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Earnings management, capital structure, and the role of institutional environments ☆

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ABSTRACT

This paper examines the effect of earnings management on financial leverage and how this relation is influenced by institutional environments by employing a large panel of 25,777 firms across 37 countries spanning the years 1989–2009. We find that firms with high earnings management activities are associated with high financial leverage. More importantly, this positive relation is attenuated by strong institutional environments. Our results lend strong support to the notions that (1) both corporate debt and institutional environments can be served as external control mechanisms to alleviate the agency cost of free cash flow; and (2) it is less costly to rely on institutional environments than debt. After meticulously addressing the possible endogeneity issues and conducting various robustness tests, our main conclusions remain confirmed.

1. Introduction

One primary question in corporate finance is how firms make their capital-structure decisions. The trade-off theory predicts that the optimal financial leverage should be chosen based on a trade-off between the benefits and costs of debt.[1] The former includes, for example, tax savings, reduced agency cost between manager and shareholder. The latter includes, for example, bankruptcy costs/financial distress costs, agency conflicts between shareholder and debtholder (Graham and Leary, 2011). The pecking order theory by Myers and Majluf (1984) suggests that "…firms follow a financing hierarchy designed to minimize adverse selection costs of security issuance" (Graham and Leary, 2011, p.310). The existing empirical capital-structure studies have endeavored to use firm and industry characteristics to explain the variation of financial leverage.[2] Earnings management, as an important proxy for information quality presented by insiders to outsiders (Ng, 2011), is surprisingly ignored from the existing literature.

Understanding the role of earnings management in determining leverage is important, because, as Leuz et al. (2003) mention, "…insiders, in an attempt to protect their private control benefits, use earnings management to conceal firm performance from outsiders" (p.505). Debtors, like banks, rely on earnings quality to issue bank loans and charge the corresponding loan prices (Bharath, Sunder and Sunder, 2008). Shareholders' wealth are influenced by the linkage not only between earnings and stock returns,[3] but also between earnings management and firm values (higher liquidity or lower cost of equity capital).[4] This paper tries to fill this gap by investigating the impact of earnings management on leverage at firm level across the world.

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[1] Kraus and Litzenberger (1973), Leland (1994) and Fischer et al. (1989).

[2] For example, Titman and Wessels (1988), Lemmon et al. (2008) and Frank and Goyal (2009) study how United States (U.S.) firms' leverage variations are explained by firm and industry characteristics, including, for example, firm size, market-to-book ratio, profitability, tangibility, and industry-median leverage.

[3] Sloan (1996), Ball et al. (2003), Kothari et al. (2006) and He and Hu (forthcoming).

[4] Ng (2011) and Lang et al. (2012).

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There is growing research that highlights the important role of institutional environments in determining capital-structure decisions. As Rajan and Zingales (1995) point out, "...the view of institutions is important because they may affect the within-country cross-sectional correlation between leverage and factors..." (p.1422). These studies find that firms operating in stronger institutional environments tend to use lower financial leverage.[5] One possible explanation for this finding is that strong investor protection and legal enforcement mitigate agency conflicts (La Porta et al., 1998, 2002). Furthermore, relying on institutional environments in mitigating agency conflicts does not carry incremental costs for individual firms because institutional environments are broadly thought to be set beyond firms' control. Instead, using financial leverage may result in bankruptcy costs and agency cost of debt (i.e., debt overhang and asset substitution problems),[6] though financial leverage may serve as an external control mechanism in reducing the agency conflicts arisen from the separation of ownership and control in associating with earnings management.[7]

In sum, if investor protection is a costless substitute for financial leverage in terms of their roles in reducing the agency conflicts between managers and shareholders, then one should hypothesize that financial leverage is higher among firms with more severe agency conflicts and this relation should become less pronounced in countries with stronger investor protection. On the contrary, if investor protection and financial leverage are complements, then one should expect the relation between leverage and the severity of agency problem to be more pronounced in countries with stronger investor protection.

We use earnings management as a proxy for agency conflicts between inside managers and outside investors. Earnings management is frequently used as a measure for information quality in the literature. For instance, Leuz et al. (2003) argue that reported accounting earnings are managed to disguise insider private control benefits, so that external monitoring and reputation loss can be avoided. In addition, Giannetti and Jayaraman (2012) argue that the opaque firm disclosure policy can help retain insider private control and extract benefits independent on firm performance, and they employ earnings management as a measure of informativeness of financial statements. Bhattacharya et al. (2003) and Lang et al. (2012) employ this proxy to measure information asymmetry faced by the outside investors, compared to insiders. Francis et al. (2005) and Ng (2011) also employ earnings management to proxy for information quality in their studies. Managerial discretion/judgment in reported earnings may make firms' true underlying economic performance (i.e., operating cash flow) available only to insiders. Therefore, earnings management allows managers to finance *sub-optimal investments* that maximize their own utilities at the expense of some informationally disadvantaged stakeholders. Similarly, earnings management may facilitate insiders' *tunneling* activities.

Based on the agency cost of free cash flow theory, we study whether financial leverage is higher for firms with more earnings management, which exacerbates the information asymmetry of free cash flow.[8] Next, we examine how institutional environments influence the impact of earnings management on financial leverage. Leuz et al. (2003) suggest that strong institutional environments can attenuate the agency conflicts by reducing managers' earnings management activities. They argue that strong institutional settings, in particular, strong investor protection and legal enforcement, limit the managers' ability to acquire private control benefits, thus, reducing the likelihood of earnings management activities. We argue that strong institutional environments mitigate agency conflicts by granting investors rights in preventing managers from expropriating their investments and ensuring investors' rights can be implemented in the time of need. Thus, to reduce the costs of debt financing, investors of firms operating in countries with stronger institutional environments become more reliant on "free" macro-level investor protection than using debt as a control mechanism. Therefore, we expect the earnings management – capital structure relation to be less pronounced in countries with strong institutional settings.

To address these questions empirically, we employ a sample of 37 countries spanning the years 1989–2009 to investigate how financial-leverage decisions are determined by the level of earnings management across countries. The multi-country sample also allows us to test how country-level characteristics can affect the relation between earnings management and capital-structure decisions.

Consistent with our hypotheses, we have two novel empirical findings. First, we show that earnings management is significantly and positively correlated with firms' leverage. Combined with the notion that a firm's earnings management reflects the agency conflicts of information asymmetry between managers and investors, this finding is consistent with the disciplining function of debt to reduce the agency cost of free cash flow.

Second, we examine the role of institutional environments in reshaping the relation between earnings management and capital-structure decisions. We study this effect by adding an interaction of earnings management and institutional environments to our model. We document that strong institutional environments tend to attenuate the positive relation between earnings management and financial leverage. This evidence indicates that strong institutional environments grant and enforce investor rights in mitigating the impact of earnings management on corporate decisions, which make earnings management less sensitive to capital-structure decisions.

We find the above results are robust to three earnings management measures based on the magnitude of accruals or earnings smoothing (Leuz et al., 2003) and to two measures of leverage ratio. We also perform other robustness checks. We estimate our results by employing three different estimation methods. We use (1) an instrumental-variable approach, where our regression coefficient estimators are based on either two-stage least squares (2SLS) or generalized method of moments (GMM), to address endogeneity, (2) a dynamic model of capital structure to account for the partial adjustment behavior (Flannery and Rangan, 2006), and (3) a doubly-censored Tobit model as leverage ratios are bounded between zero and one (Elsas and Florysiak, forthcoming). In addition, we document that our results hold for different subsamples where we (1) remove firms from the U.S., the U.K., and Japan, (2) include firms from developed countries only, and (3) include firms from developing countries only. Finally, the results prevail not only for our primary institutional-environment variables – legal origin and the first principle component of five legal enforcement proxies – but also for alternative macro-level institutional-environment variables, including shareholder rights, accounting information quality, governance indicators, and governance index based on corporate ethics.

One challenge for this paper is the endogeneity and reverse causality issues. The former arises when both leverage and earnings management may be influenced by unobservable omitted variable(s). The latter happens when leverage appears to be a determinant of earnings manipulations in the literature. The

[5] For example, Demirguc-Kunt and Maksimovic (1998, 1999), Booth et al. (2001), Giannetti (2003), Antoniou et al. (2008) and Fan et al. (2012) examine the associations between institutional environments and capital structure by employing multi-country data.

[6] See Burkart et al. (2003) for a similar argument based on the comparison between costly monitoring and costless country-wide legal protection.

[7] See Jensen and Meckling (1976) and Jensen (1986) for theoretical justification and Harvey et al. (2004) for empirical evidence on emerging market firms.

[8] In addition, the above prediction is also consistent with pecking order theory (Myers, 1984 and Myers and Majluf, 1984). That is, earnings management increases firms' external financing costs; external equity financing becomes disproportionally less desirable than debt when external funding is needed for investment.

empirical results from this paper do not try to establish a strong causality relationship from earnings management to leverage, rather they are suggestive of an interesting association between them. Nevertheless, we address these endogeneity concerns in the paper as follows, assuring that endogeneity and reverse causality are not a major problem of our main conclusions.

First, due to the inclusion of firm-fixed effect, it is unlikely that our results are merely reflective of the unmodeled differences across firms. More specifically, a within-firm variation explains the positive impact of earnings management on leverage even controlling for the differences across firms. This demonstrates that the possible association of high leverage and high earnings management in some firms do not likely drive the results, because the evidence still exists in a within-firm test.[9] Second, we employ extensive control variables in our analysis by following the existing literature to take into account the endogeneity issues for earnings management. For example, we control for market-to-book ratio as it, as a proxy for growth opportunity, may affect both leverage and earnings management. In addition, we use year-fixed effects to control for other unobservable time-varying factors. Third, we use the past five years' accounting data to construct our earnings-management variables and lag them by one year in our leverage regressions. For example, to analyze the effect of earnings management on leverage in year 2010, we use balance sheet items from years 2005–2009 to construct our earnings-management measures. Employing lagged earnings management suggests that our testing results do not suffer from the influences of an unobservable variable driving both leverage and earnings management. Fourth, we employ an instrumental-variable approach by employing two-stage least squares (2SLS) and generalized method of moments (GMM) estimators. We choose the instrument variables that are highly correlated with earnings-management variables but are not correlated with the residuals. The results demonstrate that the main conclusions remain valid. Even with all the above efforts, we acknowledge endogeneity is a difficult issue in this kind of study. Nevertheless, the overall evidence from the above analysis shows that endogeneity is not a problem serious enough to deny our main conclusions.

This paper contributes to the current literature from the following aspects. First, earnings management is explicitly used to proxy for information asymmetry of free cash flow in a large international sample, confirming its suitability as documented by Leuz et al. (2003). We provide novel evidence on the firm-level heterogeneity in financial leverage that complements the extant capital-structure literature.[10] Specifically, we document the positive relation between earnings management and financial leverage, which is consistent with the prediction that debt is able to reduce the agency cost of free cash flow. In particular, this paper is consistent with Harvey et al. (2004), who document that debt can bring benefits to firms with high expected agency cost and overinvestment problems.

Second, we shed new light on the effect of institutional environments on financial leverage. There is a rich set of papers examining how capital-structure decisions are influenced by country-level institutional settings.[11] Moreover, institutional environments may affect the speed of leverage adjustment to target. Oztekin and Flannery (2012) find that transaction costs of external financing are lower and the speed of leverage adjustment is higher in countries with better institutional environments. In addition to the extant evidence, we show that the leverage sensitivity to earnings management is significantly attenuated in countries with strong institutional environments. To the best of our knowledge, we are the first to highlight the role of institutional environments in effectively reducing the impact of agency conflicts on capital-structure decisions.

Third, our multi-country analysis allows us to identify how institutional environments affect the sensitivity of capital structure to earnings management, thus contributing to the extant literature on the impact of macro-level institutional environments on financial markets. For instance, Shleifer and Wolfenzon (2002), La Porta et al. (2002, 2006), among many others, establish the links between institutional environments and financial markets, such as the benefit of financial market developments brought by strict legal disclosure requirement and liability enforcement. In addition, Gelos and Wei (2005), Li et al. (2006) and Leuz et al. (2009) demonstrate the significant role of macro information environments in reshaping the investment decisions of various investors.

The remainder of this paper is organized as follows: we discuss the theoretical motivation and empirical hypotheses in Section 2 and empirical design in Section 3; our data and sample are reported in Section 4; Section 5 presents the empirical results; Section 6 reports the robustness tests; and Section 7 provides the conclusion.

2. Theoretical motivation and empirical hypotheses

This section provides a summary of predictions on how earnings management affects financial leverage, followed by a discussion on what the role of institutional environments is in reshaping the financial leverage sensitivity to earnings management.

2.1. Earnings management in determining capital structure

Shareholders of the firms run by professional managers may suffer loss due to the conflict of interests between shareholders and managers. Relatedly, these firms tend to be associated with more severe earnings manipulation because opaque firm disclosure policy can help managers retain private control and extract benefits (Giannetti and Jayaraman, 2012). Therefore, earnings management may facilitate corporate managers to engage in *sub-optimal investment* and/or *tunneling* activities because it makes information about cash flow private to corporate insiders.

Anticipating that, it is in the best interest of shareholders to use institutional-environment mechanisms to alleviate the agency conflicts. One institutional-environment mechanism is to use financial leverage to reduce the amount of free cash flows available to corporate managers. This mechanism seems to be particularly effective in situations where managers deliberately create opaque accounting reports to mislead shareholders about the firms' free cash flows because managers have to make obliged interest payments rather than discretionary dividends (Jensen and Meckling, 1976 and Jensen, 1986). Harvey et al. (2004) examine the effect of financial leverage on reducing agency costs by focusing on firms with extreme agency costs (i.e., firms operating in emerging markets with pyramidal structures). They document that financial leverage increases firm value, measured by Tobin's Q.

Along a similar dimension, we expect financial leverage to reduce agency costs, particularly, for firms with severe earnings manipulations. Nevertheless, our paper has two distinct features from Harvey et al. (2004). First, our focus is capital-structure policy rather than the effect of capital structure on valuation. Second, we further test for the role of institutional environments (more on this below). In sum, we hypothesize that higher earnings management activities increase the demand for debt as an external control mechanism, controlling for the costs of financial leverage, such as bankruptcy cost and agency cost of debt.[12]

[9] See a similar argument by Lang et al. (2012).

[10] For instance, Titman and Wessels (1988), Lemmon et al. (2008) and Frank and Goyal (2009), among others.

[11] For instance, Rajan and Zingales (1995), Demirguc-Kunt and Maksimovic (1998, 1999), Booth et al. (2001), Giannetti (2003), Antoniou et al. (2008) and Fan et al. (2012), among others.

[12] See Frank and Goyal (2009) for a survey of important leverage determinants.

H1. *Firms with a higher level of earnings management are expected to have higher financial leverage, ceteris paribus.*

Although there is no study on the impact of earnings management on leverage, there are some studies directly or indirectly linking these two variables. For instance, Haw et al. (2004) find that firms with high financial leverage have more income managements, in order to alleviate accounting constraints in debt contracts and facilitate debt renegotiations during financial distress. Leuz et al. (2003) document a negative relation between earnings management and institutional environments, and Fan et al. (2012) document a negative relation between leverage and institutional environments. Given both earnings management and leverage exhibit a negative relation with institutional environments, this paper tries to establish this link explicitly, thus contributing to the understanding of the link between earnings management and leverage.

2.2. The role of institutional environments

Like financial leverage, institutional environments are broadly thought as external control mechanisms to avert agency conflicts. For example, La Porta et al. (1998) document that capital markets are more developed in countries with more sophisticated legal systems. Capital markets competition, such as hostile takeover, is another external control mechanism that alleviates agency problems. For instance, Shleifer and Wolfenzon (2002) summarize that "...better legal protection of outside shareholders is associated with: (1) more valuable stock markets (La Porta et al., 1997); (2) a higher number of listed firms (La Porta et al., 1997); (3) larger listed firms in terms of their sales or assets (Kumar et al., 2001); (4) higher valuation of listed firms relative to their assets (Claessens et al., 2002; La Porta et al., 2002); (5) greater dividend payouts (La Porta et al., 2000); (6) lower concentration of ownership and control (ECGN, 1997; La Porta et al., 1999; and Claessens et al., 2000); (7) lower private benefits of control (Zingales, 1994 and Nenova, 2003); and (8) higher correlation between investment opportunities and actual investments (Wurgler, 2000)" (p.3–4). More recently, La Porta et al. (2006) document that laws of mandating information disclosure can benefit stock markets. Ng (2011) documents that higher earnings information quality can reduce liquidity risk and thus the cost of equity capital. Lang et al. (2012), in an international setting, document that lower earnings management is associated with greater liquidity, lower transaction costs, and lower cost of equity capital.

However, institutional environments are generally set beyond firms' control and are less costly, if any, external control mechanisms than financial leverage. That is, it seems that there are almost no incremental costs for individual firms to mitigate agency conflicts by relying on institutional environments. In contrast, although financial leverage can reduce agency conflicts as institutional environments, using financial leverage is usually associated with bankruptcy costs and agency cost of debt.

To see this, consider a situation where firms have already chosen their optimal capital structure in the *absence* of manager-shareholder conflicts. Next, firms realize that there exist such conflicts. To reduce agency conflicts, firms may have to increase their leverage ratios, leading to an increase in borrowing costs. Last, if firms are operating in an environment with weak investor protection, then increasing leverage may be worthwhile as the benefits of leverage increase may exceed the additional borrowing costs. Otherwise, firms are protected by strong institutional environments. In this latter case, increasing financial leverage may have much less incremental effect on reducing agency conflicts but firms still have to bear additional borrowing costs.

Taken together, shareholders in countries with stronger (weaker) institutional environments become more (less) reliant on "cheaper" macro-level investor protection than using debt as a control mechanism to save on borrowing costs. Consistent with this view, Fan et al. (2012) confirm that the increase in debt is associated with weak institutional environments. Different from their study, our hypothesis attempts to further pin down through which channel firms want to borrow more and what the role of institutional environments is in altering firms' propensity to borrow. That is, weak institutional environments worsen the agency problem between shareholders and managers, thus strengthening the positive link between leverage and earnings management.

Put differently, strong investor protection grants shareholders rights in preventing managers from expropriating their investments, and strong legal enforcement ensures shareholders' rights can be implemented in time of need. Consequently, shareholders' demand for debt in mitigating the agency problem is attenuated by strong institutional environments.

In this paper, we employ a legal origin dummy (*LegCom*) and enforcement index (*P_Enfor*) as macro-level institutional-environment variables. We expect that the impact of earnings management on financial leverage is lower in the countries with a common law legal system and stronger legal enforcement. Haw et al. (2004) and Giannetti and Jayaraman (2012) find that the positive impact of ownership concentration and insider control, respectively, on earnings management is attenuated in countries with strong investor protection. Giannetti and Jayaraman (2012) argue that strong investor protection countries can provide higher benefits from reducing information asymmetry in complex ownership structures. Our hypothesis supports their arguments in the same spirit in that strong institutional environments attenuate the functioning of earnings management.

H2a. *The positive association between earnings management and leverage ratio is attenuated in countries with strong institutional environments (IE), ceteris paribus.*

As an alternative argument, strong institutional environments and debt, can complement each other in disciplining the firms in reducing agency problems. More specifically, the effectiveness of the corporate control mechanism for debt can be enhanced for firms in strong institutional environments, because the latter can provide a better enforcement mechanism, information environments, and investor and debtor protection. Doidge et al. (2007) document that country characteristics are much more explanatory in explaining firm level governance and transparency, compared to firm level characteristics. Li et al. (2011) document that the stabilizing role of foreign institutional owners to reduce firm level volatility is more pronounced in those emerging countries with better institutional environments.

H2b. *The positive association between earnings management and leverage ratio is strengthened in countries with strong institutional environments (IE), ceteris paribus.*

3. Empirical design

3.1. Empirical model

Empirical capital-structure research shows that leverage ratio is a function of various firm, industry, and country characteristics. In this paper, we focus on the effect of earnings management on firms' capital-structure decisions. In addition, we examine whether this relation is influenced by macro-level institutional environments.

Specifically, we regress leverage ratio on earnings-management measure and on its interaction with macro-level institutional-environment variables. Our empirical model is given as follows,

$$ML_{j,i,t} = \alpha + \beta_{11} EM_{j,i,t-1} + \beta_{21} EM_{j,i,t-1} \times IE_j + \boldsymbol{\beta}_{12} \mathbf{X}_{j,i,t-1} + \boldsymbol{\beta}_{22} \mathbf{X}_{j,i,t-1} \times IE_j + \boldsymbol{\beta}_{13} \mathbf{Y}_{j,t-1} + \boldsymbol{\beta}_{23} \mathbf{Y}_{j,t-1} \times IE_j + f_i + y_t + e_{j,i,t}, \quad (1)$$

where country is indexed by j, firm by i, and time by t. We use market leverage ratio (ML) as the dependent variable. EM is our earnings-management variable (i.e. $EM \in \{Accr, Smth, Corr, P\_EM\}$). Macro-level institutional-environment variable is denoted by IE. $\mathbf{X}_{j,i,t}$ is a vector of firm- and industry-level control variables, including Tangibility (*Tang*), Firm Size (*Size*), Profitability (*Prof*), Market-to-Book ratio (*MTB*) and Industry-Median Leverage (*IndMed*). $\mathbf{Y}_{j,t}$ is a vector of country control variables, including GDP per capita (*GDPC*), Stock Market Capitalization to GDP (*MCAP*) and GDP Growth (*GGDP*). In order to capture the unobserved heterogeneity across firm and time, we control for firm-fixed effect f_i and year-fixed effect y_t in Eq. (1).[13] The firm-fixed effect can better control for time-invariant factors that influence earnings management and leverage simultaneously. Standard errors are robust to clustering within each country.

3.2. Earnings-management measures

Healy and Wahlen (1999) define earnings management as follows:

> *"Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers" (p.6).*

Conflict of interest exists between inside managers and outside investors in a corporate context. Managers have incentives to use their control to extract private benefits at the expense of other stakeholders. Outsiders monitor managers' behavior and take disciplinary actions if such extractions are detected. Thus, managers disguise private control benefits by reducing the variability of reported earnings. For example, in years of good performance, managers use financial reporting accruals to understate earnings which create reserves for the years of bad performance. Such activities smooth financial earnings, lead to information asymmetry about free cash flow between insiders and outsiders, and help managers extract private control benefits.

In this paper, we use earnings management as a proxy for agency cost of free cash flow. Our earnings-management measures are based on Leuz et al. (2003) that develop several variables to measure insiders' discretion in reporting earnings and reduce earnings volatility via accruals.

Our first earnings-management variable is earnings discretion (*Accr*). It captures the extent that insiders can exercise discretion in reporting earnings. Leuz et al. (2003) define the magnitude of accruals as the absolute value of firms' accruals scaled by the absolute value of firms' cash flow from operations (p.510). Dechow et al. (1996) argue that accruals can increase due to managerial manipulation and then are reversed later. In addition, they also suggest that a few years are needed to detect managerial manipulation. Thus, our *Accr* is computed as the five year moving average of the magnitude of accruals.[14]

Our second (*Smth*) and third (*Corr*) earnings-management variables capture earnings smoothing. In particular, *Smth* measures the reduction in variance of earnings due to accrual alteration. It is computed as the standard deviation of firms' operating income scaled by the standard deviation of operation cash flow.[15] *Corr* captures the extent that insiders disguise any surprises in cash flows by using their accounting discretion. It is the correlation of two changes (accruals and cash flows), computed as the correlation between changes in accruals and changes in cash flow from operations.[16,17] We multiply *Smth* and *Corr* by −1. In such a way, higher values of *Accr*, *Smth* and *Corr* imply higher levels of earnings management. Finally, the first principal component of *Accr*, *Smth*, and *Corr* (*P_EM*) is used as an overall measure.

3.3. Institutional-environment variables

In order to study how institutional environments affect the impact of earnings management on firms' capital-structure decisions, we firstly draw several macro-level variables from La Porta et al. (1998). Particularly, they suggest that common law countries are associated with better investor protection than civil law countries. We use the common law dummy (*LegCom*) as a measure of investor protection. It equals to one for common law countries, and zero otherwise. In addition, strong legal enforcement ensures investors' rights can be implemented at the time of need and protects their investments from managers' expropriation. Consequently, we also examine an enforcement variable (*P_Enfor*), which is the first principal of the following five legal enforcement proxies: efficiency of judicial system (*EffJud*), rule of law (*RulLaw*), level of corruption (*Corruption*), risk of expropriation (*RisExp*), and repudiation of contracts by government (*Repudiation*).

3.4. Control variables

In the case of bankruptcy, tangible assets, such as property, plant, and equipment are less likely to lose their market value. Thus, tangible assets have lower expected distress cost. Hence, lower risk premium is demanded by the lender. This suggests a positive relation between firms' leverage and tangibility. According to pecking order theory, firms rely on retained earnings to finance a new project. Debt is issued when internal finance is depleted, and equity is the least preferred financing channel. Thus, we expect an inverse relation between firms' leverage and profitability. Firms with high expected growth opportunity face high financial distress cost. Thus, less debt is used by managers. We use market-to-book ratio as a proxy for firms' growth opportunity, and expect a negative relation between firms' leverage and market-to-book ratio. Industry-median leverage ratio is usually used as a proxy for target capital structure which provides firms a benchmark to build their own capital structures. We control for industry-median leverage ratio in the models and expect that it positively affects firms' leverage. In addition, in order to capture the

[13] We do not include *IE* variable itself in a firm-fixed model, because there are little variations in this variable and thus it does not have explanatory power (Mclean et al., 2012, p.317).

[14] $Accr_{j,i,t} = 1/5 \sum_{t-4}^{t} |Accruals_{j,i,t}/CF_{j,i,t}|$, $Accruals = (\Delta Assets - \Delta Cash\ and\ equivalent) - (\Delta Current\ liability - \Delta Short\ term\ debt - \Delta Income\ taxes\ payable) - Depreciation\ and\ amortization\ expense$, Cash flow from operations (*CF*) =*Operating income* − *Accruals*. For a firm, if the changes of short-term debt and taxes payable are not available, these variables are set as zero. All accounting variables are scaled by one year lag of total assets. A minimum of three years is required.

[15] $Smth = -\sigma(Operating\ income) / \sigma(CF)$ over the last five years. A minimum of three years is required.

[16] $Corr = -\rho(\Delta Accr, \Delta CF)$ over the last five years. A minimum of three years is required.

[17] In the robustness tests, we recalculate *Accr*, *Smth*, and *Corr* by restricting the data, so that data has to be available at least three out of the last four or six years. The results are qualitatively consistent.

heterogeneity across countries, we also control for GDP per capita, stock market capitalization to GDP, and GDP growth in the models.[18]

4. Data and sample

We collect firm-level accounting data from Worldscope that contains annual financial data of publicly traded firms around the world. Country-level control variables (*GDPC, MCAP*, and *GGDP*) are obtained from World Development Indicators (WDI).[19] Macro-level institutional-environment variables are extracted from La Porta et al. (1998), Djankov et al. (2008), Bushman et al. (2004), Kaufmann et al. (2009) and Kaufmann (2004).

We apply several filters to remove potential data errors and outliers. Observations with leverage ratio beyond the unit interval are removed. All firm-level variables are winsorized at the top and bottom one percent levels. Following Leuz et al. (2003), we remove the countries with less than 300 firm-year observations. Further, observations of Argentina, Brazil and Mexico are excluded from our sample since these countries experienced hyperinflation over the sample period. Moreover, we remove financial or utility firms from the sample since the financial leverage of these firms are presumably regulated and hence different from firms in other industries. Finally, there are 166,163 firm-year observations left in the sample which contains 25,777 firms across 37 countries spanning from 1989 to 2009.[20]

Table 1 provides a sample description that reports number of years, number of firms, and number of firm-year observations of each country. As shown in Column 1, there are 24 out of 37 countries that cover the full sample period (i.e., 21 years). Columns 2 and 3 show that the sample coverage is fairly different across countries in terms of number of firms and number of firm-year observations, respectively. In our sample, developed countries tend to have larger coverage than developing countries.[21]

Table 2 reports the summary statistics of firm-, industry- (Panel A), and country-level (Panel B) variables of interest. In general, our key dependent variables and explanatory variables resemble those used in the literature. In particular, the mean and standard deviations of market leverage are 0.27 and 0.25, respectively. For earnings-management variables, the sample means (standard deviations) of *Accr*, *Smth*, *Corr*, and *P_EM* are 1.20 (1.84), −0.66 (0.42), 0.77 (0.34), and 0.03 (1.22), respectively. Panel C of Table 2 describes the statistics of macro-level institutional-environment variables. Our institutional-environment variables are available in most of the sample countries.

Table 3 summarizes the country medians for each earnings-management measures. These moments are consistent with Leuz et al. (2003), though they focus on a sample of 31 countries.

Table 4 presents the correlation matrix between financial leverage and firm- (and industry-) level control variables. This table shows how financial leverage is correlated with firm and industry characteristics. In particular, Table 4 exhibits that financial leverage (i.e., *ML* and *BL*) are positively associated with earnings-management variables, *Tang*, *Size*, and *IndMed*, but negatively related to *Prof* and *MTB*. In addition, there is no evidence that the independent variables are highly correlated.

Table 1
The sample: This table provides a description of the sample. Number of years, number of firms, and number of firm-year observations of each country are reported in Columns 1–3, respectively.

Market	No. of years [1]	No. of firms [2]	No. of firms firm-year observations [3]
Australia	21	1021	4340
Austria	21	89	635
Belgium	21	123	976
Canada	21	1106	5513
China	16	1320	5605
Chile	19	106	746
Denmark	21	151	1387
Ireland	14	64	462
Finland	21	141	1306
France	21	862	6177
Germany	21	806	5800
Greece	21	264	1644
Hong Kong	21	780	3862
Indonesia	16	228	1447
India	13	332	1240
Israel	13	88	407
Italy	21	268	1869
Japan	21	3655	31,145
South Korea	20	943	4831
Malaysia	21	726	3935
Netherlands	21	181	1735
Norway	21	199	1296
New Zealand	21	91	522
Pakistan	15	71	483
Poland	13	178	589
Portugal	21	74	548
Philippines	17	109	676
South Africa	21	298	1897
Singapore	21	557	2760
Spain	21	140	1117
Sweden	21	322	2078
Switzerland	21	202	1905
Thailand	18	399	2465
Turkey	17	172	996
Taiwan	17	1190	5145
United Kingdom	21	1976	13,792
United States	21	6545	44,832
Total		25,777	166,163

5. Empirical results

This section presents regressions that estimate the impact of earnings management on capital-structure decisions (**H1**) and how this relation is affected by institutional environments (**H2a** and **H2b**).

Firstly, we regress market leverage on earnings-management measures (*Accr, Smth, Corr*, and *P_EM*) to examine how firms' earnings management activities affect their capital-structure decisions. Table 5 shows that the coefficient estimates of our earnings-management variables are all positively and significantly related to market leverage. Specifically, the coefficient estimates (t-statistics) of *Accr*, *Smth*, *Corr*, and *P_EM* are 0.2522 (5.7574), 0.6867 (4.0992), 0.6105 (3.1691), and 0.2494 (4.0229), respectively. These results are not only statistically but also economically significant. For example, we know from Table 2 that the standard deviation of *P_EM* is 1.22. Multiplying it by the coefficient estimate of *P_EM* in Model 4, our result indicates that one standard deviation increase in *P_EM* leads to a 0.30% ($= 1.22 \times 0.2494\%$) increase in market leverage.[22] Moreover, given that the average market

[18] In the robustness section, we also use a specification where we include the growth rate of GDP and of equity market capitalization only.

[19] The data of Taiwan is collected from the websites of National Statistic of Taiwan and Taiwan Stock Exchange.

[20] The sample starts from 1989 since some accounting data are not available prior to 1989 in Worldscope.

[21] To address a concern that our results may be driven by firm-years from developed countries, we test our hypotheses separately for developed countries, developing countries, and a subsample excluding the U.S., the U.K., and Japan as robustness checks.

[22] We scale *Accr, Smth, Corr and P_EM* by 100 in all multivariate regressions. Thus, the coefficient estimates of earnings-management measures and their interactions with institutional-environment variables should be interpreted as percentage. For example, Model 4 of Table 5 shows that the coefficient estimate of *P_EM* is 0.2494. It indicates that one unit increase in *P_EM* increases market leverage by 0.2494%.

Table 2
Descriptive statistics: This table presents the descriptive statistics of firm-, industry- (Panel A), country-level (Panel B), and institutional-environment variables (Panel C). The sample period is from 1989 to 2009. Summary statistics in Panel A are based on a panel of firm-year observations, in Panel B based on a panel of country-year observations and in Panel C based on a cross section of countries. All variables are defined in Appendix A.

	N [1]	Mean [2]	Median [3]	Std. Dev. [4]	Min. [5]	Max. [6]
Panel A: Firm- and industry-level variables						
ML	166,163	0.27	0.22	0.25	0.00	1.00
BL	166,163	0.23	0.21	0.19	0.00	1.00
Accr	166,163	1.20	0.70	1.84	0.10	22.93
Smth	166,163	−0.66	−0.59	0.42	−2.97	−0.04
Corr	145,470	0.77	0.93	0.34	−0.89	1.00
P_EM	145,470	0.03	0.37	1.22	−6.75	1.55
Tang	166,163	0.32	0.29	0.22	0.00	0.94
Prof	166,163	0.09	0.10	0.14	−0.69	0.47
Size	166,163	12.52	12.43	1.90	4.87	17.92
MTB	166,163	1.30	0.93	1.48	0.09	26.88
IndMed (ML)	166,163	0.23	0.21	0.16	0.00	0.98
IndMed (BL)	166,163	0.20	0.20	0.10	0.00	0.86
Panel B: Country-level control variables						
GDPC	712	4.10	4.31	0.53	2.57	4.98
GGDP	712	3.65	3.53	3.08	−13.13	14.20
MCAP	712	79.74	59.30	71.48	4.47	617.05
GCAP	686	17.17	14.31	43.46	−76.42	277.64
Panel C: Institutional-environment variables						
LegCom	35	0.40	0.00	0.50	0.00	1.00
P_Enfor	35	0.80	1.53	1.88	−3.61	2.80
P_SH	35	0.35	0.24	1.24	−1.64	2.44
P_Acct	32	0.16	0.48	1.14	−2.34	1.76
P_K09	37	1.87	2.30	1.42	−1.35	3.46
P_K04	37	1.57	1.95	2.28	−3.05	4.70

leverage in our sample is about 0.27, a 0.30% increase accounts for a 1.11% (= 0.30%/0.27) change of market leverage for an average firm in the sample.

These results are in support of **H1**. That is, when earnings management is used as a proxy for information asymmetry between corporate insiders and outside investors, these results indicate that higher earnings management activities increase the demand for debt as an external control mechanism in reducing the agency cost of free cash flows.

Table 5 also shows that the coefficient estimates of *Tang* in all regressions are positively significant at one percent level. It indicates that the firms with more tangible assets have lower expected distress cost. Thus, they tend to have higher financial leverage. *Prof* is negatively significant at one percent level. It is consistent with pecking order theory which suggests that profitable firms rely on internal finance over external funds. *Size* is positively significant at one percent level. It indicates that larger firms that have lower default risk with better reputation tend to have higher financial leverage. *MTB* is negatively significant at one percent level. It shows that growth firms face higher financial distress cost. *IndMed* is positively significant at one percent level. It indicates that managers tend to use industry-median leverage as a benchmark as they build their own capital structures. In sum, the results of the firm and industry characteristics are consistent with Titman and Wessels (1988), Lemmon et al. (2008), Antoniou et al. (2008) and Fan et al. (2012).

Next, we examine the empirical model (Eq. (1)) in Section 3 to assess the following research question: whether the leverage sensitivity to earnings management is influenced by macro-level institutional environments. In Table 6, we include eight different specifications. In the models labeled by odd numbers (i.e., Models 1, 3, 5, and 7), we have one of our four earnings-management variables (*Accr, Smth, Corr*, and *P_EM*) and the interaction between it and macro-level institutional-environment variable ($EM \times IE$). In the other models labeled by even numbers (i.e., Models 2, 4, 6, and 8), we control for additional interactions between an institutional-environment variable and firm, industry, and country characteristics ($\mathbf{X} \times IE$ and $\mathbf{Y} \times IE$). By doing so, in estimating how legal origin affects the relation between earnings management and financial leverage, we control for the role of legal origin in affecting the relations between financial leverage and other financial-leverage determinants. Control variables are included in the estimations but not reported in the table for brevity.

Table 3
Earnings-management measures: This table provides a description of the country median of earnings-management measures (*Accr*, *Smth*, *Corr*, and *P_EM*). All variables are defined in Appendix A.

Market	*Accr* [1]	*Smth* [2]	*Corr* [3]	*P_EM* [4]
Australia	0.60	−0.69	0.90	0.14
Austria	0.83	−0.36	0.98	0.90
Belgium	0.73	−0.50	0.96	0.62
Canada	0.64	−0.66	0.90	0.19
China	0.90	−0.35	0.98	0.90
Chile	0.52	−0.49	0.96	0.63
Denmark	0.63	−0.45	0.96	0.72
Ireland	0.50	−0.54	0.94	0.53
Finland	0.64	−0.55	0.94	0.52
France	0.71	−0.52	0.95	0.55
Germany	0.88	−0.48	0.95	0.63
Greece	0.91	−0.35	0.98	0.93
Hong Kong	0.80	−0.60	0.92	0.34
Indonesia	0.76	−0.57	0.94	0.42
India	0.65	−0.48	0.96	0.59
Israel	0.74	−0.57	0.93	0.42
Italy	0.77	−0.46	0.96	0.70
Japan	0.70	−0.53	0.94	0.52
South Korea	0.84	−0.54	0.94	0.50
Malaysia	0.89	−0.49	0.95	0.58
Netherlands	0.58	−0.47	0.96	0.68
Norway	0.83	−0.63	0.89	0.24
New Zealand	0.54	−0.51	0.96	0.58
Pakistan	0.59	−0.49	0.95	0.64
Poland	0.84	−0.51	0.95	0.52
Portugal	0.95	−0.40	0.98	0.84
Philippines	0.85	−0.50	0.95	0.55
South Africa	0.46	−0.62	0.92	0.34
Singapore	0.82	−0.52	0.95	0.55
Spain	0.66	−0.49	0.96	0.61
Sweden	0.67	−0.68	0.90	0.17
Switzerland	0.59	−0.47	0.96	0.66
Thailand	0.74	−0.56	0.94	0.41
Turkey	0.72	−0.59	0.92	0.36
Taiwan	0.78	−0.53	0.94	0.52
United Kingdom	0.58	−0.64	0.91	0.27
United States	0.64	−0.74	0.86	−0.04
Mean	0.72	−0.53	0.94	0.52
Median	0.72	−0.52	0.95	0.54
Std. Dev.	0.13	0.09	0.03	0.22
Min.	0.46	−0.74	0.86	−0.04
Max.	0.95	−0.35	0.98	0.93

Our first institutional-environment variable is *LegCom* which is a dummy variable equals to one if the country's legal system is based on common law, and zero otherwise. Panel A of Table 6 shows the regression results. In particular, Models 1, 3, 5, and 7 show that the coefficient estimates of earnings-management variables are positively significant at one percent level. Specifically, the coefficient estimates (t-statistics) of *Accr*, *Smth*, *Corr*, and *P_EM* are 0.3455 (9.4210), 1.1904 (5.2806), 1.1495 (2.7682), and 0.4739 (4.0878), respectively. The results in Models 2, 4, 6, and 8 are qualitatively unchanged. In sum, for different earnings management used above, we document significant results that are consistent with **H1** that firms with higher level of earnings management tend to have higher financial leverage.

Next, we turn to examine how institutional environments reshape the financial leverage sensitivity to earnings management

Table 4
Correlation matrix – firm- and industry-level variables: This table provides the correlation matrix for pairs of firm- and industry-level variables. All variables are defined in Appendix A.

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
ML	[1]	1.00											
BL	[2]	0.81	1.00										
Accr	[3]	0.09	0.06	1.00									
Smth	[4]	0.12	0.07	−0.02	1.00								
Corr	[5]	0.10	0.05	−0.02	0.60	1.00							
P_EM	[6]	0.12	0.07	−0.06	0.90	0.89	1.00						
Tang	[7]	0.22	0.26	−0.06	−0.02	−0.03	−0.03	1.00					
Prof	[8]	−0.11	−0.07	−0.12	0.08	0.09	0.09	0.13	1.00				
Size	[9]	0.19	0.20	−0.12	0.08	0.07	0.09	0.16	0.25	1.00			
MTB	[10]	−0.30	−0.11	−0.04	−0.11	−0.11	−0.12	−0.10	−0.01	−0.15	1.00		
IndMed(ML)	[11]	0.43	0.30	0.01	0.13	0.13	0.15	0.24	0.03	0.18	−0.29	1.00	
IndMed(BL)	[12]	0.37	0.37	−0.02	0.12	0.12	0.14	0.30	0.12	0.22	−0.19	0.80	1.00

Table 5
Leverage on earnings management determinants: This table presents the coefficient estimates of market leverage (*ML*) on earnings-management variables (*Accr*, *Smth*, *Corr*, and *P_EM*). Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) are controlled in each regression. All regressions include firm- and year-fixed effects. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	[1]	[2]	[3]	[4]
Accr	0.2522***			
	(5.7574)			
Smth		0.6867***		
		(4.0992)		
Corr			0.6105***	
			(3.1691)	
P_EM				0.2494***
				(4.0229)
Tang	0.1276***	0.1279***	0.1263***	0.1267***
	(8.8416)	(8.7918)	(9.5538)	(9.5809)
Prof	−0.2012***	−0.2030***	−0.2081***	−0.2085***
	(−10.2405)	(−10.1768)	(−10.8645)	(−10.8560)
Size	0.0728***	0.0720***	0.0722***	0.0720***
	(7.4374)	(7.4142)	(7.0258)	(7.0504)
MTB	−0.0071***	−0.0071***	−0.0085***	−0.0085***
	(−8.8226)	(−8.8019)	(−9.4184)	(−9.3798)
IndMed	0.3171***	0.3177***	0.3048***	0.3049***
	(16.5434)	(16.6900)	(16.8914)	(16.9079)
GDPC	−0.0952*	−0.0934*	−0.0726	−0.0724
	(−1.7879)	(−1.7632)	(−1.4466)	(−1.4469)
MCAP	−0.0002***	−0.0002***	−0.0002***	−0.0002***
	(−3.9262)	(−3.9155)	(−3.6730)	(−3.6662)
GGDP	0.0011	0.0011	0.0008	0.0008
	(0.7963)	(0.7879)	(0.5713)	(0.5656)
Intercept	−0.3146	−0.3056	−0.4024**	−0.3965**
	(−1.6058)	(−1.5624)	(−2.1763)	(−2.1423)
Adj.R^2	0.7445	0.7444	0.7494	0.7495
N	166,163	166,163	145,470	145,470

across countries. In particular, our focus here is the interaction between earnings management and a country's legal origin. Panel A of Table 6 shows that the coefficient estimates of *EM* × *LegCom* in all specifications are negatively significant (except for Models 6 and 8 where the coefficient estimates are insignificantly negative). In particular, the coefficient estimates (t-statistics) of *EM* × *LegCom* in Models 1, 3, 5, and 7 are −0.1502 (−2.0711), −1.0410 (−3.5639), −0.8664 (−1.8371), and −0.4055 (−2.8985), respectively. The results are economically significant across different earnings-management measures. For example, Model 7 shows that the coefficient estimates of *P_EM* and *P_EM* × *LegCom* are 0.4739 and −0.4055, respectively. It indicates that one standard deviation increase in *P_EM* leads to a 0.58% (= 1.22 × 0.4739%) increase in market leverage for civil law countries (*LegCom* = 0). In addition, the above relation is reduced by 0.4055% for common law countries (*LegCom* = 1) as opposed to civil law countries, *ceteris paribus*. That is, one standard deviation increase in *P_EM* leads to a 0.08% (= 1.22 × (0.4739% − 0.4055% × 1)) increase in market leverage. We obtain qualitatively indifferent results in Models 2, 4, 6, and 8 after controlling for $X \times IE$ and $Y \times IE$ in the regressions.

The results are consistent with **H2a** that financial leverage tends to be less positively correlated with earnings management in countries based on common law than civil law. La Porta et al. (1998) suggest that the countries with legal systems based on common law provide better investor protection than those based on civil law countries. Thus, it is more difficult for managers to expropriate investments from investors in common law countries. Therefore, the common law legal system provides a better controlling mechanism than civil law, and reduces the demand for "costly" debt in mitigating agency conflicts.

In addition, Panel A of Table 6 examines **H2** by using *P_Enfor* as an alternative institutional-environment variable. The coefficient estimates of the interactions between earnings management (*Smth*, *Corr*, and *P_EM*) and *P_Enfor* are negatively significant. Specifically, the coefficient estimates (t-statistics) of interactions in Models 3, 5, and 7 are −0.4100 (−1.7201), −0.7005 (−2.5279), and −0.2114 (−2.2146), respectively. Similar to *LegCom*, *P_Enfor* also plays an economically significant role in reshaping earnings management – financial leverage sensitivity. For example, Model 7 shows that the coefficient estimates of *P_EM* and *P_EM* × *P_Enfor* are 0.6225 and −0.2144, respectively. Given the 25 and 75 percentile of *P_Enfor* are −1.75 and 2.18, respectively. The results indicate that, for the countries with relative low enforcement (25 percentile of *P_Enfor*), one standard deviation increase in *P_EM* leads market leverage to increase to about 1.22% (= 1.22 × (0.6225% − 0.2144% × (−1.75))). In contrast, for the countries with relative high enforcement (75 percentile of *P_Enfor*), one standard deviation increase in *P_EM* leads market leverage to increase to only 0.19% (= 1.22 × (0.6225% − 0.2144% × 2.18)). The results are qualitatively unchanged by controlling $X \times IE$ and $Y \times IE$ in the regressions.

Put all together, these results confirm the role of enforcement in reshaping the impact of earnings management on capital-structure decisions. They show that financial leverage tends to be less positively correlated with earnings management in countries with stronger legal enforcement. These results are in accordance with the notions that strong legal enforcement enforces investors' rights in time of need, and mitigates the agency conflicts with no incremental costs. Thus, the relation between earnings management and financial leverage is less pronounced in the countries with strong legal enforcement.

In sum, we document two novel findings that support our hypotheses (**H1** and **H2a**) in Section 2. Precisely, we find that leverage ratios increase in earnings management activities and this positive relation is attenuated in counties with strong institutional

Table 6
The role of institutional environments: This table presents the coefficient estimates of market leverage (*ML*) on earnings-management variable (*Accr*, *Smth*, *Corr*, and *P_EM*) and its interaction with institutional-environment variable (*EM* × *IE*). The institutional-environment variables include a common law dummy (*LegCom*) in Panel A and an enforcement index (*P_Enfor*) in Panel B. Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) are controlled in each regression (even number models include the interactions of all control variables and institutional-environment variable (*X* × *IE* and *Y* × *IE*)), but their coefficients are omitted for brevity. All regressions include firm- and year-fixed effects. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Panel A								
Accr	0.3455***	0.3506***						
	(9.4210)	(10.5619)						
Accr × *LegCom*	−0.1502**	−0.1715**						
	(−2.0711)	(−2.3229)						
Smth			1.1904***	0.9664***				
			(5.2860)	(5.1053)				
Smth × *LegCom*			−1.0410***	−0.7011**				
			(−3.5639)	(−2.6585)				
Corr					1.1495***	0.6855*		
					(2.7682)	(1.8616)		
Corr × *LegCom*					−0.8664*	−0.2015		
					(−1.8371)	(−0.4465)		
P_EM							0.4739***	0.3442***
							(4.0878)	(3.4566)
P_EM × *LegCom*							−0.4055***	−0.2141
							(−2.8985)	(−1.6291)
Intercept	−0.5021***	−0.4996***	−0.4857***	−0.4860***	−0.5617***	−0.5550***	−0.5504***	−0.5451***
	(−3.4652)	(−3.1907)	(−3.3208)	(−3.0741)	(−3.9850)	(−3.7403)	(−3.8810)	(−3.6532)
Adj.R^2	0.7472	0.7490	0.7470	0.7488	0.7520	0.7538	0.7520	0.7538
N	159,969	159,969	159,969	159,969	140,580	140,580	140,580	140,580
Panel B								
Accr	0.1980**	0.2029**						
	(2.1637)	(2.3381)						
Accr × *P_Enfor*	0.0384	0.0353						
	(0.9119)	(0.8866)						
Smth			1.3383***	1.1614**				
			(2.7574)	(2.7216)				
Smth × *P_Enfor*			−0.4100*	−0.3135				
			(−1.7201)	(−1.5194)				
Corr					1.9127***	1.7248***		
					(3.1793)	(3.2976)		
Corr × *P_Enfor*					−0.7005**	−0.5997**		
					(−2.5279)	(−2.3972)		
P_EM							0.6225***	0.5603***
							(3.1153)	(3.1799)
P_EM × *P_Enfor*							−0.2114**	−0.1785**
							(−2.2146)	(−2.1035)
Intercept	−0.5023***	−0.5538***	−0.4919***	−0.5439***	−0.5667***	−0.6153***	−0.5604***	−0.6090***
	(−3.4724)	(−3.2401)	(−3.3592)	(−3.1361)	(−4.0061)	(−3.7505)	(−3.9260)	(−3.6786)
Adj.R^2	0.7471	0.7479	0.7470	0.7477	0.7520	0.7527	0.7520	0.7527
N	159,969	159,969	159,969	159,969	140,580	140,580	140,580	140,580

environments, in particular, common law legal system and strong enforcement.

6. Endogeneity issues and robustness tests

This section presents our robustness checks. First, we re-examine **H1** but control for various ownership concentration measures. Second, we address the endogeneity concern by using an instrumental-variable approach based on either two-stage least squares (2SLS) or generalized method of moments (GMM). Further, we re-estimate our model by employing (1) different estimation techniques (i.e., dynamic model (Flannery and Rangan, 2006) and doubly-censored Tobit model (Elsas and Florysiak, forthcoming)), (2) different samples of countries, (3) different measures of leverage, and (4) different institutional-environment proxies.

6.1. Leverage on earnings management determinants – control for ownership concentration

H1 argues that financial leverage serves as an external control mechanism in reducing the agency conflicts, particularly, for firms with severe earnings manipulations. This argument is based on an assumption that the ownership of a firm is usually separated from its control (Rajan and Zingales, 1995). While this assumption appears to be plausible for some firms, it does not necessarily hold for all the sample firms. In this subsection, we address this concern by controlling for corporate ownership concentration measures. As the agency conflicts among firms with "separation of ownership and control" are less severe for firms with concentrated ownership structures, we expect that ownership concentration tend to alleviate the role of debt in mitigating agency conflicts.

In particular, we add an ownership concentration indicator variable (*OC*) and the interaction between it and an earnings management variable (*OC* × *EM*) to the models in Table 5. We expect *OC* × *EM* < 0. More specifically, we employ four ownership concentration proxies, including a "closely held shares" dummy variable (*Close*) equals to one if the ratio of number of shares held by insiders to common shares outstanding is above country median in a given year, a "top 5 ownership" dummy variable (*Top*5) equals to one if the ownership by top 5 institutional investors in percentage of market capitalization is above country median in a given year, and two "blockholder ownership" dummy variables

Table 7
Leverage on earnings management determinants – Control ownership concentration: This table presents the coefficient estimates of market leverage (*ML*) on earnings-management variables (*Accr*, *Smth*, *Corr*, and *P_EM*). Ownership variable include *Close, Top5, Blockholder_1%, and Blockholder_5%.* Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) are controlled in each regression, but their coefficients are omitted for brevity. All regressions include year-fixed effect. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	[1]	[2]	[3]	[4]		[1]	[2]	[3]	[4]
	Panel A					*Panel B*			
Accr	0.9841***				*Accr*	1.1665***			
	(5.7733)					(10.5580)			
Accr × *Close*	0.3409				*Accr* × *Top5*	−0.2032			
	(1.5915)					(−0.9065)			
Smth		3.6713***			*Smth*		4.0860***		
		(8.0397)					(7.0162)		
Smth × *Close*		−0.7487*			*Smth* × *Top5*		−1.6090***		
		(−1.8697)					(−2.9715)		
Corr			3.2071***		*Corr*			3.5796***	
			(6.9543)					(5.3422)	
Corr × *Close*			−1.0065**		*Corr* × *Top5*			−1.3457**	
			(−2.4767)					(−2.2835)	
P_EM				1.1433***	*P_EM*				1.2573***
				(7.5197)					(6.3301)
P_EM × *Close*				−0.3116***	*P_EM* × *Top5*				−0.4813***
				(−2.8180)					(−2.7299)
Close	−0.0034	−0.0053	0.0079	−0.0001	*Top5*	−0.0378*	−0.0518***	−0.0309	−0.0412**
	(−0.2899)	(−0.4042)	(0.6780)	(−0.0072)		(−1.9891)	(−3.2583)	(−1.5647)	(−2.4718)
Intercept	−0.0222	0.0238	−0.0236	−0.0003	*Intercept*	−0.0402	0.0096	−0.0457	−0.0187
	(−0.5318)	(0.5107)	(−0.4902)	(−0.0054)		(−0.8022)	(0.2002)	(−0.8699)	(−0.3735)
Adj.R^2	0.2947	0.2906	0.2890	0.2899	*Adj.*R^2	0.2964	0.2933	0.2926	0.2934
N	107,754	107,754	107,503	107,503	*N*	71,249	71,249	71,111	71,111
	Panel C					*Panel D*			
Accr	1.1736***				*Accr*	1.1902***			
	(13.2642)					(9.3907)			
Accr × *Blockholder_1%*	−0.2349*				*Accr* × *Blockholder_5%*	−0.3256***			
	(−1.9059)					(−2.9279)			
Smth		3.8604***			*Smth*		3.5803***		
		(6.8461)					(8.3169)		
Smth × *Blockholder_1%*		−1.1562*			*Smth* × *Blockholder_5%*		−0.9018*		
		(−1.9974)					(−1.6942)		
Corr			3.3659***		*Corr*			3.1387***	
			(4.7659)					(4.7014)	
Corr × *Blockholder_1%*			−0.9379		*Corr* × *Blockholder_5%*			−0.7303	
			(−1.4170)					(−0.8549)	
P_EM				1.1793***	*P_EM*				1.0976***
				(5.7260)					(6.3213))
P_EM × *Blockholder_1%*				−0.3269	*P_EM* × *Blockholder_5%*				−0.2492
				(−1.6482)					(−1.0939)
Blockholder_1%	−0.0344**	−0.0459***	−0.0312*	−0.0383***	*Blockholder_5%*	−0.0064	−0.0160**	−0.0047	−0.0101**
	(−2.6782)	(−4.2137)	(−2.0027)	(−3.2194))		(−1.6148)	(−2.4673)	(−0.7759)	(−2.6275)
Intercept	−0.0433	0.0048	−0.0475	−0.0222	*Intercept*	−0.0361	0.0105	−0.0383	−0.0147
	(−0.8163)	(0.0947)	(−0.8354)	(−0.4140)		(−0.6732)	(0.2008)	(−0.6647)	(−0.2701)
Adj.R^2	0.2954	0.2923	0.2916	0.2924	*Adj.*R^2	0.2905	0.2869	0.2862	0.2870
N	71,249	71,249	71,111	71,111	*N*	71,249	71,249	71,111	71,111

(*Blockholder*1% (*Blockholder*5%)) equal to one if the ownership by institutional blockholders greater than 1% (5%) in percentage of market capitalization is above country median in a given year. Panel A of Table 7 shows that *Close* × *EM* are negatively significant in Models 2–4. The results are qualitatively consistent in Panels B, C, and D which employs alternative ownership concentration indicator variables (*Top*5, *Blockholder*1%, and *Blockholder*5%). We also examine all regressions in Table 7 by including both firm- and year-fixed effects and obtain qualitatively indifferent results. The results confirm our expectation that the role of debt in dealing with agency conflicts is more pronounced among firms with "separation of ownership and control".

6.2. Instrumental variables

In our model there is an endogeneity concern because it is unclear whether the causality comes from earnings management to leverage or the other way around. To address this problem, we use instrumental-variable regressions (two-stage least squares (2SLS) and generalized method of moments (GMM) estimators). Our identification strategy is described as follows. To identify the effect of earnings management on leverage choice, we need an exogenous (instrumental) variable that determines the earnings management activities of an individual firm but is not (directly) correlated with its leverage choice. To this end, we consider peer-firm industry-level earnings management as a candidate. Based on an argument that there seems to be a peer-firm effect on earnings management, we expect that peer-firm industry-level earnings management is a strong predictor of firm's own earnings management.[23] Equally important, while firm's leverage choice can affect its earnings management, its leverage choice is

[23] *IndMean(EM)* of firm *i* is the mean of earnings-management measure of all firms in the industry except firm *i*.

Table 8
Leverage on earnings management determinants – Instrument-variables regressions: This table presents the coefficient estimates of market leverage (*ML*) on earnings-management variables (*Accr*, *Smth*, *Corr*, and *P_EM*) by employing two-stage least squares (2SLS) (Models 1 to 4) and generalized method of moments (GMM) estimators (Models 5 to 8). Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) are controlled in each regression. *IndMean(EM)* (Peer-firm industry-median of earnings-management variables) is used as instrumental variables. All regressions include year-fixed effects. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each firm. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	2SLS				*GMM*			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Accr	1.3975***				1.4982***			
	(18.0562)				(19.2010)			
Smth		5.0216***				4.8694***		
		(14.3438)				(13.9894)		
Corr			3.7915***				3.3999***	
			(9.2194)				(8.3202)	
P_EM				1.3373***				1.2725***
				(11.5074)				(11.0098)
Tang	0.1473***	0.1501***	0.1502***	0.1525***	0.1566***	0.1576***	0.1598***	0.1620***
	(22.9948)	(23.3595)	(21.6105)	(21.9772)	(25.4036)	(25.4979)	(23.8139)	(24.1852)
Prof	−0.2978***	−0.3257***	−0.3486***	−0.3505***	−0.2574***	−0.2785***	−0.2989***	−0.3013***
	(−41.0080)	(−43.7441)	(−41.5039)	(−41.7213)	(−38.8265)	(−41.1374)	(−39.2260)	(−39.5205)
Size	0.0164***	0.0147***	0.0147***	0.0146***	0.0154***	0.0133***	0.0132***	0.0131***
	(22.0533)	(19.8531)	(18.6584)	(18.4657)	(21.0433)	(18.1862)	(16.9272)	(16.7832)
MTB	−0.0354***	−0.0350***	−0.0370***	−0.0366***	−0.0349***	−0.0352***	−0.0373***	−0.0368***
	(−31.7037)	(−31.3429)	(−27.8767)	(−27.7755)	(−32.1730)	(−31.9912)	(−28.5409)	(−28.4159)
IndMed	0.5059***	0.4946***	0.4906***	0.4865***	0.4707***	0.4620***	0.4535***	0.4500***
	(51.6330)	(50.1781)	(45.8438)	(45.5231)	(52.6375)	(51.4429)	(46.5238)	(46.2522)
GDPC	0.0036	0.0065	0.0119**	0.0127***	0.0009	0.0062	0.0104**	0.0125***
	(0.8055)	(1.4563)	(2.4230)	(2.5811)	(0.2424)	(1.5517)	(2.3738)	(2.8415)
MCAP	−0.0000	−0.0000	−0.0000	−0.0000	0.0000	0.0000	0.0000	0.0000
	(−1.3303)	(−1.0156)	(−1.3997)	(−1.2797)	(0.0805)	(0.1414)	(0.1659)	(0.2598)
GGDP	−0.0005	−0.0006	−0.0002	−0.0003	−0.0002	−0.0002	0.0007	0.0005
	(−0.9335)	(−1.1954)	(−0.3648)	(−0.5936)	(−0.4994)	(−0.5827)	(1.4786)	(1.1627)
Intercept	−0.0767***	−0.0166	−0.0989***	−0.0714***	−0.0585***	−0.0020	−0.0760***	−0.0575***
	(−3.5351)	(−0.7632)	(−4.0485)	(−2.9840)	(−2.9660)	(−0.1003)	(−3.4146)	(−2.6446)
Adj.R^2	0.2875	0.2837	0.2828	0.2837	0.2856	0.2822	0.2807	0.2817
N	129,136	129,136	113,187	113,187	129,136	129,136	113,187	113,187

unlikely to affect all other firms' earnings management in the same industry.[24]

Table 8 reports the results of instrumental-variables regressions of estimating how earnings management affects financial leverage. The results are consistent with **H1**. That is, by employing two-stage least squares (2SLS) (Models 1–4) and generalized method of moments (GMM) (Models 5–8) estimators, higher earnings management activities increase the demand for debt as an external control mechanism.

Table 9 reports the result of two-stage least squares and generalized method of moments regressions of estimating how institutional environments (*LegCom* in Panel A and *P_Enfor* in Panel B) affect the positive relation between earnings management and leverage. The results are consistent with **H2a**. That is, the positive association between earnings management and leverage ratio is attenuated in countries with strong institutional environments.

6.3. Further arguments and analysis in endogeneity issues

In addition, we conduct the following analyses to further assure that endogeneity and reverse causality may not be a major problem of our main conclusions. First, due to the inclusion of firm-fixed effect, it is unlikely that our results are merely reflective of the unmodeled differences across firms. We argue that the possible association of high leverage and high earnings management in some firms do not likely drive the results, because the evidence still exists in a within-firm test. Second, we employ extensive control variables in our analysis by following the existing literature to take into account the endogeneity issues for earnings management. In addition, we include year-fixed effects to account for other unobservable time-varying factors. Third, we use the previous five years' accounting data to construct our earnings-management variables and lag them by one year in our leverage regressions. The similar conclusions drawn by employing lagged earnings management suggest that our testing results do not suffer from the influences of an unobservable variable driving both leverage and earnings management.

6.4. Dynamic model

Up to now, we have focused on the regression models that do not include the lagged dependent variable and, therefore, do not account for the dynamics of leverage over time. The approach can be justified in either of the two following situations. First, we are interested in the effect of earnings management on the *observed* leverage. Second, we are indeed interested in analyzing the effect on the *target* leverage but we assume firms choose their target leverages each year. Having said that, the current approach becomes less appealing if one would like to test our hypotheses in a dynamic setting where firms can (temporarily) deviate from their target leverages. To properly examine the effect of earnings management with dynamic leverage adjustments, we follow Flannery and Rangan (2006) and extend our analyses to a dynamic framework as follows:

$$\begin{aligned} ML_{j,i,t} = {} & \alpha + \lambda_1 ML_{j,i,t-1} + \lambda_2 ML_{j,i,t-1} \times IE_j + \pi_{11} EM_{j,i,t-1} \\ & + \pi_{21} EM_{j,i,t-1} \times IE_j + \boldsymbol{\pi}_{12} \mathbf{X}_{j,i,t-1} + \boldsymbol{\pi}_{22} \mathbf{X}_{j,i,t-1} \times IE_j \\ & + \boldsymbol{\pi}_{13} \mathbf{Y}_{j,t-1} + \boldsymbol{\pi}_{23} \mathbf{Y}_{j,t-1} \times IE_j + f_i + y_t + e_{j,i,t}, \end{aligned} \quad (2)$$

[24] Nevertheless, firm's leverage and industry-level earnings management may be correlated because of a peer-firm effect on leverage (Leary and Roberts, 2014). To address this concern, we control for industry median leverage in all specifications.

Table 9
The role of institutional environments – Instrument-variables regressions: This table presents the coefficient estimates of market leverage (*ML*) on earnings-management variable (*Accr*, *Smth*, *Corr*, and *P_EM*) and its interaction with institutional-environment variable (*EM* × *IE*) by employing two-stage least squares (2SLS) (Models 1 to 4) and generalized method of moments (GMM) estimators (Models 5 to 8). The institutional-environment variables include a common law dummy (*LegCom*) in Panel A and an enforcement index (*P_Enfor*) in Panel B. Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) and their interactions with institutional-environment variable (*X* × *IE* and *Y* × *IE*)) are controlled in each regression, but their coefficients are omitted for brevity. *IndMean(EM)* (Peer-firm industry-median of earnings-management variables) is used as instrumental variables. All regressions include year-fixed effect. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each firm. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	2SLS				*GMM*			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Panel A								
Accr	1.8177***				1.9385***			
	(13.1710)				(13.8820)			
Accr × *LegCom*	−0.7779***				−0.8354***			
	(−4.9759)				(−5.2747)			
Smth		6.8538***				6.5759***		
		(10.8794)				(10.5043)		
Smth × *LegCom*		−3.1669***				−3.0980***		
		(−4.8861)				(−4.8150)		
Corr			4.6467***				3.7052***	
			(5.3437)				(4.2925)	
Corr × *LegCom*			−1.3987				−0.6903	
			(−1.5976)				(−0.7933)	
P_EM				1.7077***				1.5503***
				(7.7044)				(7.0349)
P_EM × *LegCom*				−0.5912**				−0.4998**
				(−2.5493)				(−2.1664)
Intercept	−0.0477**	0.0136	−0.0662**	−0.0381	−0.0423*	0.0200	−0.0567**	−0.0362
	(−2.0315)	(0.5735)	(−2.5554)	(−1.4946)	(−1.8563)	(0.8691)	(−2.2691)	(−1.4705)
Adj.R^2	0.2969	0.2928	0.2925	0.2933	0.2953	0.2916	0.2911	0.2918
N	124,855	124,855	109,915	109,915	124,855	124,855	109,915	109,915
Panel B								
Accr	1.6833***				1.8256***			
	(9.9726)				(10.4506)			
Accr × *P_Enfor*	−0.1732**				−0.2032***			
	(−2.3118)				(−2.5954)			
Smth		9.6626***				9.4262***		
		(11.4233)				(11.1427)		
Smth × *P_Enfor*		−2.4621***				−2.4435***		
		(−7.2463)				(−7.1771)		
Corr			6.5737***				5.8619***	
			(5.7249)				(5.1216)	
Corr × *P_Enfor*			−1.4048***				−1.2702***	
			(−3.0266)				(−2.7414)	
P_EM				2.4462***				2.3742***
				(8.1879)				(7.9171)
P_EM × *P_Enfor*				−0.5593***				−0.5708***
				(−4.5616)				(−4.6196)
Intercept	−0.2436***	−0.1330***	−0.3075***	−0.2504***	−0.2539***	−0.1557***	−0.3370***	−0.2917***
	(−5.4482)	(−2.9597)	(−6.1114)	(−5.1439)	(−5.8348)	(−3.5551)	(−6.8659)	(−6.1492)
Adj.R^2	0.2922	0.2870	0.2874	0.2879	0.2905	0.2856	0.2857	0.2862
N	124,855	124,855	109,915	109,915	124,855	124,855	109,915	109,915

where λ_1 is equal to one minus the speed of leverage adjustment if $IE = 0$ and $\lambda_1 + \lambda_2$ is equal to one minus the speed of leverage adjustment if $IE = 1$.

We then compute the effect of earnings management through

$$\beta = (\pi_{11} + \pi_{21} \times IE_j)/(1 - \lambda_1 - \lambda_2 \times IE_j). \quad (3)$$

More specifically, if $IE_j = 1$,

$$\beta_{LegCom=1} = (\pi_{11} + \pi_{12})/(1 - \lambda_1 - \lambda_2) \quad (4)$$

and if $IE_j = 0$,

$$\beta_{LegCom=0} = \pi_{11}/(1 - \lambda_1). \quad (5)$$

For clarity sake, we decide to stay in this framework where IE_j is a dummy variable. It is evident that our first institutional environment variable *LegCom* is already binary as it can only takes value of one or zero. In addition, we create an enforcement dummy variable (*P_Enfor_dum*) which equals to one if the enforcement index is above country median, and zero otherwise.

We use the system-GMM method to estimate the dynamic capital structure adjustment models (Blundell and Bond, 1998). Panel A of Table 10 summarizes the results of dynamic model using *LegCom*. The results in Models 1–4 show that the magnitudes of $\beta_{LegCom=0}$ are larger than those of $\beta_{LegCom=1}$. For instance, using the coefficient estimators in Model 4, we find that $\beta_{LegCom=0}$ is 1.8610 as opposed to $\beta_{LegCom=1}$ which is only 1.4166 (see the final two rows of Table 10 for details). It indicates that the impact of earnings management on financial leverage is reduced in counties adopting a common law legal system. Panel B of Table 10 shows that the results are consistent with Panel A except Model 3.

6.5. Subsamples

In our sample, a substantial fraction of the firm population come from the U.S., the U.K., and Japan. Thus, our results may be driven by disproportionately many firm-year observations from

Table 10
Dynamic model: This table presents the coefficient estimates of market leverage (*ML*) on earnings-management variable (*Accr*, *Smth*, *Corr*, and *P_EM*) and its interaction with institutional-environment variable (*EM* × *IE*). The institutional-environment variables include a common law dummy (*LegCom*) in Panel A and an enforcement dummy (*P_Enfo_dum*) in Panel B. Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) and their interactions with institutional-environment variable (*X* × *IE* and *Y* × *IE*)) are controlled in each regression, but their coefficients are omitted for brevity. All regressions include year-fixed effect. *P*-values and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	[1]	[2]	[3]	[4]		[1]	[2]	[3]	[4]
	Panel A				*Panel B*				
Accr	0.2892***				*Accr*	0.3964***			
	(7.1479)					(5.5759)			
Accr × *LegCom*	−0.0031				*Accr* × *P_Enfor_dum*	−0.1666**			
	(−0.0554)					(−2.1579)			
Smth		1.7460***			*Smth*		2.5873***		
		(11.3355)					(8.4643)		
Smth × *LegCom*		−0.1587			*Smth* × *P_Enfor_dum*		−1.1530***		
		(−0.7404)					(−3.5477)		
Corr			1.3430***		*Corr*			1.9876***	
			(6.5989)					(5.1825)	
Corr × *LegCom*			0.0158		*Corr* × *P_Enfor_dum*			−0.7693*	
			(0.0621)					(−1.9162)	
P_EM				0.5372***	*P_EM*				0.8045***
				(9.6700)					(7.3977)
P_EM × *LegCom*				−0.0423	*P_EM* × *P_Enfor_dum*				−0.3569***
				(−0.5767)					(−3.1118)
ML_lag	0.7153***	0.7131***	0.7113***	0.7114***	*ML_lag*	0.5486***	0.5428***	0.5451***	0.5431***
	(51.9775)	(51.7967)	(51.4025)	(51.4875)		(24.5201)	(24.0548)	(24.1177)	(24.0119)
ML_lag × *LegCom*	−0.0591***	−0.0619***	−0.0602***	−0.0607***	*ML_lag* × *P_Enfor_dum*	0.1895***	0.1917***	0.1882***	0.1903***
	(−3.0251)	(−3.1527)	(−3.0533)	(−3.0804)		(7.4891)	(7.5156)	(7.3683)	(7.4458)
Wald test (*p*-values)	0.0000	0.0000	0.0000	0.0000	*Wald* test (*p*-values)	0.0000	0.0000	0.0000	0.0000
N	128,550	128,550	128,217	128,217	*N*	128,550	128,550	128,217	128,217
$\beta_{LegCom=1}$	0.8321	4.5502	3.8949	1.4166	$\beta_{P\_Enfor\_dum=1}$	0.8775	5.4028	4.5667	1.6785
$\beta_{LegCom=0}$	1.0159	6.0854	4.6517	1.8610	$\beta_{P\_Enfor\_dum=0}$	0.8781	5.6594	4.3690	1.7606

these three countries.[25] Relatedly, we find that in our sample there are more firm-years coming from developed countries than those from developing countries.

To address these issues, we construct a subsample excluding all firms from the U.S., the U.K., and Japan. For this subsample, we re-estimate the models for different earnings-management and institutional-environment measures. Models 1–4 of Table 11 show that in this subsample we still find evidence supporting our hypotheses **H1** and **H2a**.

Next, we separate the full sample into developed countries and developing countries subsamples. We then repeat our analyses on each subsample. The results in Panels B and C show that our results are robust to economic development.

6.6. Tobit

By definition, leverage ratio is bounded between 0 and 1. Elsas and Florysiak (forthcoming) argue that ignoring the fractionality of bounded ratios generates severe estimation biases. Following Elsas and Florysiak (forthcoming), we employ a doubly-censored Tobit model as an alternative approach to address this concern. In particular, the latent dependent variable $ML^{\#}_{j,i,t}$ is generated by

$$ML^{\#}_{j,i,t} = \beta_{11}EM_{j,i,t-1} + \beta_{21}EM_{j,i,t-1} \times IE_j + \boldsymbol{\beta}_{12}\mathbf{X}_{j,i,t-1} + \boldsymbol{\beta}_{22}\mathbf{X}_{j,i,t-1} \times IE_j + \boldsymbol{\beta}_{13}\mathbf{Y}_{j,t-1} + \boldsymbol{\beta}_{23}\mathbf{Y}_{j,t-1} \times IE_j + f_i + y_t + e_{j,i,t}, \quad (6)$$

where the unobserved time-invariant firm-fixed effect is

$$f_i = \alpha_0 + \alpha_{11}\overline{EM_{j,i}} + \alpha_{21}\overline{EM_{j,i} \times IE_j} + \boldsymbol{\alpha}_{12}\overline{\mathbf{X}_{j,i}} + \boldsymbol{\alpha}_{22}\overline{\mathbf{X}_{j,i} \times IE_j} + \boldsymbol{\alpha}_{13}\overline{\mathbf{Y}_j} + \boldsymbol{\alpha}_{23}\overline{\mathbf{Y}_j \times IE_j} + \alpha_i, \quad (7)$$

where the overline indicates the time series average of a particular variable (e.g., $\overline{EM_{j,i}}$ is the time series average of $EM_{j,i,t}$) and α_i is the error term.

[25] Specifically, the U.S, the U.K., and Japan have 44,832, 13,792, and 31,145 firm-year observations, respectively. They in total account for 54% of the full sample.

The observable doubly-censored dependent variable $ML_{j,i,t}$ with two possible corner outcomes is given by

$$ML_{j,i,t} = \begin{cases} 0, & ML^{\#}_{j,i,t} \leqslant 0 \\ ML^{\#}_{j,i,t}, & 0 < ML^{\#}_{j,i,t} < 1 \\ 1, & ML^{\#}_{j,i,t} \geqslant 1 \end{cases}$$

Table 12 shows that the results by employing Tobit model are qualitatively unchanged.

6.7. Alternative country-level control variables

This subsection tests **H1** and **H2** by employing alternative country-level control variables, in particular, the growth rate of GDP (*GGDP*) and growth rate of market capitalization (*GCAP*). The results shown in Table 13 demonstrate that they are not sensitive to alternative country-level variables.

6.8. Book leverage

We also test **H1** and **H2** by employing an accounting-based leverage measure – book leverage ratio (*BL*). *BL* is defined as the book value of debt scaled by book value of assets. Table 14 shows that the magnitude and significance of our key variables of interests are similar to those regressions using market leverage ratio as dependent variable.

6.9. Alternative measures of institutional environments

In the robustness tests, we examine a number of alternative macro-level institutional-environment measures. In particular, we use macro-level variables that measure shareholder rights (*P_SH*) and accounting information quality (*P_Acct*). *P_SH* is the first principal component of anti-director index (*AntiD*) and anti-self-dealing index (*AntiSelf*); and *P_Acct* is the first principal

Table 11

Subsamples: Panel A presents the coefficient estimates of market leverage (*ML*) on earnings-management variables (*Accr*, *Smth*, *Corr*, and *P_EM*). Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) are controlled in each regression. Panels B and C present the coefficient estimates of *ML* on earnings-management variable and its interaction with institutional-environment variable (*EM* × *IE*). The institutional-environment variables include a common law dummy (*LegCom*) in Panel B and an enforcement index (*P_Enfor*) in Panel C. Firm-, industry-, and country-level variables and their interactions with institutional-environment variable (*X* × *IE* and *Y* × *IE*)) are controlled in each regression, but their coefficients are omitted for brevity. All regressions include firm- and year-fixed effects. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	Exclude the U.S., the U.K., and Japan				*Developed countries*				*Developing countries*			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Panel A												
Accr	0.1840***				0.2825***				0.1557			
	(2.8312)				(7.0334)				(1.5376)			
Smth		0.7323**				0.4630**				1.5307***		
		(2.5424)				(2.5668)				(4.0593)		
Corr			0.7212				0.4583**				1.6125**	
			(1.5534)				(2.1208)				(2.6538)	
P_EM				0.2944**				0.1704**				0.6522***
				(2.1524)				(2.6089)				(3.9477)
Tang	0.1207***	0.1207***	0.1253***	0.1253***	0.1331***	0.1333***	0.1316***	0.1318***	0.1166***	0.1169***	0.1106***	0.1109***
	(7.6119)	(7.6638)	(8.2555)	(8.2829)	(8.1517)	(8.0881)	(8.4372)	(8.4636)	(7.0074)	(7.0794)	(6.5581)	(6.5843)
Prof	−0.2289***	−0.2303***	−0.2374***	−0.2377***	−0.1882***	−0.1899***	−0.1952***	−0.1954***	−0.2682***	−0.2702***	−0.2770***	−0.2776***
	(−11.1296)	(−11.0822)	(−11.4819)	(−11.4372)	(−10.3892)	(−10.2602)	(−11.1661)	(−11.1432)	(−7.4857)	(−7.5594)	(−7.5312)	(−7.5310)
Size	0.0867***	0.0861***	0.0868***	0.0866***	0.0659***	0.0652***	0.0661***	0.0660***	0.0966***	0.0954***	0.0938***	0.0933***
	(12.7438)	(12.8564)	(12.8602)	(12.9107)	(7.3812)	(7.3509)	(6.8525)	(6.8727)	(12.8460)	(12.9383)	(12.7135)	(12.8028)
MTB	−0.0060***	−0.0060***	−0.0071***	−0.0071***	−0.0071***	−0.0072***	−0.0088***	−0.0087***	−0.0068**	−0.0068**	−0.0077**	−0.0076**
	(−4.3525)	(−4.3516)	(−4.7962)	(−4.7791)	(−9.7292)	(−9.8276)	(−11.6951)	(−11.6913)	(−2.3300)	(−2.2710)	(−2.2604)	(−2.2279)
IndMed	0.3130***	0.3130***	0.3004***	0.3003***	0.3220***	0.3227***	0.3085***	0.3087***	0.2948***	0.2947***	0.2847***	0.2844***
	(13.5459)	(13.5611)	(13.8206)	(13.7833)	(16.7786)	(16.8282)	(15.4754)	(15.4577)	(10.0146)	(10.0067)	(10.3845)	(10.3025)
GDPC	−0.1183	−0.1168	−0.1042	−0.1037	−0.0190	−0.0176	0.0015	0.0014	−0.1919**	−0.1887**	−0.1954*	−0.1933*
	(−1.3554)	(−1.3490)	(−1.2732)	(−1.2732)	(−0.4306)	(−0.3958)	(0.0327)	(0.0313)	(−2.1963)	(−2.1927)	(−2.0640)	(−2.0576)
MCAP	−0.0002***	−0.0002***	−0.0002***	−0.0002***	−0.0002***	−0.0002***	−0.0002***	−0.0002***	−0.0003**	−0.0003**	−0.0002*	−0.0002*
	(−2.9419)	(−2.9443)	(−2.9211)	(−2.9203)	(−3.7456)	(−3.7338)	(−3.5567)	(−3.5539)	(−2.1848)	(−2.1568)	(−1.9858)	(−1.9638)
GGDP	0.0014	0.0014	0.0014	0.0013	0.0007	0.0007	0.0001	0.0001	0.0017	0.0016	0.0021	0.0020
	(1.2685)	(1.2521)	(1.1569)	(1.1456)	(0.3840)	(0.3766)	(0.0543)	(0.0539)	(0.8876)	(0.8603)	(1.0514)	(1.0292)
Intercept	−0.3846	−0.3768	−0.4509	−0.4453	−0.5567***	−0.5481***	−0.6451***	−0.6402***	−0.2367	−0.2249	−0.2054	−0.1961
	(−1.1763)	(−1.1597)	(−1.4600)	(−1.4490)	(−3.1583)	(−3.0509)	(−3.5288)	(−3.4704)	(−0.7092)	(−0.6804)	(−0.5541)	(−0.5348)
Adj.R^2	0.7353	0.7353	0.7400	0.7401	0.7404	0.7402	0.7452	0.7452	0.7632	0.7634	0.7692	0.7694
N	76,394	76,394	64,963	64,963	129,383	129,383	114,771	114,771	36,780	36,780	30,699	30,699
Panel B												
Accr	0.3484***				0.3558***				0.3548***			
	(5.3237)				(10.9823)				(3.6720)			
Accr × *LegCom*	−0.3395***				−0.1440**				−0.3393*			
	(−3.0240)				(−2.2358)				(−1.9498)			
Smth		0.9550***				0.7255***				1.7585***		
		(2.7885)				(3.5506)				(3.1744)		
Smth × *LegCom*		−1.0785*				−0.5123*				−1.0324		
		(−1.9890)				(−1.7560)				(−1.1081)		
Corr			0.9270				0.3082				1.6741	
			(1.4138)				(0.9837)				(1.7434)	
Corr × *LegCom*			−0.6167				0.1120				−0.1067	
			(−0.6488)				(0.2685)				(−0.0800)	
P_EM				0.3960**				0.2053**				0.7529**
				(2.2700)				(2.6068)				(2.8686)
P_EM × *LegCom*				−0.3803				−0.0926				−0.3451
				(−1.3755)				(−0.7635)				(−0.8745)
Intercept	−0.7302***	−0.7239***	−0.7473***	−0.7410***	−0.5511***	−0.5392***	−0.6395***	−0.6316***	−0.3841	−0.3661	−0.2987	−0.2833
	(−2.9549)	(−2.9167)	(−3.2444)	(−3.2242)	(−3.1542)	(−3.0342)	(−3.6089)	(−3.5291)	(−1.3241)	(−1.2678)	(−0.9677)	(−0.9291)

Adj.R^2	0.7394	0.7393	0.7442	0.7442	0.7439	0.7437	0.7487	0.7487	0.7705	0.7707	0.7767	0.7769
N	70,200	70,200	60,073	60,073	129,383	129,383	114,771	114,771	30,586	30,586	25,809	25,809
Panel C												
Accr	0.1862**				0.0021				0.1920*			
	(2.1952)				(0.0109)				(1.8957)			
Accr × P_Enfor	0.0217				0.1311				−0.0318			
	(0.5103)				(1.4740)				(−0.5376)			
Smth		1.0190**				−0.0734				1.3821***		
		(2.4750)				(−0.1180)				(3.9366)		
Smth × P_Enfor		−0.3962*				0.2474				−0.2146		
		(−1.7246)				(0.9226)				(−0.6211)		
Corr			1.5308***				−0.1249				1.5023***	
			(2.9187)				(−0.0593)				(3.2414)	
Corr × P_Enfor			−0.7024**				0.2596				−0.8759**	
			(−2.4506)				(0.2789)				(−2.2141)	
P_EM				0.5015***				0.1536				0.6185***
				(2.9002)				(0.3483)				(4.5916)
P_EM × P_Enfor				−0.2071**				0.0068				−0.1538
				(−2.1081)				(0.0351)				(−1.0257)
Intercept	−0.8788***	−0.8680***	−0.8716***	−0.8659***	−0.5062***	−0.4977***	−0.5938***	−0.5890***	−0.6638*	−0.6456*	−0.5721	−0.5640
	(−4.1955)	(−4.1328)	(−4.1321)	(−4.1151)	(−2.9636)	(−2.8630)	(−3.3262)	(−3.2670)	(−2.0443)	(−1.9921)	(−1.5006)	(−1.4925)
Adj.R^2	0.7391	0.7391	0.7437	0.7437	0.7410	0.7407	0.7457	0.7457	0.7686	0.7688	0.7746	0.7748
N	70,200	70,200	60,073	60,073	129,383	129,383	114,771	114,771	30,586	30,586	25,809	25,809

Table 12
Tobit regressions: Panel A presents the coefficient estimates of market leverage (*ML*) on earnings-management variables (*Accr*, *Smth*, *Corr*, and *P_EM*). Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) are controlled in each regression. Panels B and C present the coefficient estimates of *ML* on earnings-management variable and its interaction with institutional-environment variable ($EM \times IE$). The institutional-environment variables include a common law dummy (*LegCom*) in Panel B and an enforcement index (*P_Enfor*) in Panel C. Firm-, industry-, and country-level variables are controlled in each regression (In Panels B and C, even number models include the interactions of all control variables and institutional-environment variable ($X \times IE$ and $Y \times IE$)), but their coefficients are omitted for brevity. All regressions include firm- and year-fixed effects. *P*-values and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	[1]	[2]	[3]	[4]
Panel A				
Accr	0.2672***			
	(10.2658)			
Smth		0.7906***		
		(7.0625)		
Corr			0.6635***	
			(4.3144)	
P_EM				0.2738***
				(6.3033)
Tang	0.1474***	0.1484***	0.1471***	0.1474***
	(31.7107)	(31.8989)	(29.1324)	(29.1974)
Prof	−0.2164***	−0.2201***	−0.2237***	−0.2240***
	(−55.0957)	(−55.8999)	(−51.6951)	(−51.7730)
Size	0.0788***	0.0779***	0.0783***	0.0781***
	(85.2332)	(84.0750)	(77.1737)	(76.8598)
MTB	−0.0107***	−0.0109***	−0.0119***	−0.0119***
	(−25.4419)	(−25.7616)	(−24.2858)	(−24.2783)
IndMed	0.3133***	0.3139***	0.3016***	0.3016***
	(62.6873)	(62.7445)	(55.8361)	(55.8180)
GDPC	−0.0975***	−0.0948***	−0.0737***	−0.0717***
	(−14.4193)	(−13.9440)	(−10.0783)	(−9.7906)
MCAP	−0.0002***	−0.0002***	−0.0002***	−0.0002***
	(−13.3207)	(−13.2042)	(−11.0773)	(−10.9570)
GGDP	0.0007***	0.0006**	0.0004	0.0003
	(2.8739)	(2.5253)	(1.3815)	(1.2480)
Intercept	−0.1763***	−0.0968***	−0.1762***	−0.1368***
	(−7.9890)	(−4.5246)	(−7.5106)	(−6.2013)
Wald test$(p-values)$	0.0000	0.0000	0.0000	0.0000
N	165,648	165,648	145,309	145,309

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Panel B								
Accr	0.3548***	0.3594***						
	(9.1106)	(9.2421)						
Accr × *LegCom*	−0.1412***	−0.1611***						
	(−2.6635)	(−3.0435)						
Smth			1.2829***	1.0763***				
			(7.6807)	(6.4508)				
Smth × *LegCom*			−1.0122***	−0.6793***				
			(−4.4566)	(−2.9881)				
Corr					1.1293***	0.6596***		
					(4.4189)	(2.5832)		
Corr × *LegCom*					−0.7089**	−0.0252		
					(−2.2149)	(−0.0787)		
P_EM							0.4853***	0.3607***
							(7.1504)	(5.3098)
P_EM × *LegCom*							−0.3756***	−0.1843**
							(−4.2487)	(−2.0790)
Intercept	−0.1775***	−0.2138***	−0.0808***	−0.1460***	−0.1966***	−0.2155***	−0.1303***	−0.1831***
	(−7.8850)	(−10.1222)	(−3.6478)	(−7.1283)	(−7.5348)	(−9.2149)	(−5.4806)	(−7.9825)
Wald test (*p*-values)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	159,468	159,468	159,468	159,468	140,425	140,425	140,425	140,425
Panel C								
Accr	0.2207***	0.2319***						
	(4.9048)	(5.1339)						
Accr × *P_Enfor*	0.0347	0.0291						
	(1.6114)	(1.3460)						
Smth			1.4996***	1.3216***				
			(7.2659)	(6.4023)				
Smth × *P_Enfor*			−0.4387***	−0.3383***				
			(−4.4299)	(−3.4132)				
Corr					1.9943***	1.8221***		
					(6.0601)	(5.5369)		
Corr × *P_Enfor*					−0.7041***	−0.6086***		
					(−4.5647)	(−3.9444)		
P_EM							0.6649***	0.6072***
							(7.5186)	(6.8600)

Table 12 (*continued*)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
P_EM × *P_Enfor*							−0.2171***	−0.1856***
							(−5.2032)	(−4.4422)
Intercept	−0.1509***	−0.2007***	−0.0992***	−0.0643*	−0.1737***	−0.1481***	−0.1322***	−0.0820**
	(−6.7009)	(−5.7902)	(−3.4654)	(−1.9195)	(−4.8724)	(−3.8919)	(−5.3022)	(−2.1762)
Wald test (*p*-values)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	159,468	159,468	159,468	159,468	140,425	140,425	140,425	140,425

Table 13

Alternative country-level control variables: Panel A presents the coefficient estimates of market leverage (*ML*) on earnings-management variables (*Accr*, *Smth*, *Corr*, and *P_EM*). Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GCAP*, and *GGDP*) are controlled in each regression. Panels B and C present the coefficient estimates of *ML* on earnings-management variable and its interaction with institutional-environment variable (*EM* × *IE*). The institutional-environment variables include a common law dummy (*LegCom*) in Panel B and an enforcement index (*P_Enfor*) in Panel C. Firm-, industry-, and country-level variables are controlled in each regression (In Panels B and C, models labeled by even numbers include the interactions of all control variables and institutional-environment variable (*X* × *IE* and *Y* × *IE*)), but their coefficients are omitted for brevity. All regressions include firm- and year-fixed effects. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	[1]	[2]	[3]	[4]				
Panel A								
Accr	0.2410***							
	(5.6208)							
Smth		0.7169***						
		(3.9963)						
Corr			0.6352***					
			(3.4704)					
P_EM				0.2599***				
				(4.0956)				
Tang	0.1368***	0.1371***	0.1341***	0.1344***				
	(8.0988)	(8.0595)	(8.6604)	(8.6827)				
Prof	−0.1956***	−0.1975***	−0.2035***	−0.2039***				
	(−11.0953)	(−10.9983)	(−11.5659)	(−11.5525)				
Size	0.0695***	0.0688***	0.0699***	0.0697***				
	(8.8237)	(8.7919)	(8.1256)	(8.1581)				
MTB	−0.0075***	−0.0075***	−0.0088***	−0.0088***				
	(−11.7788)	(−11.8014)	(−11.3653)	(−11.3243)				
IndMed	0.3180***	0.3185***	0.3063***	0.3064***				
	(15.3094)	(15.4337)	(15.5857)	(15.6092)				
GCAP	−0.0002*	−0.0002*	−0.0001	−0.0001				
	(−1.9597)	(−1.9359)	(−1.3674)	(−1.3613)				
GGDP	−0.0000	−0.0000	−0.0001	−0.0001				
	(−0.0312)	(−0.0341)	(−0.0812)	(−0.0858)				
Intercept	−0.6242***	−0.6088***	−0.6330***	−0.6262***				
	(−6.0981)	(−6.0103)	(−5.6864)	(−5.6475)				
Adj.R^2	0.7458	0.7457	0.7508	0.7508				
N	163,985	163,985	143,522	143,522				
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Panel B								
Accr	0.3421***	0.3346***						
	(9.5786)	(10.0941)						
Accr × *LegCom*	−0.1576**	−0.1617**						
	(−2.3369)	(−2.4017)						
Smth			1.1708***	1.0939***				
			(5.0106)	(5.0709)				
Smth × *LegCom*			−0.9896***	−0.9006***				
			(−3.2176)	(−2.9728)				
Corr					1.1168**	0.8464**		
					(2.6407)	(2.0475)		
Corr × *LegCom*					−0.8052	−0.4654		
					(−1.5982)	(−0.8801)		
P_EM							0.4685***	0.4069***
							(3.8710)	(3.4397)
P_EM × *LegCom*							−0.3914**	−0.3120*
							(−2.5827)	(−1.9607)
Intercept	−0.6241***	−0.6807***	−0.6097***	−0.6658***	−0.6326***	−0.6937***	−0.6259***	−0.6871***
	(−6.0091)	(−11.0710)	(−5.8199)	(−10.6694)	(−5.6360)	(−10.4966)	(−5.5258)	(−10.2925)
Adj.R^2	0.7487	0.7500	0.7486	0.7499	0.7535	0.7548	0.7535	0.7548
N	157,791	157,791	157,791	157,791	138,632	138,632	138,632	138,632
Panel C								
Accr	0.1956**	0.1867**						
	(2.1984)	(2.2277)						

(*continued on next page*)

Table 13 (*continued*)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Accr × *P_Enfor*	0.0361	0.0402						
	(0.8649)	(1.0270)						
Smth			1.3719***	1.2162***				
			(2.8788)	(2.7789)				
Smth × *P_Enfor*			−0.4233*	−0.3515				
			(−1.8055)	(−1.6301)				
Corr					1.9130***	1.6845***		
					(3.2396)	(3.4473)		
Corr × *P_Enfor*					−0.6969**	−0.5931**		
					(−2.5512)	(−2.5316)		
P_EM							0.6313***	0.5666***
							(3.2227)	(3.2907)
P_EM × *P_Enfor*							−0.2141**	−0.1852**
							(−2.2832)	(−2.2197)
Intercept	−0.6248***	−0.6166***	−0.6096***	−0.6021***	−0.6334***	−0.6238***	−0.6263***	−0.6173***
	(−5.9778)	(−7.0598)	(−5.8609)	(−6.9201)	(−5.6113)	(−6.3979)	(−5.5256)	(−6.2936)
Adj.R^2	0.7487	0.7491	0.7486	0.7490	0.7535	0.7539	0.7535	0.7540
N	157,791	157,791	157,791	157,791	138,632	138,632	138,632	138,632

Table 14
Book leverage: Panel A presents the coefficient estimates of book leverage (*BL*) on earnings-management variables (*Accr*, *Smth*, *Corr*, and *P_EM*). Firm-, industry-, and country-level variables (*Tang, Prof, Size, MTB, IndMed, GDPC, MCAP*, and *GGDP*) are controlled in each regression. Panels B and C present the coefficient estimates of *BL* on earnings-management variable and its interaction with institutional-environment variable (*EM* × *IE*). The institutional-environment variables include a common law dummy (*LegCom*) in Panel B and an enforcement index (*P_Enfor*) in Panel C. Firm-, industry-, and country-level variables are controlled in each regression (In Panels B and C, models labeled by even numbers include the interactions of all control variables and institutional-environment variable (*X* × *IE* and *Y* × *IE*)), but their coefficients are omitted for brevity. All regressions include firm- and year-fixed effects. Adjusted R^2 and number of observations are reported. Standard errors are robust to clustering within each country. T-statistics are given in parentheses. ***, ** or * next to coefficients indicate that coefficients are significantly different from zero at the 1%, 5%, or 10% levels, respectively.

	[1]	[2]	[3]	[4]
Panel A				
Accr	0.1692***			
	(5.3464)			
Smth		0.4193***		
		(3.8577)		
Corr			0.3572**	
			(2.6882)	
P_EM				0.1584***
				(3.6077)
Tang	0.1093***	0.1096***	0.1073***	0.1076***
	(14.6830)	(14.7423)	(15.7172)	(15.7692)
Prof	−0.1503***	−0.1516***	−0.1499***	−0.1501***
	(−10.2700)	(−10.1470)	(−10.4442)	(−10.4362)
Size	0.0433***	0.0427***	0.0425***	0.0424***
	(6.4217)	(6.4265)	(6.0872)	(6.0997)
MTB	−0.0006	−0.0006	−0.0009	−0.0009
	(−0.5643)	(−0.5990)	(−0.9051)	(−0.8946)
IndMed	0.3427***	0.3426***	0.3299***	0.3297***
	(14.1253)	(14.1230)	(15.1906)	(15.1799)
GDPC	0.0232	0.0244	0.0297	0.0298
	(0.9140)	(0.9668)	(1.1344)	(1.1432)
MCAP	−0.0000	−0.0000	−0.0000	−0.0000
	(−1.2121)	(−1.2134)	(−0.9422)	(−0.9370)
GGDP	−0.0002	−0.0002	−0.0004	−0.0004
	(−0.3325)	(−0.3591)	(−0.8722)	(−0.8860)
Intercept	−0.4630***	−0.4574***	−0.4846*******	−0.4810***
	(−4.3115)	(−4.2962)	(−4.0134)	(−4.0019)
Adj.R^2	0.7409	0.7408	0.7461	0.7461
N	166,163	166,163	145,470	145,470

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Panel B								
Accr	0.2424***	0.2453***						
	(6.6615)	(7.1031)						
Accr × *LegCom*	−0.1276***	−0.1417***						
	(−3.1344)	(−3.5689)						
Smth			0.8041***	0.6567***				
			(5.1993)	(5.2801)				
Smth × *LegCom*			−0.7127***	−0.4832***				
			(−3.7900)	(−3.0210)				
Corr					0.9718***	0.6650**		
					(2.8997)	(2.2268)		

Table 14 (*continued*)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Corr × *LegCom*					−0.9450***	−0.5037		
					(−2.7694)	(−1.5840)		
P_EM							0.3532***	0.2713***
							(4.1874)	(3.8289)
P_EM × *LegCom*							−0.3347***	−0.2119**
							(−3.7232)	(−2.6013)
Intercept	−0.5248***	−0.5094***	−0.5140***	−0.5003***	−0.5324***	−0.5174***	−0.5258***	−0.5117***
	(−4.9501)	(−5.2797)	(−4.8665)	(−5.1867)	(−4.3056)	(−4.6751)	(−4.2439)	(−4.6245)
Adj.R^2	0.7396	0.7408	0.7395	0.7407	0.7448	0.7461	0.7449	0.7462
N	159,969	159,969	159,969	159,969	140,580	140,580	140,580	140,580
Panel C								
Accr	0.1780***	0.1744***						
	(3.0842)	(3.2440)						
Accr × *P_Enfor*	−0.0031	−0.0015						
	(−0.1143)	(−0.0575)						
Smth			0.9293***	0.8137***				
			(3.2220)	(3.4219)				
Smth × *P_Enfor*			−0.2944*	−0.2249*				
			(−1.9758)	(−1.8962)				
Corr					1.6983***	1.5826***		
					(3.7704)	(4.0280)		
Corr × *P_Enfor*					−0.7080***	−0.6357***		
					(−3.2421)	(−3.4074)		
P_EM							0.4811***	0.4435***
							(3.5323)	(3.7886)
P_EM × *P_Enfor*							−0.1773**	−0.1544**
							(−2.6149)	(−2.7231)
Intercept	−0.5252***	−0.6474***	−0.5183***	−0.6407***	−0.5380***	−0.6474***	−0.5340***	−0.6433***
	(−4.9472)	(−6.5731)	(−4.8852)	(−6.5305)	(−4.2702)	(−5.6304)	(−4.2597)	(−5.6187)
Adj.R^2	0.7396	0.7403	0.7395	0.7402	0.7449	0.7454	0.7449	0.7454
N	159,969	159,969	159,969	159,969	140,580	140,580	140,580	140,580

component of accounting standards (*AccStd90*) and auditing practices (*Audit*).

In addition, as alternatives to institutional environments, we also use the Worldwide Governance Indicators (*WGI*) by Kaufmann et al. (2009). They define *WGI* as a series of indicators that measure "the traditions and institutions by which authority in a country is exercised. This includes six broad aspects of governance: accountability, political instability, government effectiveness, regulatory burden, rule of law, and control of corruption" (p.5).[26] We compute the first principal component of these six WGIs and denote this variable by *P_K09*. In addition, Kaufmann (2004) develops six ethics indices that cover various dimensions of corporate and public sector ethics and governance. These indices include a corporate illegal corruption component, corporate legal corruption component, corporate ethics index, public sector ethics index, judicial/legal effectiveness index, and corporate governance index. We compute the first principal component of these six ethics indices and use it as a single ethics index. This variable is denoted by *P_K04*.

The results (unreported) show that coefficient estimates of the interactions between earnings management and *P_SH* or *P_Acct* are negatively significant. In summary, we obtain qualitatively consistent results across difference earnings management by using *P_SH* or *P_Acct* as institutional setting measures. It suggests that strong institutional environments (in particular, better shareholder protection and accounting information quality) could protect investors and reduce the earnings management - financial leverage sensitivity.

Further, we examine governance index (*P_K09*) and ethics index (*P_K04*) as alternative institutional-environment variables. The results are largely similar to prior results and hence consistent with our hypotheses. In particular, the earnings-management variables are positively significant, and their interactions with *P_K09* or *P_K04* are negatively significant. The results confirm our findings presented in the previous section. They suggest that financial leverage is less sensitive to earnings management in the countries with a high governance indicator and ethic index.

In addition, we estimate our model with each sub-index of *P_Enfor*, *P_SH*, *P_Acct*, *P_K09*, and *P_K04*. The results are qualitatively consistent with our hypotheses and not reported for brevity.[27]

7. Conclusion

In this paper, we shed new light on firms' capital-structure choices by employing a comprehensive sample of 25,777 firms across 37 countries over two decades. We focus on the relation between earnings and financial leverage and the role of institutional environments in reshaping this relation. Two novel results emerge from this study.

First, we find robust evidence that firms engaging in higher earnings management activities on average have higher financial leverage. Combined with the notion that a firm's earnings management reflects the agency conflicts between insider managers and outside investors, these results support the disciplining role of debt in reducing the agency cost of free flow.

Second, we document that the positive relation between earnings management and financial leverage is much less pronounced in countries with better institutional environments. This finding supports the notion that investors in the countries with strong institutional environments are more reliant on "free" macro-level institutional settings than using debt in mitigating agency conflicts.

[26] The six *WGI* cover 212 countries for the years of 1996, 1998, 2000, and annually for 2002–2009. We obtain the cross-sectional *WGIs* by taking the time-series mean of each WGI.

[27] The results of Section 6.9 are available upon request.

We conduct several robustness checks. Our results are robust to different earnings-management and leverage measures, different estimation techniques, different subsamples, and different institutional-environment variables.

There are policy implications. For firms operating in countries with strong (weak) institutional environments, managers' earnings management activities are tolerated less (more) by investors. The adverse effect of earnings management on leverage seems to be at least partially offset by institutional environments. Consequently, institutional environments should be improved to maintain stronger investor protection and higher accounting credibility in firms.

Appendix A. Variable definitions

A.1. Firm- and industry-level variables

A.1.1. Leverage measure

- Market leverage (*ML*): Book value of debt scaled by market value of assets. Market value of assets is defined as the sum of book value of debt, market value of equity and book value of preferred stock, (*Source*: Worldscope)
- Book Leverage (*BL*): Book value of debt scaled by book value of assets, (*Source*: Worldscope).

A.1.2. Earnings-management measures

- Earnings discretion – magnitude of accruals (*Accr*): $Accr_{j,i,t} = 1/5 \sum_{t-4}^{t} |Accruals_{j,i,t} / CF_{j,i,t}|$, $Accruals = (\Delta Assets - \Delta Cash\ and\ equivalent) - (\Delta Current\ liability - \Delta Short\ term\ debt - \Delta Income\ taxes\ payable) - Depreciation\ and\ amortization\ expense$, Cash flow from operations (CF) = $Operating\ income - Accruals$. For a firm, if the changes of short-term debt and taxes payable are not available, these variables are set as zero. All accounting variables are scaled by one year lag of total assets (A minimum of three years is required), (*Source*: Worldscope)
- Earnings smoothing – standard deviation (*Smth*): $Smth = -\sigma(Operating\ income)/\sigma(CF)$ over the last five years, (A minimum of three years is required), (*Source*: Worldscope)
- Earnings smoothing – correlation (*Corr*): $Corr = -\rho(\Delta Accr, \Delta CF)$ over the last five years, (A minimum of three years is required), (*Source*: Worldscope)
- Earnings management – (*P_EM*): The first principal component of *Accr*, *Smth*, and *Corr*, (*Source*: Worldscope).

A.1.3. Firm- and industry-level variables

- Tangibility (*Tang*): Ratio of net property, plant and equipment divided to book value of assets, (*Source*: Worldscope)
- Profitability (*Prof*): Ratio of earnings before interest, taxes, depreciation and amortization to book value assets, (*Source*: Worldscope)
- Size (*Size*): Natural log of book value of assets which deflated to 2005 U.S. dollars by using U.S. GDP deflator, (*Source*: Worldscope)
- Growth opportunity (*MTB*): Ratio of market value of assets to book value of assets, (*Source*: Worldscope)
- Industry-median leverage ratio (*IndMed*): The median leverage ratio of an industry to which firms belong. Industry is classified based on Industry Classification Benchmark, (*Source*: Worldscope)
- Closely held shares (*Close*): Dummy variable equals to one if the ratio of number of shares held by insiders to common shares outstanding is above country median in a given year, and zero otherwise. Insiders holdings include shares held by cross holdings, corporations (incl. real estate companies), holding company, government, employees, and individuals/insiders, (*Source*: Worldscope)
- Top 5 ownership (*Top5*): Dummy variable equals to one if the ownership by top 5 institutional investors in percentage of market capitalization is above country median in a given year, and zero otherwise, (*Source*: FactSet)
- Blockholder ownership (*Blockholder_1%*): Dummy variable equals to one if the ownership by institutional blockholders (>=1%) in percentage of market capitalization is above country median in a given year, and zero otherwise, (*Source*: FactSet)
- Blockholder ownership (*Blockholder_5%*): Dummy variable equals to one if the ownership by institutional blockholders (>=5%) in percentage of market capitalization is above country median in a given year, and zero otherwise, (*Source*: FactSet).

A.2. Country-level variables

- GDP per capita (*GDPC*): Natural log of GDP per capita measured in U.S. dollar, (*Source*: World Development Indicator)
- GDP growth (*GGDP*): Annual GDP growth rate, (*Source*: World Development Indicator)
- Stock market capitalization to GDP (*MCAP*): Stock market capitalization scaled by GDP, (*Source*: World Development Indicator)
- Stock market capitalization growth (*GCAP*): Stock market capitalization growth rate, (*Source*: World Development Indicator).

A.3. Institutional-environment variables

- English common law (*LegCom*): Dummy variable equals to one if a country adopts common law system, zero otherwise, (*Source*: La Porta et al., 1998)
- Enforcement (*P_Enfor*): The first principal component of *EffJud*, *RulLaw*, *Corruption*, *RisExp*, and *Repudiation*.
  - Efficiency of judicial system (*EffJud*): Measures the efficiency and integrity of the countries' legal environment. The index is scaled from 0 (lowest efficiency) to 10 (highest efficiency), (*Source*: La Porta et al., 1998)
  - Rule of law (*RulLaw*): Measures the law and order tradition in the country. The index is scaled from 0 (lowest tradition) to 10 (highest tradition), (*Source*: La Porta et al., 1998)
  - Corruption (*Corruption*): Measures the corruption level of the government in the country. The index is scaled from 0 (lowest level of corruption) to 10 (highest level of corruption), (*Source*: La Porta et al., 1998)
  - Risk of expropriation (*RisExp*): Measures the risk of "outright confiscation" or "forced nationalization". The index is scaled from 0 (highest risk) to 10 (lowest risk), (*Source*: La Porta et al., 1998)
  - Repudiation of contracts by government (*Repudiation*): Measures the risk of a modification in a contract taking the form of a repudiation, postponement, or scaling down due to budget cutbacks, indigenization pressure, a change in government, or a change in government economic and social priorities. The index is scaled from 0 (highest risk) to 10 (lowest risk), (*Source*: La Porta et al., 1998)
- Shareholder protection (*P_SH*): The first principal component of *AntiD* and *AntiSelf*.
  - Anti-director rights index (*AntiD*): An aggregated shareholder right index which including six dimensions. The index is formed by adding 1 when the country allows proxy the vote by mail; shareholders are not required

to deposit their shares prior to the general shareholders' meeting; cumulative voting or proportional representation of minorities on the board of directors is allowed; an oppressed minorities mechanism is in place; the country requires the shareholder to hold at least 10 percent of share capital to call for an extraordinary shareholders' meeting; or shareholders have preemptive right that can be waived only by a shareholders' vote. This index is scaled from 0 (weakest shareholder protection) to 6 (strongest shareholder protection), (*Source*: La Porta et al., 1998)

– Anti-self-dealing index (*AntiSelf*): Quality of shareholder right enforcement. It computed as the average of ex-ante and ex-post private control of self-dealing. A Higher value indicates a better quality of shareholder right enforcement of the country, (*Source*: Djankov et al., 2008)

- Accounting information quality (*P_Acct*): The first principal component of *AccStd90* and *Audit*.
  - Accounting standards (*AccStd90*): Average inclusion or omission of the 90 accounting and non-accounting items by examining 1990 annual reports of the companies. A higher value indicates a more transparency information environment of the country. This items fall into seven categories (general information, income statements, balance sheets, fund of flow statements, accounting standards, stock data, and special items), (*Source*: La Porta et al., 1998)
  - Auditing practices (*Audit*): The percentage of firms in the country audited by the big 5 accounting firms. It equals to 1, 2, 3 or 4 if the percentage ranges between [0, 25%], (25%, 50%], (50%, 75%] and (75%, 100%], (*Source*: Bushman et al., 2004)
- Governance indicator (*P_K09*): The first principal component of six variables that measure various dimensions of governance. These variables include voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. A higher value indicates a better institutional environment of the country, (*Source*: Kaufmann et al., 2009)
- Ethics index (*P_K04*): The first principal component of six ethics and governance indices that measure various dimensions of corporate and public sector ethics and governance. These indices include corporate illegal corruption component, corporate legal corruption component, corporate ethics index, public sector ethics index, judicial/legal effectiveness index, and corporate governance index. A higher value indicates a better institutional environment of the country, (*Source*: Kaufmann, 2004).

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