	0.037	10.47***
Tang	0.183	55.47***	0.228	38.00***	0.183	38.92***
Debt_TS	−0.006	−6.49***	−0.008	−5.82***	−0.007	−4.54***
Ndebt_TS	−0.168	−15.62***	−0.105	−4.13***	−0.231	−12.50***
BigN	−0.007	−4.38***	−0.013	−5.02***	−0.010	−3.93***
INVPRO	−0.007	−5.58***	−0.009	−4.62***	−0.020	−11.41***
CR	0.001	0.53	0.014	7.38***	0.004	2.54***
MARKET	−0.018	−10.49***	−0.027	−8.14***	−0.020	−8.75***
BANKRUPT	−0.008	−5.02***	−0.029	−9.58***	−0.018	−8.90***
TAX	0.076	6.54***	0.042	1.90*	0.237	14.73***
DEV	0.036	6.62***	0.042	3.93***	0.065	5.47***
INST_OWN	−0.075	−13.12***	−0.052	−5.20***	−0.087	−10.84***
FAM_OWN	0.005	0.75	0.041	4.13***	0.014	1.56
STATE_OWN	0.007	0.84	0.085	5.70***	0.038	3.05***
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	16.71		6.36		25.86	
No. of Firm-Years	95,531		67,804		42,387	

Panel B: Changes Regression

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.006	−1.43	−0.001	−0.18	−0.003	−0.49
Δ*InfoQuality*	−0.101	−8.40***	−0.101	−2.69***	−0.002	−3.69***
Δ*Target*	0.358	23.50***	0.388	15.36***	0.369	15.96***
Δ*Size*	0.038	16.94***	0.039	11.26***	0.033	9.54***
Δ*Growth*	−0.004	−7.02***	−0.001	−1.91*	−0.005	−7.89***
Δ*RET*	0.000	3.86***	0.000	2.28**	0.000	9.10***
Δ*ROA*	−0.099	−21.85***	−0.037	−4.99***	−0.123	−12.76***
Δ*Tang*	0.129	15.14***	0.184	14.03***	0.105	7.36***
Δ*Debt_TS*	0.000	1.61	0.000	1.12	0.000	2.54***
Δ*Ndebt_TS*	−0.044	−3.74***	0.009	0.54	−0.128	−8.26***
INVPRO	0.000	0.55	−0.002	−2.17**	−0.002	−1.92*
CR	0.000	0.18	0.001	1.01	0.002	2.75***
MARKET	−0.003	−4.58***	−0.007	−5.27***	−0.006	−5.86***
BANKRUPT	−0.001	−1.04	−0.000	−0.28	−0.003	−2.61***
TAX	0.019	3.52***	0.026	2.96***	−0.005	−0.66
DEV	−0.001	−0.66	0.007	1.94*	−0.006	−1.16
INST_OWN	−0.016	−6.18***	−0.018	−4.48***	−0.010	−2.66***
FAM_OWN	−0.002	−0.64	−0.004	−0.95	0.012	2.60***
STATE_OWN	−0.001	−0.17	−0.007	−1.14	0.018	3.08***

(continued on next page)

TABLE 5 (continued)

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	8.98		4.98		9.17	
No. of Firm-Years	92,583		66,449		40,345	

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed), respectively.
Leverage is measured as book leverage (*BLEV*), and information quality is measured as earnings precision, or accruals quality, or analyst consensus. Sample period for the analysis is from 1996 to 2011. The table reports the results of the regression models that examine the relation between information quality and financial leverage. Panel A reports the results for the levels regression, which is specified below:

$$BLEV_t = \alpha_0 + \alpha_1\, InfoQuality_{t-1} + \alpha_2 Target_{t-1} + \alpha_3 Size_{t-1} + \alpha_4 Growth_{t-1} + \alpha_5 RET_{t-1} + \alpha_6 ROA_{t-1} + \alpha_7 Loss_{t-1} + \alpha_8 Tang_{t-1} + \alpha_9 Debt\_TS_{t-1} + \alpha_{10} Ndebt\_TS_{t-1} + \alpha_{11} BigN_{t-1} + \alpha_{12} INVPRO + \alpha_{13} CR + \alpha_{14} MARKET_{t-1} + \alpha_{15} BANKRUPT + \alpha_{16} TAX + \alpha_{17} DEV + \alpha_{18} INST\_OWN + \alpha_{19} FAM\_OWN + \alpha_{20} STATE\_OWN + Fixed\ Effects + \varepsilon_t.$$

Panel B reports results for the above model, but with the changes specification, for all three proxies of information quality.
Detailed definitions of the variables are provided in Table 1.

measured by *INVPRO*. Panel A reports the results for the levels regression and Panel B reports the results for the changes regression for the three proxies of information quality. The regressions are run with year and industry fixed effects.

In Panel A of Table 6 the coefficients on all three proxies for information quality remain significantly negative. More important, we find that the coefficients on the interaction term, *InfoQuality* $*$ *INVPRO*, are all positive and significant. These results indicate that outside investors value information quality more when the protection afforded them is weaker. Panel B shows similar results for the changes regression. The coefficients on the proxies for information quality are significantly negative in all three models. The negative relation between information quality and financial leverage is attenuated for firms in the countries with stronger investor protection, as evidenced by the significantly positive coefficient on Δ*InfoQuality* $*$ *INVPRO*. Overall, the results reported in Table 6 are consistent with firm-level information quality playing a substitute role for country-level investor protection in shaping a firm's capital structure decision.

H2 examines how firm-level information quality affects capital structure decisions in countries with different financial orientation. We use two proxies, *MARKET* and *BANKRUPT,* to capture the extent of financial orientation and report the corresponding results in Table 7 and Table 8, respectively.

Table 7 shows the results when we measure country-level financial orientation by *MARKET*. Panel A and Panel B report the results for the levels and changes regressions, respectively. Consistent with our expectation, the coefficients on the proxies for information quality are all significantly negative. More important, we find that the coefficients on *InfoQuality* $*$ *MARKET* and Δ*InfoQuality* $*$ *MARKET* are negative and significant, suggesting that investors value information quality more when the economy is more market oriented.

Table 8 reports the results when we measure country-level financial orientation by *BANKRUPT*. Panel A and Panel B report the results for the levels and changes regressions, respectively. The overall picture that emerges from this table is very similar to that from Table 7. Specifically, the coefficients on the proxies for information quality are significantly negative in five out of the six models (main effects). The coefficients on *InfoQuality* $*$ *BANKRUPT* and Δ*InfoQuality* $*$ *BANKRUPT* are negative and significant (except when information quality is measured by *Accruals Quality*). Overall, the results presented in Table 7 and Table 8 are consistent with the notion that firm-level information quality matters more to financial leverage in market-oriented economies than in bank-oriented economies.

V. SENSITIVITY ANALYSES

We conduct several sensitivity tests to assess the robustness of our findings. The results using different proxies for information quality are similar so, in the interest of parsimony, we only discuss the results based on the *Analyst Consensus* proxy and the institutional characteristics based on *INVPRO* and *MARKET*. To conserve space, we only report the coefficient estimates and significance levels for the variables of interest in Table 9.

Removing U.S. and Japanese Firms from the Analyses

Observations from the U.S. and Japan comprise about 70 percent of the total sample. To alleviate concerns that our results may be driven by the predominance of observations from these two countries, we repeat the analyses after dropping U.S. and

TABLE 6

Effect of Investor Protection on the Relation between Information Quality and Capital Structure

Panel A: Levels Regression—Investor Protection Measured by *INVPRO*

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.068	−6.31***	−0.225	−12.78***	−0.122	−7.38***
InfoQuality	−0.113	−8.03***	−0.686	−15.34***	−0.065	−10.27***
*InfoQuality * INVPRO*	0.065	6.22***	0.152	4.37***	0.039	6.79***
INVPRO	−0.011	−8.14***	−0.016	−6.46***	−0.025	−13.29***
Target	0.474	34.97***	0.465	20.27***	0.468	24.43***
Size	0.012	38.17***	0.017	35.44***	0.020	42.25***
Growth	−0.006	−10.34***	−0.002	−1.36	−0.013	−14.96***
RET	0.003	5.15***	0.001	0.83	0.003	2.77***
ROA	−0.091	−15.20***	−0.069	−3.25***	−0.161	−10.61***
Loss	0.059	32.84***	0.068	15.74***	0.038	10.87***
Tang	0.183	55.66***	0.228	38.10***	0.183	39.06***
Debt_TS	−0.006	−6.27***	−0.007	−5.74***	−0.007	−4.57***
Ndebt_TS	−0.166	−15.47***	−0.103	−4.06***	−0.230	−12.48***
BigN	−0.008	−4.88***	−0.013	−5.28***	−0.009	−3.86***
CR	0.001	0.96	0.013	7.03***	0.003	2.19**
MARKET	−0.018	−10.7***1	−0.027	−8.29***	−0.018	−8.06***
BANKRUPT	−0.008	−5.09***	−0.028	−9.30***	−0.019	−8.97***
TAX	0.070	5.94***	0.051	2.32**	0.234	14.54***
DEV	0.035	6.54***	0.044	4.07***	0.065	5.49***
INST_OWN	−0.070	−12.14***	−0.046	−4.65***	−0.080	−9.92***
FAM_OWN	0.003	0.52	0.043	4.26***	0.015	1.62
STATE_OWN	0.007	0.92	0.085	5.70***	0.036	2.89***
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	16.75		16.39		25.96	
No. of Firm-Years	95,531		67,804		42,387	

Panel B: Changes Regression—Investor Protection Measured by *INVPRO*

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.006	−1.46	0.001	0.17	−0.002	−0.28
Δ*InfoQuality*	−0.157	−9.38***	−0.062	−1.81*	−0.005	−5.10***
Δ*InfoQuality * INVPRO*	0.051	3.86***	0.077	2.91***	0.003	3.21***
INVPRO	0.000	0.57	−0.002	−2.77***	−0.002	−1.76*
Δ*Target*	0.357	23.50***	0.360	16.25***	0.370	15.83***
Δ*Size*	0.038	16.97***	0.038	12.78***	0.033	9.45***
Δ*Growth*	−0.004	−7.03***	−0.003	−4.42***	−0.005	−7.86***
Δ*RET*	0.000	3.86***	0.000	2.84***	0.000	9.04***
Δ*ROA*	−0.098	−21.67***	−0.033	−4.97***	−0.124	−12.66***
Δ*Tang*	0.129	15.18***	0.176	16.46***	0.105	7.34***
Δ*Debt_TS*	0.000	1.62	0.000	0.92	0.000	2.30**
Δ*Ndebt_TS*	−0.043	−3.70***	0.003	0.24	−0.128	−8.27***
CR	0.000	0.21	0.002	2.54***	0.002	2.75***
MARKET	−0.003	−4.58***	−0.006	−5.13***	−0.006	−5.90***
BANKRUPT	0.001	1.05	0.001	1.17	−0.003	−2.83***
TAX	0.019	3.54***	0.019	2.36**	−0.005	−0.61
DEV	−0.001	−0.68	0.006	1.85*	0.007	1.35

(continued on next page)

TABLE 6 (continued)

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
INST_OWN	−0.016	−6.26***	−0.010	−2.78***	−0.010	−2.52***
FAM_OWN	−0.002	−0.64	−0.005	−1.05	0.013	2.80***
STATE_OWN	0.000	−0.10	−0.001	−0.27	0.018	2.97***
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	9.00		5.37		9.16	
No. of Firm-Years	92,583		66,449		40,345	

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed), respectively.
The table reports the results when the institutional variable is measured by investor protection, *INVPRO*. Panel A reports the results for the levels regression:

$$BLEV_t = \alpha_0 + \alpha_1 InfoQuality_{t-1} + InfoQuality_{t-1} * INVPRO + \gamma INVPRO + \psi Firm\ and\ Country\ Controls + Fixed\ Effects + \varepsilon_t.$$

Panel B reports results for the above regression, but with a change specification, for all three proxies of information quality. The country and firm controls are the same set of controls as in Table 5.
Detailed definitions of the variables are provided in Table 1.

Japanese firms. As shown in Panel A of Table 9, our main results are robust to removing U.S. and Japanese firms from the sample.

Alternative Measures of Financial Leverage

Several alternative definitions of financial leverage have been proposed in prior research. Most studies adopt some form of a debt ratio, whether measured by book value or market value and whether measured by total debt or only long-term debt. In our main analyses, we measure financial leverage as total debt divided by total book value of assets. Market values reflect forward-looking information whereas book values reflect historical accounting information. As demonstrated by Barclay, Morellec, and Smith (2006), there is no inherent reason why a forward-looking measure should be the same as a backward-looking measure. Harris and Raviv (1991) argue that different measures of financial leverage may produce different results and can also affect the interpretation of the results. Rajan and Zingales (1995) and Booth et al. (2001) also show that the determinants of capital structure can be quite sensitive to the choice of the leverage measure. To address this issue, we consider three alternative definitions of financial leverage: (1) the ratio of total debt to total market value of assets (*MLEV*), (2) the ratio of long-term debt to total book value of assets (*BLLEV*), and (3) the ratio of total debt to net assets (*NBALEV*). The results of these sensitivity checks, which we report in Panels B, C, and D of Table 9, are qualitatively the same as the main results reported in Section IV.

Controlling for Liquidity

Lang et al. (2012) document greater liquidity for firms with higher information quality, and Bharath et al. (2009) document that liquidity is negatively associated with leverage. Therefore, to ensure that our results are not simply driven by this omitted variable, we include an additional control for liquidity in our models. To measure liquidity, we follow Lang et al. (2012) and define the zero-return metric (*ZERORET*) as the number of zero-return trading days over the firm's fiscal year divided by the total trading days of the year. A manifestation of illiquidity will be infrequent trading reflected in days without price movements. As such, higher values correspond to greater illiquidity. We collect the price data from the Compustat Global database and compute *ZERORET* for firms with at least 150 trading days in a year. We are only able to compute *ZERORET* for 21 percent of our sample firms. Because of the substantial drop in the sample size, we do not include this variable in the main tests, but instead relegate the analysis to this section. The results are reported in Panel E of Table 9. Consistent with prior studies, we find that *ZERORET* is positively and significantly associated with financial leverage. More important, our main results continue to hold after controlling for liquidity.

Controlling for Time Trend

Because our sample period spans 1996 to 2011, we examine whether there is a time trend effect over the 16 years. Following Cotter, Tuna, and Wysocki (2006) and Kanagaretnam, Lee, Lim, and Lobo (2016), we include a time trend

TABLE 7

Effect of Public Capital Market Size on the Relation between Information Quality and Capital Structure

Panel A: Levels Regression—Relative Size of Public Capital Market (*MARKET*)

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.063	−5.87**	−0.203	−11.41***	−0.120	−7.24***
InfoQuality	−0.043	−4.93***	−0.520	−15.01***	−0.059	−9.07***
*InfoQuality * MARKET*	−0.065	−2.89***	−0.455	−5.37***	−0.018	−1.68*
MARKET	−0.021	−10.91***	−0.043	−10.27***	−0.017	−7.27***
Target	0.473	34.83***	0.461	20.10***	0.485	25.65***
Size	0.012	37.71***	0.017	35.09***	0.020	43.28***
Growth	−0.006	−10.50***	−0.002	−1.42	−0.013	−14.76***
RET	0.003	5.14***	0.001	0.76	0.003	2.67***
ROA	−0.088	−14.79***	−0.069	−3.24***	−0.163	−10.73***
Loss	0.059	33.36***	0.068	15.81***	0.037	10.50***
Tang	0.183	55.49***	0.228	38.18***	0.182	38.81***
Debt_TS	−0.006	−6.47***	−0.007	−5.79***	−0.007	−4.43***
Ndebt_TS	−0.168	−15.60***	−0.104	−4.09***	−0.231	−12.56***
BigN	−0.007	−4.32***	−0.013	−4.96***	−0.009	−3.83***
INVPRO	−0.007	−5.34***	−0.008	−3.91***	−0.019	−11.21***
CR	0.001	0.69	0.013	6.78***	0.005	3.35***
BANKRUPT	−0.007	−4.89***	−0.028	−9.29***	−0.020	−9.54***
TAX	0.081	6.86***	0.028	1.25	0.225	13.66***
DEV	0.036	6.55***	0.039	3.58***	0.067	5.63***
INST_OWN	−0.075	−13.22***	−0.053	−5.35***	−0.108	−13.21***
FAM_OWN	0.002	0.34	0.028	2.81***	0.020	2.21**
STATE_OWN	0.004	0.54	0.076	5.05***	0.035	2.80***
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	16.72		16.43		25.86	
No. of Firm-Years	95,531		67,804		42,387	

Panel B: Changes Regression—Relative Size of Public Capital Market (*MARKET*)

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.008	−2.09**	0.000	0.09	−0.002	−0.30
ΔInfoQuality	−0.104	−3.02***	−0.020	−0.64	−0.008	−3.74***
*ΔInfoQuality * MARKET*	−0.044	−2.19**	−0.221	−2.54***	−0.002	−2.11**
MARKET	−0.001	−1.06	−0.006	−5.17***	−0.006	−5.77***
ΔTarget	0.363	23.98***	0.361	16.28***	0.371	15.79***
ΔSize	0.039	17.15***	0.038	12.82***	0.033	9.40***
ΔGrowth	−0.004	−6.94***	−0.003	−4.41***	−0.005	−7.85***
ΔRET	0.000	3.94***	0.000	2.89***	0.000	9.01***
ΔROA	−0.096	−22.10***	−0.033	−4.97***	−0.124	−12.63***
ΔTang	0.127	14.85***	0.176	16.46***	0.106	7.35***
ΔDebt_TS	0.000	1.66*	0.000	0.90	0.000	2.31**
ΔNdebt_TS	−0.042	−3.65***	0.004	0.25	−0.128	−8.26***
INVPRO	0.001	1.19	−0.002	−2.75***	−0.002	−1.80*
CR	0.000	0.13	0.002	2.57***	0.002	2.64***
BANKRUPT	0.000	0.56	−0.001	−1.12	−0.003	−2.80***
TAX	0.016	2.85***	0.019	2.32**	−0.005	−0.68
DEV	0.000	0.07	0.006	1.80*	0.006	1.26

(continued on next page)

TABLE 7 (continued)

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
INST_OWN	−0.013	−4.97***	−0.010	−2.79***	−0.009	−2.46**
FAM_OWN	0.002	0.52	−0.004	−0.96	0.012	2.70***
STATE_OWN	0.001	0.22	−0.002	−0.38	0.017	2.83***
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	9.29		5.38		9.16	
No. of Firm-Years	92,583		66,449		40,345	

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed), respectively.
The table reports the results when the institutional variable is measured by the size of the public bond and equity market relative to the private debt market, *MARKET*. Panel A reports the results for the levels regression:

$$BLEV_t = \alpha_0 + \alpha_1 InfoQuality_{t-1} + InfoQuality_{t-1} * MARKET + \gamma MARKET + \psi Firm\ and\ Country\ Controls + Fixed\ Effects + \varepsilon_t.$$

Panel B reports results for the above regression, but with a change specification, for all three proxies of information quality. The country and firm controls are the same set of controls as in Table 5.
Detailed definitions of the variables are provided in Table 1.

variable (*TREND*) to control for the possibility that financial leverage may have increased over time.[12] The results are reported in Panel F of Table 9. The coefficient on *TREND* is positive and significant, suggesting an increasing reliance of debt financing over time. More important, our main results still hold after controlling for this time trend effect.

Other Robustness Checks

Although we include several firm-level control variables, as well as year and industry fixed effects in our main tests, it is still possible that there are some omitted (and correlated) variables. However, adding more control variables comes at the cost of reducing the sample size, and thus a trade-off exists between sample size (and hence generalizability and power) and "model completeness." As a robustness check, we include two additional control variables to Equation (2). First, we control for corporate dividend payout policy (*DIVIDEND*) because Lewellen (2006) and Chang et al. (2009) show that dividend policy is associated with financing decisions. Second, we include the level of cash holdings (*CASH*) as an additional control variable. Hovakimian (2004) finds that firms with more cash reserves are more likely to rely on equity financing, as they are better able to time equity issuance to avoid costs of adverse selection and perceived underpricing. Hence, firms with more cash should have less leverage in their capital structure. Our untabulated results indicate that *DIVIDEND* is significantly and positively—while *CASH* is significantly and negatively—associated with financial leverage. Our cross-country results are also robust to controlling for firms' dividend payout and cash resources.

Finally, a potential concern with using *Analyst Consensus* as a proxy for information quality is that the measure is based on analysts' forecast dispersion, which is a function of the number of analysts following the firm, which in turn is a function of expected external financing activities by the firm. Moreover, the extent of analysts' consensus likely also depends on the length of time between the forecast made by analysts and the actual release of earnings by the firm (i.e., the forecast horizon). To address this concern, we add the number of analysts following the firm (*NUMEST*) and the forecast horizon (*HORIZON*) to the model. The (untabulated) results indicate that *NUMEST* is negatively, while *HORIZON* is only marginally, associated with financial leverage. Nevertheless, our cross-country results continue to hold after including these two variables.

VI. SUMMARY AND CONCLUSIONS

Prior research suggests that information quality is systematically related to capital structure decisions. However, the evidence is primarily based on studies of the U.S. market, and little is known about the relation between information

[12] *TREND* is a variable that captures the time index in a given year; it equals 0 for 1996, 1 for 1997, 2 for 1998, etc. This variable controls for the exogenous increase in the dependent variable (financial leverage), which is not explained by other variables in the regression.

TABLE 8

Effect of Country-Level Bankruptcy Resolution Costs on the Relation between Information Quality and Capital Structure

Panel A: Levels Regression—Bankruptcy Costs Based on *BANKRUPT*

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.067	−6.24***	−0.219	−12.37***	−0.122	−7.36***
InfoQuality	−0.048	−4.28***	−0.519	−14.42***	−0.054	−7.67***
*InfoQuality * BANKRUPT*	−0.030	−1.93*	−0.001	−0.02	−0.017	−2.25**
BANKRUPT	−0.008	−5.16***	−0.029	−8.48***	−0.021	−9.06***
Target	0.475	34.99***	0.470	20.42***	0.470	24.49***
Size	0.012	38.48***	0.017	35.41***	0.020	42.75***
Growth	−0.007	−11.00***	−0.002	−1.36	−0.013	−14.83***
RET	0.004	5.85***	0.001	0.80	0.003	3.01***
ROA	−0.129	−18.22***	−0.069	−3.24***	−0.162	−10.63***
Loss	0.055	29.21***	0.068	15.86***	0.037	10.53***
Tang	0.187	56.43***	0.228	38.01***	0.183	38.91***
Debt_TS	−0.006	−6.38***	−0.008	−5.82***	−0.007	−4.52***
Ndebt_TS	−0.230	−19.83***	−0.105	−4.13***	−0.231	−12.50***
BigN	−0.005	−3.01***	−0.013	−5.01***	−0.010	−3.93***
INVPRO	−0.006	−5.08***	−0.009	−4.62***	−0.020	−11.39***
CR	0.001	1.11	0.014	7.36***	0.004	2.67***
MARKET	−0.018	−10.41***	−0.027	−8.15***	−0.019	−8.45***
TAX	0.087	7.43***	0.042	1.91*	0.237	14.71***
DEV	0.038	7.11***	0.043	3.93***	0.064	5.39***
INST_OWN	−0.078	−13.62***	−0.052	−5.19***	−0.085	−10.54***
FAM_OWN	0.002	0.39	0.041	4.12***	0.016	1.71*
STATE_OWN	0.002	0.20	0.085	5.72***	0.037	3.02***
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	17.51		16.36		25.87	
No. of Firm-Years	95,531		67,804		42,387	

Panel B: Changes Regression—Bankruptcy Costs Based on *BANKRUPT*

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Intercept	−0.004	−0.94	−0.001	−0.18	−0.006	−0.76
ΔInfoQuality	−0.007	−0.56	−0.101	−2.57***	−0.018	−1.91*
*ΔInfoQuality * BANKRUPT*	−0.048	−2.46***	−0.003	−0.04	−0.016	−1.65*
BANKRUPT	−0.001	−1.36	−0.000	−0.28	−0.002	−1.45
ΔTarget	0.350	23.32***	0.388	15.35***	0.395	14.69***
ΔSize	0.040	17.33***	0.039	11.26***	0.040	8.60***
ΔGrowth	−0.004	−6.94***	−0.001	−1.91*	−0.005	−7.39***
ΔRET	0.000	4.38***	0.000	2.28**	0.000	8.47***
ΔROA	−0.096	−20.25***	−0.037	−4.99***	−0.125	−11.31***
ΔTang	0.120	14.27***	0.184	14.02***	0.098	5.99***
ΔDebt_TS	0.000	1.53	0.000	1.12	0.000	2.18**
ΔNdebt_TS	−0.047	−3.68***	0.009	0.54	−0.136	−8.18***
INVPRO	0.000	0.18	−0.002	−2.16**	−0.001	−0.80
CR	0.000	0.41	0.001	1.01	0.002	2.05**
MARKET	−0.004	−5.48***	−0.007	−5.27***	0.001	0.68
TAX	0.017	3.25***	0.026	2.95***	0.001	0.09

(continued on next page)

TABLE 8 (continued)

	InfoQuality = Earnings Precision		*InfoQuality = Accruals Quality*		*InfoQuality = Analyst Consensus*	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
DEV	0.002	1.04	0.007	1.94*	−0.006	−0.99
INST_OWN	−0.014	−5.47***	−0.018	−4.46***	−0.007	−1.58
FAM_OWN	−0.003	−1.05	−0.004	−0.95	−0.004	−0.75
STATE_OWN	0.002	0.54	−0.007	−1.14	0.020	2.81***
Year Dummies	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Adj. R^2 (percent)	8.14		4.98		9.31	
No. of Firm-Years	92,583		66,449		40,345	

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed), respectively.
The table reports the results when the institutional variable is measured by the country-level bankruptcy resolutions costs, *BANKRUPT*. Panel A reports the results for the levels regression:

$$BLEV_t = \alpha_0 + \alpha_1 InfoQuality_{t-1} + InfoQuality_{t-1} * BANKRUPT + \gamma BANKRUPT + \psi Firm\ and\ Country\ Controls + Fixed\ Effects + \varepsilon_t.$$

Panel B reports results for the above regression, but with a change specification, for all three proxies of information quality. The country and firm controls are the same set of controls as in Table 5.
Detailed definitions of the variables are provided in Table 1.

quality and capital structure outside the U.S. More important, because capital structure depends on the institutional, legal, and financial environment in a specific country, it is important to understand whether information quality plays the role of substitute or complement in countries with stronger institutions compared to countries with weaker institutions. We extend the literature by investigating whether the relation between the quality of a firm's accounting information and its capital structure varies systematically with differences in the characteristics of the institutional environment in which it operates.

We expect that higher information quality mitigates information asymmetry between the firm and outside investors. Consequently, firms that provide high-quality information use more equity as opposed to debt when they seek external financing, which results in lower financial leverage in their capital structure. Additionally, we expect differences in the characteristics of the institutional environment in which a firm operates to systematically affect the relation between information quality and financial leverage, although we do not make predictions on the direction of these effects.

We employ three measures of information quality (earnings precision, accruals quality, and analyst consensus) to triangulate our inferences on the effect of information quality on capital structure decisions. We use data from 24 countries over the period 1996 to 2011 to test our predictions. Our empirical findings consistently show that firms that exhibit higher information quality have lower financial leverage in their capital structures. This result implies that higher information quality reduces information asymmetry between the firm and outside investors, leading to greater use of equity financing than debt financing in the firm's capital structure decision. In addition, we find that the impact of information quality on capital structure is more pronounced when country-level investor protection is weaker and when the economy is more market oriented. The cross-country results suggest that information quality is more important in shaping a firm's capital structure decision when investor demand for information is greater. Our study adds to the debate about whether firm-level information quality is a complement to or a substitute for country-level institutions in shaping a firm's capital structure decision.

The composition of a country's institutional infrastructure is not just limited to investor protection and financial orientation. A potential avenue for future research is to examine the interplay between firm-level information quality and variation in other institutional factors, such as tax regimes, disclosure regulation and enforcement, investor attention, and media penetration. Future studies can compare settings in which specific aspects of the institutional environment are likely to be more important in shaping the information quality-capital structure relation. In addition, there are different channels through which information quality affects a firm's capital structure decisions or cost of raising debt versus equity capital, such as liquidity risk and estimation risk. Variation in the effects of different aspects of the institutional environment on different channels connecting information quality to capital structure offers another opportunity for future research.

TABLE 9

Sensitivity Tests

Panel A: Removing U.S. and Japanese Firms from the Sample

	Full Sample		Investor Protection (*INVPRO*)		Capital Market Size (*MARKET*)	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Analyst Consensus	−0.072	−9.91***	−0.057	−7.33***	−0.071	−3.51***
*Analyst Consensus * INST*			0.053	7.30***	−0.026	−2.08**
INST			−0.038	−17.68***	−0.031	−10.71***
Controls	Yes		Yes		Yes	
Adj. R^2 (percent)	25.60		25.91		25.97	
No. of Firm-Years	21,358		21,358		21,358	

Panel B: Using Market Leverage (*MLEV*) to Measure Leverage

	Full Sample		Investor Protection (*INVPRO*)		Capital Market Size (*MARKET*)	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Analyst Consensus	−0.088	−14.79***	−0.090	−15.19***	−0.083	−13.81***
*Analyst Consensus * INST*			0.023	4.28***	−0.020	−1.66*
INST			−0.013	−7.50***	−0.022	−8.65***
Controls	Yes		Yes		Yes	
Adj. R^2 (percent)	35.11		35.15		34.33	
No. of Firm-Years	40,802		40,802		40,802	

Panel C: Using Long-Term Book Leverage (*BLLEV*) to Measure Leverage

	Full Sample		Investor Protection (*INVPRO*)		Capital Market Size (*MARKET*)	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Analyst Consensus	−0.028	−5.30***	−0.030	−5.76***	−0.031	−5.57***
*Analyst Consensus * INST*			0.013	2.78***	−0.022	−2.30**
INST			−0.018	−11.81***	−0.010	−4.88***
Controls	Yes		Yes		Yes	
Adj. R^2 (percent)	27.15		27.16		27.16	
No. of Firm-Years	42,387		42,387		42,387	

Panel D: Using Net Book Assets (*NBALEV*) to Measure Leverage

	Full Sample		Investor Protection (*INVPRO*)		Capital Market Size (*MARKET*)	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Analyst Consensus	−0.079	−8.25***	−0.060	−5.74***	−0.084	−8.33***
*Analyst Consensus * INST*			0.056	5.45***	−0.033	−1.91*
INST			−0.050	−17.22***	−0.035	−8.28***
Controls	Yes		Yes		Yes	
Adj. R^2 (percent)	26.67		26.80		26.68	
No. of Firm-Years	40,978		40,978		40,978	

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TABLE 9 (continued)

Panel E: Controlling for Liquidity

	Full Sample		Investor Protection (*INVPRO*)		Capital Market Size (*MARKET*)	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Analyst Consensus	−0.099	−9.34***	−0.055	−4.06***	−0.136	−6.69***
Analyst Consensus ∗ INST			0.070	5.13***	−0.028	−2.22**
INST			−0.014	−2.62***	−0.005	−0.95
ZERORET	0.120	5.61***	0.122	5.72***	0.121	5.62***
Controls	Yes		Yes		Yes	
Adj. R^2 (percent)	31.97		32.19		32.01	
No. of Firm-Years	8,879		8,879		8,879	

Panel F: Controlling for Time Trend

	Full Sample		Investor Protection (*INVPRO*)		Capital Market Size (*MARKET*)	
	Coeff.	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Analyst Consensus	−0.061	−9.54***	−0.065	−10.27***	−0.059	−9.07***
Analyst Consensus ∗ INST			0.039	6.79***	−0.018	−1.68*
INST			−0.025	−13.29***	−0.017	−7.27***
TREND	0.021	5.21***	0.021	5.20***	0.018	4.44***
Controls	Yes		Yes		Yes	
Adj. R^2 (percent)	25.86		25.96		25.86	
No. of Firm-Years	42,387		42,387		42,387	

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed), respectively.
This table reports the results of sensitivity tests. In Panel A, we report results after removing U.S. and Japanese firms from the sample. Panel B reports the results when the dependent variable is the market value of leverage, defined as the total debt to market value of the assets ratio. Panel C reports the regression results when the dependent variable is the long-term book value of leverage, defined as the long-term debt to total assets ratio. Panel D reports the regression results when the dependent variable is total debt divided by net book value of assets. Panel E reports results with additional control for liquidity. *ZERORET* is the number of zero-return trading days over the firm's fiscal year divided by the total trading days of the year, with higher values corresponding to greater illiquidity. Panel F reports results after controlling for the time trend effect, *TREND* captures the trend of financial leverage overtime.
Detailed definitions of the variables are shown in Table 1.

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