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What determines debt structure in emerging markets: Transaction costs or public monitoring?

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Abstract

We examine the predilection for private bonds over bank financing (debt structure) for emerging markets within the frameworks of both transaction cost economics and a transparency explanation, emphasizing the distinction between public monitoring (bonds) and private monitoring (banks), as well as considering the influence of national culture on institutions. Employing several tests, including structural equation modeling, we find, among many results that in emerging markets bonds are preferred over bank loans when there is less corporate opacity and fewer foreign access restrictions, as well as in environment of greater political instability, transaction cost, and limits to legal protection. Bonds are also favored over banks in cultural environments of greater uncertainty avoidance, masculinity, long-term orientation, and indulgence and less individualism. Overall, we attribute our results to culture and institutional quality together influencing debt structure, particularly by impacting attitudes toward public monitoring. Our results will be of great interest to researchers interested in the legal, social, and cultural environments of emerging markets.

JEL Classifications: F39, G20, G21

Keywords: Emerging markets; Public monitoring, Transaction costs, Corporate bonds, Relationship financing, Debt structure; National culture

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1. Introduction

Recent research has investigated the determinants of bank versus market financing (financial structure). For instance, Aggarwal and Goodell (2009a), Aggarwal and Goodell (2009b), Ergungor (2004), and Kwok and Tadesse (2006), among others, look at governance and culture as determinants of financial structure. However, less research has been carried out on the determinants of bond versus bank financing (debt structure), especially in the context of emerging markets.

The literature on stock market financing versus bank financing is only partially applicable to understanding why some societies prefer to obtain loans through relationship financing rather than bonds. For instance, examining stock market financing versus bank financing ignores the impact of leverage on financing choices, whereas focusing only on the debt component avoids this problem. Further, most research on bank versus stock market financing has focused on the transaction costs of market financing (Williamson, 1998) and the concomitant costs of resolving the asymmetric information of contracts (Hart, 2001).

However, bond versus bank financing, while also influenced by transactions costs, reveals the important and intriguing issue of the public monitoring of bonds through ratings agencies versus the private monitoring of banks. The issue of transparency is therefore additionally important to the issue of bonds versus banks. Past research has also found that, under financial distress, firms prefer bank financing to bond financing (Chemmanur and Fulghieri, 1994). It is reasonable to consider that firms' attitude toward public versus private monitoring is influenced by their respective financial health.

However, past research on debt structure has not focused on emerging markets while comprehensively controlling for institutional quality and national culture. In this paper, we draw upon the recent comprehensive dimensioning of emerging market institutional quality outlined by Karolyi (2015). We also investigate national culture as a determinant, employing the complete set of six cultural dimensions of Hofstede, Hofstede and Minkov (2010). We consider that national culture and institutions are related,

with institutional quality and nature is likely shaped by culture. We reflect on this concern in our paper by including the results of structural equation modeling.

For our sample period of 2000–2013 for 21 emerging-market countries, we examine the predilection for private bonds over bank financing (debt structure) within the frameworks of both transaction cost economics and a transparency explanation, emphasizing the distinction between public monitoring (bonds) and private monitoring (banks) while simultaneously considering the influence of culture on the institutions. Employing several tests, and including structural-equation modeling, we find, among many results, that in emerging markets, bonds are preferred over banks when there are less corporate opacity and fewer foreign access restrictions, as well as in environments of greater political instability, transactions costs, and limits to legal protection. Bonds are also favored over banks in cultural environments of greater uncertainty avoidance, masculinity, long-term orientation, and indulgence and less individualism. Overall we interpret our results as suggestive of a preference for bonds over banks, and is impeded by a predilection for more individualistic and less uncertainty-avoiding cultures to self-monitor, but encouraged by gaps in governance that lower the consequences of public monitoring. Our results will be of great interest to researchers interested in the legal, social, and culture environments of emerging markets.

2. Background

2.1 Determinants of banks versus bonds

As observed by Tanaka (2005), a fundamental distinction between bond financing and bank lending is that banks act as private monitors and keep the assessments of borrowers private. This is in contrast to ratings agencies acting as public monitors. Therefore, firms not wanting unfavorable aspects to be public will prefer bank financing over bond financing. Contrarily, with bonds, private rating agencies act as public monitors. Unfavorable aspects can include the danger of financial distress, so it is reasonable to consider that firms in financial distress will prefer bank financing to bond financing. Chemmanur and Fulghieri (1994) affirm that banks are favored by firms in financial distress, but from a different angle. The authors argue that banks have an incentive to make correct renegotiation decisions to enhance reputational capital.

In what appears to be a contrasting point of view, De Fiore and Uhlig (2005) theoretically model that banks are more favored over bonds in Europe in contrast to the United States because of lower levels of information about creditworthiness. A monitoring explanation of debt structure could assume the opposite *i.e.* in environments of lower credible information, it could be safer for firms to expose themselves to public monitoring. However, it could be argued that banks are not just a private monitor but a better monitor, largely because they have a larger information set than just public information (Diamond, 1984; Fama 1985). Diamond (1991) finds the choice between bank loans and private debt to be driven by both comfort with being monitored and firm reputation. Yosha (1995) finds that firms with more sensitive information prefer bank debt. Krishnaswami and Subramaniam (1999) find that banks are more valuable as private monitors when information asymmetry is severe. They proxy information asymmetry between a firm and lenders as the residual volatility in the firm's stock returns. Denis and Mihov (2003), however, measure information asymmetry by the ratio of research and development expenses to sales and find no significance for this variable.

Boot and Thakor (1997) assert that the role and usage of banks versus bonds – or any sort of market financing – have much to do with primitive and initial endowments that have shaped attitudes and institutional evolution. The authors note uncertainties not just with regard to assessing firm value but also with regard to the moral hazard of firms that influence choices to the detriment of creditors. Much also has to do with how much stake in the game banks are allowed to have.

To fully explore all aspects of why in particular societies, banks or bonds are more favored could potentially involve examining a multitude of factors, including individual country laws on banking, the nature of the businesses of firms, and so forth. However, in this study of emerging market countries, using a new comprehensive set of institutional characteristics for emerging markets and the complete set of national cultural dimensions of Hofstede et al. (2010), we present empirical results that explain a large part of the country-level variance in bank versus bond financing. We find overall institutional and cultural qualities dominate with regard to this choice of financial structure for emerging markets. Overall, we interpret our results as suggesting that a preference for bonds over banks is impeded by a predilection for

more individualistic and less uncertainty-avoiding cultures to self-monitor, but are encouraged by gaps in governance that lower the consequences of public monitoring.

2.2 Institutions and debt structure

To capture the institutional quality of each emerging market, we employ six emerging market dimensions of Karolyi (2015): 1) market capacity constraints (POOR_CAPACITY), 2) operational inefficiencies (POOR_OPERATION), 3) foreign accessibility restrictions (FOREIGN_RESTRICTIONS), 4) corporate opacity (CORPORATE_OPACITY), 5) limits on legal protection (POOR_LEGAL), and 6) political instability (POLITICAL_UNSTABLE).

Market capacity constraints concern the scope and breadth of capital markets, including the capitalization of equity markets, the size of bond markets, and the number and turnover of listed companies on the stock market. Operational inefficiencies regard the costs of transactions, such as the broker commission, fees paid to exchanges, investment taxes, stringent trading rules, and issues of liquidity. Foreign accessibility restrictions involve the liberalization of capital flow and their regulation, both de jure and de facto. These include de jure registration requirements, ownership restrictions, and foreign capital gains tax, among others. De facto measures include the investment rations of the Standard & Poor's (S&P) Emerging Markets database, size of the ADR market (Doidge, Karolyi and Stulz, 2009), total external assets and liabilities to the gross domestic product (GDP), and the ratios of the external portfolio and direct equity to the GDP (Lane and Milesi-Ferretti, 2001).

Corporate opacity regards standards for corporate reporting and corporate governance, including such measures as the transparency scores of Bushman, Piotroski and Smith (2004), the S&P transparency scores, and the Center for International Financial Analysis and Research accounting standards among others. Limits on legal protection regard limits on the legal protections afforded to investors. These include the measures of La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998), such as the judicial efficiency, rule of law, and creditor rights indices; the formalism index of Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003); the anti–self-dealing index of Djankov, La Porta, Lopez-de-Silvanes and Shleifer (2008); as well as measures from the World Bank's Doing Business series. Political instability concerns measures

country-level political governance *i.e.* World Bank governance indicators, Heritage Foundation's Index of Economic Freedom, and Corruption Perceptions Index of Transparency International. This variable also incorporates measures of democratic character of the respective polity. These measures include the fractionalization of political power from the World Bank database of political institutions, the proportionality index of Pagano and Volpin (2006), the Polity IV index, and the political constraints index of Henisz (2000).

The components mentioned above for each emerging market dimension are but a subset of the complete set of factors included by Karolyi (2015), whose factors also include proprietary non-public measures. Karolyi (2015) aggregates the separate components for each dimension of emerging market inefficiency into a single country-level score with principal component analysis approach. While the author does not publish the final scores for these dimensions, for this paper we follow the published rankings.[1] We rank the countries in our sample according to their order as presented by Karolyi (2015). With 21 countries in our sample, we derive scores for each dimension as 22 minus the ranking. A higher score is thus representative of a more inefficient country-level situation for the respective dimension. Overall, we feel that using Karolyi (2015) dimensions affords systematic and complete control of the institutional environment of the emerging markets in our sample.

To assess the impact of culture on debt structure, we include as independent variables the six cultural dimensions of Hofstede et al. (2010): uncertainty avoidance (UAI), individualism versus collectivism (IDV), power distance (PDI), masculinity or gender differentiation (MAS), indulgence versus restraint (IVR), and long-term orientation (LTOWVS).[2] We note that the national culture dimensions of Hofstede (1980) and Hofstede et al. (2010) have been implicitly endorsed by their inclusion in hundreds of research studies (Kirkman, Lowe and Gibson, 2006). Culture has been shown to impact transaction costs

[1] We conduct additional empirical analysis by using the approximate PCA scores from *radio-graphs* published on the author's webpage (http://www.emergingmarketsenigma.com/data/). Our results are qualitatively similar, and statistically consistent with published rankings and available from the authors upon request.
[2] To improve sample sizes, Hofstede et al. (2010) employ the World Values Survey to assist in forming their estimates of this last cultural dimension.

(Aggarwal and Goodell, 2009a; Kwok and Tadesse, 2006). Regarding monitoring, Gray (1988), and Aggarwal and Goodell (2015) evidence an association of culture with transparency.

2.2.1 Institutions, transactions costs, and debt structure

Related to the public versus private monitoring dichotomy of bonds versus banks, it has been recognized, at least since Akerlof (1970), that asymmetric information creates a cost to market transactions in the aggregate. Grossman and Stiglitz (1980) echo this notion, noting that the costs of information collection are a key component of market transactions. Therefore, the nature of monitoring has important implications for financial systems. According to North (1990), the costliness of the information needed for the measurement and enforcement of exchanges creates transaction costs. As noted by Williamson (1988) and many others (e.g., Hart, 2001), the primary transactions costs of market exchanges stem from asymmetric information and the uncertainties of contracts.

Transaction cost economics suggest that the overall cost of market exchange have a significant impact on respective financial systems (Williamson, 1975). This point has been heavily emphasized in articles examining the predilection for stock market financing over bank financing. For example, Aggarwal and Goodell (2009a), Ergungor (2004), and Kwok and Tadesse (2006) suggests either explicitly or implicitly that the choice of stock market financing over bank financing is influenced strongly by differences in transaction costs across nations, with these transaction costs primarily being costs associated with market contracts that are not present in relationship financing. Ergungor (2004), in particular, finds markets are favored over banks in environments of a common law or English legal origin. This echoes the legal origin theory of La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997), which suggests greater investor protection under common law than civil law. When there is greater legal protection for investors, there are lower transaction costs of resolving the asymmetries of information inherent in market contracts. This is because, in environments of better legal protection, there are lesser ultimate consequences of violations of social trust. In this study, we include Karolyi's (2015) six dimensions of institutional quality.

Two of these dimensions, the degree of limits on legal protection and the degree of political instability, reflect cross-national differences in the ability of institutions to protect investors. Limits on legal protection directly lower investor protection. Instability of the polity also undermines legal guarantees. So, from a transaction cost point of view, we expect limits to legal protection and political instability to be significantly negatively associated with debt structure. Similarly, other institutional variables associated with increased transactions costs will, from a transactional cost perspective are expected to have a negative association with debt structure.

2.2.2 Institutions, monitoring, and debt structure

In the previous section, we briefly introduce the role of institutional quality in shaping transaction costs, which, in turn, shapes debt structure. However, in this section we also consider the role of institutions in shaping debt structure by impacting the costs and benefits of public versus private monitoring. We consider that, particularly in countries with lower levels of institutional development, that limits to legal protection and instability of the polity can contribute to an overall institutional environment in which firms may be more comfortable with being publicly monitored. In environments of weak governance there are lesser consequences to unfavorable public monitoring.

Of course, the notion that weak investor protection and weak political institutions could, under some circumstances, encourage private bond market development as an alternative to banks, runs counter to the widespread belief that institutional development and capital market development go hand in hand. Many papers (e.g., Acemoglu and Johnson, 2005; Bebchuk and Weisbach, 2010; Beck and Levine, 2005; Claessens and Laeven, 2003) find evidence or posit a positive association of institutional development and capital market development. However, whether the private bond markets of emerging market countries differ from those of developed countries should at least be considered. For instance, Laeven (2014) notes that, while the private bond markets of moderately wealthier countries have grown considerably over recent decades, this has not necessarily been true for the private bond markets of lower-income countries.

Other expected relations between institutional quality and comfort with private monitoring include expecting a negative significance of bonds over banks with greater corporate opacity. We expect corporate opacity to be consistent with an environment antagonistic to monitoring.

2.3 National culture and debt structure

National culture is increasingly investigated as a possible determinant of financial outcomes (Aggarwal and Goodell, 2014). In this section, we briefly outline two channels that can impact debt structure. Culture influences behavior through either 1) directly influencing transactions costs by influencing confidence, toleration of ambiguity, or other qualities or 2) directly influencing a predilection for transparency and comfort with public monitoring.

2.3.1 National culture, transaction costs, and debt structure

Aggarwal and Goodell (2009a) and Kwok and Tadesse (2006) emphasize the role of national culture in determining nations' predilection for stock market financing versus bank financing. Their arguments are along the lines of the transaction cost being used to resolve the asymmetric information of contracts, thereby depressing market financing in favor of bank financing. Of particular interest is uncertainty avoidance. Empirical results for studies investigating financing choices find nations higher in uncertainty avoidance favor bank financing over stock markets. Other cultural variables too play a potential role with regard to transaction costs. For instance, individualism has been associated with enhanced confidence (Chui, Titman and Wei, 2010). By extension, confidence lowers transaction costs by reducing the impetus for costly information gathering. In a similar vein, masculinity has also been linked to enhanced assertiveness (Hofstede et al., 2010). Alternatively, power distance and other forms of social fractionalization have been linked to greater transaction costs. We consider that a long-term orientation engenders trust and thus lowers transaction costs (Hagen and Choe, 1998). We suggest indulgence versus restraint could also reduce transaction costs by establishing a looser and more relaxed approach to decision making.

2.3.2 National culture, monitoring, and debt structure

In the previous section, we briefly introduced the role of national culture in shaping transaction costs, which in turn shapes debt structure. In this section, we also consider the role of national culture in shaping debt structure by impacting the costs and benefits of public versus private monitoring. Culture emerges from an economically and socially optimizing process that aggregates behavioral traits. The traits that prove to be economically and socially optimizing survive and then become the basis for a society's culture. As an extension, much prior literature has documented that culture affects economic actions and financial decision making (Guiso, Sapienza and Zingales, 2006).

Highly individualistic cultures focus on the self, not others. With regard to individualism, we note literature associating individualism with a need to sustain self-construal and more self-monitoring (Gudykunst, Gao, Nishida, Bond, Leung, Wang and Barraclough, 1989; Trubisky, Ting-Toomey and Lin, 1991). Self-monitoring refers to the ability for expressive control to regulate behavior to accommodate differing social circumstances. Those who engage in self-monitoring adjust their self-presentation in response to perceptions regarding a particular audience or occasion. This is to ensure an appropriate appearance. Individuals and societies differ substantially in their abilities and desires to engage in expressive control. Self-monitors try to understand how individuals and groups will perceive their actions. Some personality types commonly act spontaneously, while others are more apt to purposely control and consciously adjust their behavior. Individualist cultures prefer the ability to self-monitor rather than standards of public monitoring. Therefore, from a monitoring perspective, we expect a negative association between individualism and debt structure. We acknowledge that this is in contrast to our expectation of a positive association based on a transaction cost perspective.

We note that low uncertainty avoidance is concomitant with fewer rules and norms governing behavior than in high uncertainty-avoiding cultures. Higher uncertainty avoidance is associated with greater intolerance of deviant behavior (Gudykunst and Lee, 2003). We consider such a lack of tolerance for ambiguity to favor a greater predilection for accepting public monitoring. Therefore, based on a monitoring perspective, we expect a positive association between uncertainty avoidance and debt structure. We note that this is in contrast to our expectation of a negative association based on a transaction cost perspective.

From a monitoring perspective, we expect power distance to have a negative association with debt structure. Greater social hierarchy encourages the restriction of information to exclusive groups (Gray, 1988; Hofstede et al., 2010). With regard to masculinity, we could expect, from a monitoring perspective, a positive association with debt structure. Hofstede et al. (2010) and others note that masculinity is associated with public competition. However, Hofstede (2003) also notes that the competition ensuing from masculinity can lead to lying and the distortion of truth, in which case there would be a negative association between transparency and masculinity. In sum, the nature of the association between masculinity and the willingness to be monitored is ambiguous.

We expect, from a monitoring perspective, a positive association between debt structure and long-term orientation. Greater long-term orientation lessens the need for obfuscation to favorably shape short-term public disclosures (Koller, Goedhart and Wessels, 2005). With regard to indulgence versus restraint, from a monitoring perspective, we expect a positive association with debt structure. This is because Hofstede et al. (2010) and others associate indulgence versus restraint, with a greater predilection for free speech and public declaration of viewpoints.

2.4 Debt structure, institutions, and culture

In the preceding sections, we outline two channels of determination for debt structure: One is a transaction costs approach, wherein greater transaction costs, either institutionally or culturally driven, act to favor banks over bonds. The other channel is a monitoring perspective, wherein bonds will be more favored over banks when the costs of public monitoring are lower or when public monitoring is culturally palatable. Institutional and cultural factors that lower transaction costs may or may not positively resonate with factors that assuage public monitoring. Factors that lower transaction costs or make public monitoring more acceptable may or may not conflict. Indeed, those factors that do conflict are particularly useful to inspect in order to answer the question of which channel, transaction costs or monitoring, is most influential in determining debt structure. In Table 1 we briefly outline our expectations regarding the impact on debt structure of the institutional and cultural variables used in our empirical investigations, depending on whether the channel is transaction costs or monitoring.

Examining Table 1, we see a few variables that conflict with expectations, depending on whether one is considering a transaction cost or monitoring explanation. Individualism and uncertainty avoidance conflict among the cultural dimensions. From a transaction cost perspective, individualism (uncertainty avoidance) acts in favor of (against) bonds over banks; from a monitoring perspective, individualism (uncertainty avoidance) acts against (in favor of) bonds over banks. Similarly, there is conflict among the institutional dimensions. From a transaction cost perspective, limits to legal protection and political instability favor banks; from a monitoring perspective they favor bonds. An examination of the signs and significance of these variables from our empirical investigation will be of informationally insightful.

(Please insert Table 1 about here)

3. Methodology

3.1 Statistical specification and dependent variable

Initial empirical models and their estimates are based on the following equation:

$$W_i = \alpha_1 + \sum \beta_{1i} * X_i + \sum \beta_{2i} * Y_i + \sum \beta_{3i} * Z_i + \varepsilon_i \quad (1)$$

where Wi is a measure of the size of the private bond market to the size of banking system in the country, X_i is a vector of national institutional variables, Y_i is a vector of national culture variables, while Z_i is a vector of control variables, mainly macroeconomic factors. These control variables are described in the next section. We limit the countries in our sample to those emerging markets included by Karolyi (2015). Our sample period is 2000–2013, with a total of 21 countries and 241 country/year observations. Based on Breusch and Pagan (1980) tests, we report ordinary least squares (OLS) regression results.[3] We cluster standard errors by country. We include dummy variables to control for year fixed effects.

Using data from the World Bank's Global Financial Development Database, we form our dependent variable as the ratio of bond market capitalization of private corporations to the size of domestic

[3] We also estimate the results for the same sets of independent variables in Table 5, alternatively using random effect regression models. The results are qualitatively and quantitatively similar to those currently reported for the OLS model in Table 5. The results for the random effect regression are not reported here in the interest of brevity but are available upon request from the authors.

assets of deposit money banks. We refer to this variable as DEBT_STRUCTURE. Table 2 shows the country averages ranked according to the measure of bonds versus banks. Examining Table 2, we find that debt structure varies widely across our sample of 21 countries, with a high of 85.19 for Mexico and a low of 1.10 for Turkey. Table 2 also displays the country values for Karolyi (2015) six institutional dimensions and the six national culture dimensions of Hofstede et al. (2010).

(Please insert Table 2 about here)

3.2 Independent variables

3.2.1 Institutional and cultural variables

Our study focuses on independent variables that can be classified as national institutional characteristics and national cultural dimensions. To capture the institutional quality of each emerging market, we employ Karolyi (2015) six emerging market dimensions: 1) market capacity constraints (POOR_CAPACITY), 2) operational inefficiencies (POOR_OPERATION), 3) foreign accessibility restrictions (FOREIGN_RESTRICTIONS), 4) corporate opacity (CORPORATE_OPACITY), 5) limits on legal protection (POOR_LEGAL), and 6) political instability (POLITICAL_UNSTABLE). To assess the impact of culture on debt structure, we include as independent variables the six cultural dimensions of Hofstede et al. (2010): uncertainty avoidance (UAI), individualism versus collectivism (IDV), power distance (PDI), masculinity or gender differentiation (MAS), indulgence versus restraint (IVR), and long-term orientation (LTOWVS). As noted above, Kirkman et al. (2006) have noted the enormously widespread use of Hofstede's cultural dimensions. We have already discussed these variables above regarding our expectations of the impact of institutions and culture on transaction costs and the predilection for public monitoring.

3.2.2 Other control variables

Other control variables include the natural log of the GDP per capita (LNGDPCAP), as well as the one-period lag in the growth in GDP per capita. We include this second variable to control for economy-wide financial distress that could influence decisions about public versus private monitoring. Similarly, we

include a country-wide measure of leverage (LEVERAGE), which is the total of private domestic bonds plus bank size divided by stock market capitalization from the World Bank's 2015 Global Financial Development Database. We also include a measure of the soundness of banks, that is, the annual Z-score of banks from the World Bank's 2015 Global Financial Development Database (ZSCORE). Lastly, we include a measure of how the respective business community feels about the ease of obtaining a bank loan (EASE_LOAN). This variable is obtained from the annual Executive Opinion Survey of World Economic Forum. Table 3 provides the summary of the dependent and independent variables used in this study.

(Please insert Table 3 about here)

3.3 Hypotheses

Based on our literature review and theoretical framework, we form two mutually exclusive hypotheses.

H1: Transaction costs are significant drivers of debt structure, as evidenced by the concomitant negative significance of limits to legal protection and political instability; positive significance of individualism, and negative significance of uncertainty avoidance.

H2: The costs of monitoring and attitudes toward public monitoring are significant drivers of debt structure, as evidenced by the concomitant positive significance of limits to legal protection and political instability; negative significance of individualism, and positive significance of uncertainty avoidance.

These hypotheses reflect our discussion above, that the signs of POOR_LEGAL, POLITICAL_UNSTABLE, IDV, and UAI will differ depending on whether the primary driver of DEBT_STRUCTURE is transaction costs or public monitoring.

4. Empirical results

4.1 Bivariate correlations

The results of bivariate correlations between debt structure and cultural and institutional variables are presented in Table 4. We see that the simple bivariate correlations with DEBT_STRUCTURE that are significant are UAI (+) IDV (–), PDI (–), MAS (–), IVR (+), POOR_OPERATION (–),

FOREIGN_RESTRICTIONS (–), CORPORATE_OPACITY (–), and POLITICAL_UNSTABLE (–). However, in later multiple regression models and structural equation models, we evidence associations that differ in signs and significance of these bivariate correlations. For instance, long-term orientation (LTOWVS) and masculinity (MAS) are consistently positively significant in our models, while power distance (PDI) is not significant. We consider that the complex interplay of culture and institutions in a regression setting inevitably shapes the role of both cultural and institutional background beyond simple correlations.

(Please insert Table 4 about here)

4.2 Determinants of debt structure

Table 5 reports the results of OLS regressions using different sets of independent variables on DEBT_STRUCTURE. All models have variance inflation factors of less than 10 for all regressors, indicating that multicollinearity is unlikely to be a problem. Model 1 includes Karolyi (2015) six institutional quality variables, representing operations cost, foreign access restrictions, corporate opacity, poor market capacity, limits to legal protection, and political instability. The results of Model 1 are that corporate opacity is negatively significant at the 1% level. This suggests that more opaque corporations favor financing debt with banks rather than bonds. This result is consistent with bank financing avoiding public monitoring, in keeping with the notion that bank financing helps firms maintain opacity. Political instability is positively significant at the 10% level. This result is consistent with the monitoring explanation as well; if we consider that the monitoring of bad quality firms is less costly when there is less governance. The R-square value of 43%, suggest that institutional quality plays a large role in determining bond versus bank financing.

Model 2 adds Hofstede's six cultural dimensions to the independent variables. The results in CORPORATE_OPACITY again being negatively significant and POLITICAL_UNSTABLE is again positively significant. With regard to the cultural variables, long-term orientation, indulgence, uncertainty avoidance, and masculinity are all positively significant. Individualism is negatively significant. The R-squared value is now over 69%, suggesting culture is a very important determinant of debt structure.

Model 3 adds macroeconomic variables, *i.e.* the natural log of the GDP per capita and a one-period lag in the GDP per capita growth to the set of independent variables. It also adds the average Z-score for banks as a measure of bank soundness and a measure of the ease of obtaining loan financing from a bank. This results in EASE_LOAN being positively significant at the 5% level and lagged GDP per capita growth being negatively significant. This finding is consistent with greater financial distress leading to less enthusiasm for public monitoring. The measure of bank soundness, ZSCORE, is positively significant, suggesting that a preference for bonds over banks is not driven by the relative soundness of banks. Other variables have generally the same signs and significance as in Model 2. An exception is POOR_LEGAL, which is now positively significant at the 10% level.

Model 4 adds measures of leverage and the extent of use of international bonds by firms. These additional variables are not significant and make little difference in the signs and significance of the other variables. An exception is that the one-period lag in the GDP per capita growth is now not significant. As a robustness check, Model 5 removes POOR_CAPACITY from the set of independent variables. We do this out of concern that this measure of Karolyi (2015) incorporates the extent and health of the bond market. Excluding POOR_CAPACITY makes little difference to the signs and significance of the other variables.

(Please insert Table 5 about here)

4.3 Discussion of initial results

In our hypothesis section, we suggest that a transaction cost explanation of debt structure is supported by the concomitant negative significance of limits to legal protection and political instability, the positive significance of individualism, and the negative significance of uncertainty avoidance (H1). Alternatively, we suggest the costs of monitoring and attitudes toward public monitoring are supported by the concomitant positive significance of limits to legal protection and political instability, the negative significance of individualism, and the positive significance of uncertainty avoidance (H2).

The results of Table 5 strongly support H2 and offer no support for H1 whatsoever. The variable IDV (UAI) is significantly negative (positive) in every model. The variables POOR_LEGAL and POLITICAL_UNSTABLE are positively significant in the more comprehensive models. The combinations

of the signs and significance of these variables are consistent with a monitoring explanation of debt structure, as discussed above. Additionally, the signs and significance of the other independent variables are consistent with a monitoring explanation, particularly the positive significance of LTOWVS and IVR. The marginal positive significance of POOR_OPERATIONS is sharply inconsistent with a transaction cost explanation.

4.4 Structural-equation modeling

In this section, we present the results of structural equation modeling. These equations accounts for the fact that culture could have a preceding impact on institutions. To account for possible endogeneity and reduce multicollinearity, we test a model of structural equations. In addition to the primary regression model of Equation (1), we regress each measure of institutional quality on the cultural dimensions of Hofstede et al. (2010) *i.e.* PDI, MAS, IDV, UAI, LTOWVS, and IVR according to the following equation:

$$\text{Institutional Variable}_i = \alpha_0 + \beta_1 \text{UAI}_i + \beta_2 \text{IDV}_i + \beta_3 \text{PDI}_i + \beta_4 \text{MAS}_i + \beta_5 \text{LTOWVS}_i + \beta_6 \text{IVR}_i + \varepsilon_i \quad (2)$$

We repeat this regression for all the six Karolyi (2015) emerging market dimensions across 21 countries, *i.e.* POOR_CAPACITY, POOR_OPERATION, FOREIGN_RESTRICTION, CORPORATE_OPACITY, POOR_LEGAL, and POLITICALLY_UNSTABLE. Our primary equation with DEBT_STRUCTURE as the dependent variable uses the same set of independent variables as in Model 4 of Table 5.[4] We employ the following set of equations:

$$\text{UAI IDV PDI MAS LTOWVS IVR} \rightarrow \text{POOR_CAPACITY} \quad (3a)$$

$$\text{UAI IDV PDI MAS LTOWVS IVR} \rightarrow \text{POOR_OPERATION} \quad (3b)$$

$$\text{UAI IDV PDI MAS LTOWVS IVR} \rightarrow \text{FOREIGN_RESTRICTIONS} \quad (3c)$$

[4] Following Chin (1998), we consider that structured equation modeling, unlike an instrumented variable approach allows for simultaneous analysis of all the variables in the model instead of each variable being considered separately. Additionally, in structured equation modelling approach measurement error is not aggregated in a residual error term.

UAI IDV PDI MAS LTOWVS IVR →CORPORATE_OPACITY (3d)

UAI IDV PDI MAS LTOWVS IVR →POOR_LEGAL (3e)

UAI IDV PDI MAS LTOWVS IVR →POLITCAL_UNSTABLE (3f)

POOR_CAPACITY POOR_OPRATION FOREIGN_RESTRICTIONS CORPORATE_OPACITY POOR_LEGAL POLITICAL_UNSTABLE UAI IDV PDI MAS LTOWVS IVR L.GDPCAPGR LNGDPCAP ZSCORE EASE_LOAN LEVERAGE INTERNATIONA_BONDS → DEBT_STRUCTURE (3f)

The results of structural-equation analysis are that POOR_OPERATION, POOR_LEGAL, and POLITICAL_UNSTABLE are positively significant in determining DEBT_STRUCTURE, while CORPORATE_OPACITY and FOREIGN_RESTRICTIONS are negatively significant. With regard to the cultural variables, UAI, MAS, LTOWVS, and IVR are positively significant, while IDV is negatively significant. Comparing our results of structural-equation modeling in Table 6 with the results of Table 5, there are few if any differences with regard to the significance and concomitant signs of the institutional and cultural variables. This finding suggests our results for the impact of institutional quality and culture on DEBT_STRUCTURE in Table 5 are robust to the consideration of culture's impact on institutions.

In Table 6, we further affirm a monitoring explanation for debt structure, since, even when controlling for the impact of culture on institutions, our results of the negative significance of IDV and positive significance of UAI, POOR_LEGAL, and POLITICAL_UNSTABLE support H2.

(Please insert Table 6 about here)

4.5 Discussion

We have suggested two possible channels for what determines the ratio of bonds to bank financing in emerging markets. The first is a transaction-cost perspective. This view is similar to that of other papers that have examined stock market financing versus banks (Aggarwal and Goodell, 2009b; Aggarwal and Goodell, 2009a; Ergungor, 2004; Kwok and Tadesse, 2006). The channeling of funds from savers to

investors, or financial intermediation, is a necessary function in all countries and is generally undertaken primarily through financial institutions or through financial markets. Financing channels must resolve the issues of asymmetric information, adverse selection, and agency costs involved in financing contracts that cover the monitoring and collection of funds provided by savers to investors. Given that all optimal contracts are incomplete, the efficacy and efficiency of overcoming these contracting costs depend not only on explicit transaction costs but also on the implicit cost of the need for more vetting and information gathering in environments of less institutional integrity or in cultures more averse to uncertainty or less trust.

Alternatively, we have suggested a monitoring explanation. In this view, the predilection for debt financing as bonds over banks is dominated by bond financing being favored over bank financing when public monitoring is more comfortable or less uncomfortable for various institutional and cultural reasons. Table 1 highlights our theoretical framework; identifying particular factors that we posit are significant but have differing signs of association depending on a transaction cost or monitoring explanation.

Overall, we find robust support for a monitoring explanation of debt structure in emerging markets. In particular, we identify two institutional variables, limits on legal protection and political instability, for which a monitoring explanation would suggest a positively significant association with debt structure and a transaction cost explanation would suggest a negative association. We consistently find positive significance for limits to legal protection and political instability using various estimation procedures, supporting a public monitoring explanation.

Similarly, we identify in particular two cultural variables whose signs of association differ depending on a monitoring or a transaction cost explanation. For a monitoring explanation, we expect debt structure to have a negative association with individualism and a positive association with uncertainty avoidance; for a transaction-cost explanation, we would expect a positive association with individualism and a negative association with uncertainty avoidance. We consistently find a positive significance for limits to uncertainty avoidance and a negative significance for individualism, using various estimation procedures, again supporting a monitoring explanation. As a robustness check, we also confirm our results

with an alternative measure of governance. Additionally, our control variables for bank soundness (ZSCORE) and ease of obtaining a bank loan (EASE_LOAN) are positively significant. This finding suggests that our results are not driven by the financially distressed banking structure or difficulty in obtaining bank financing in the respective countries.

It is important to also discuss our results within a context of liquidity concerns as an explanation, since liquidity concerns have been often put forward as a cause of preference for bonds versus bank debt financing (e.g., Cantillo and Wright, 2000 Johnson, 1997; Khwaja and Mian, 2008). However, it should also be noted that there is mixed empirical support for whether it is banks or bonds that are favored during liquidity shocks (see Davydov and Vähämaa, 2013). Khwaja and Mian (2008) suggest that during liquidity shocks, banks pass on liquidity constraints to firms, largely because they are better able to issue new equities than new deposits. Khwaja and Mian (2008) however find, for the case of Pakistan, that larger firms, when banks constrict credit, are able to shift debt financing to bond financing. Following the argument of Khwaja and Mian (2008) we might expect bonds to be favored over banks during times of financial downturns. However, we find a positive association of bonds versus banks with the ease of getting a loan (EASE_LOAN). This result is inconsistent with liquidity shocks driving a move to bonds. On the other hand, Cantillo and Wright (2000) and others suggest that bank debt is more easily restructured during liquidity constraints. This would suggest, contra to Khwaja and Mian (2008), that banks are favored over bonds during economic downturns. However, we find little significant association of debt structure with the one-period lag in GDP per capita growth. An exception to this is the negative significance of L.GDPCAPGR in Model 3 of Table 5, which would suggest, contra Cantillo and Wright (2000), that economic upturns lead to a shift to bank financing.

Consideration of a liquidity explanation for our results can also be approached by examining the results for our cultural variables. We find a positive association of uncertainty avoidance and a preference for bonds over banks. This result is interesting in comparison with the results of Ramirez and Tadesse (2009) with regard to the association of national culture with cash holdings. Ramirez and Tadesse (2009) find firms in more uncertainty-avoiding cultures hold more cash as a percent of assets. This would suggest

a positive association of uncertainty avoidance and a preference for liquidity. Viewing this result alongside our result of a positive association of uncertainty avoidance and a preference for bonds over banks would suggest that bonds are more favored when liquidity is more desired. On the other hand, we find a positive association of bonds versus banks and long-term orientation. Under the assumption that liquidity is less required in environments of more long-term orientation, this would suggest bonds are favored when liquidity is less needed. Overall our results for the signs and significances of national culture variables on debt structure conflict with regard to a liquidity interpretation.

Taking together 1) the mixed empirical evidence of prior literature regarding the association of debt structure and the need for liquidity, 2) the positive significance of the ease of obtaining a loan and the little or no significance of the first lag of GDP per capita growth, and 3) the positive and significant coefficients on uncertainty avoidance and long-term orientation, we conclude that our results are not driven by an association of debt structure with changes in liquidity. We also note in this regard that examining the results of Table 5, national culture and institutional variables alone explain 69% or the variance in debt structure.

5. Alternative proxy for governance

As a robustness check, we replace Karolyi (2015) dimensions of institutional quality with Williams (2015) two measures of overall national governance. Like Karolyi (2015), Williams (2015) employs a principal component approach to generate cross-national comparison of institutional quality. Williams (2015) generates two indices of transparency that estimate cross-national differences in reporting transparency and governance accountability (INF_TRANSPARENCY and ACCT_TRANSPARENCY). The results of this modeling, shown in Table 7, are that, as in the other tables, DEBT_STRUCTURE is negatively related to the quality of governance. Additionally, there is little change in the significance of culture in shaping this relation. The variables UAI, LTOWVS, and IVR are again positively significant and IDV is again negatively significant. A difference from Table 6 is that MAS is no longer significant but PDI is negatively significant.

Overall, the results of replacing our primary measure of institutional quality, from Karolyi (2015) six dimensions, with Williams (2015) two transparency dimensions is that we confirm a negative association between governance and DEBT_STRUCTURE and confirm that national culture is very important in shaping this relation. Especially, we confirm our support for H2 in light of an alternative measure of national governance. The negative significance of INF_TRANSPARENCY and ACCT_TRANSPARENCY corresponds to the positive significance of POOR_LEGAL and POLITICAL_UNSTABLE in Tables 5 and 6. The variable IDV is again negatively significant and UAI is positively significant. Overall, the robustness test of replacing Karolyi (2015) institutional quality measures with Williams (2015) governance dimensions is evidence that our support for the monitoring explanation of debt structure (H2) is not dependent on the use of Karolyi (2015) dimensions.

(Please insert Table 7 about here)

6. Conclusions

Bond market development is integral to the financial development of emerging markets. Further, the choice between bond market financing and bank financing is an important element in a nation's financial picture. However, little research has investigated the institutional and cultural determinants of the choice between bond and bank financing. Recent research has investigated the cultural and institutional determinants of bank versus market financing. However, less literature has focused on the determinants of bond versus bank financing and even less on emerging markets while comprehensively controlling for institutional quality and national culture.

Our research design has attempted to account for both institutional quality and national culture, considering their interplay, especially the role of culture in shaping institutions. We highlight a theoretical framework that identifies several institutional and cultural variables whose signs of association with a predilection for private bonds over bank financing (debt structure) differ depending on a monitoring or a transaction cost-based explanation. Employing several tests, including structural-equation modeling, we find, among many results, that, in emerging markets, bonds are preferred over banks when there are less

corporate opacity and fewer foreign access restrictions, as well as in environments of greater political instability, transactions costs, and limits to legal protection. Bonds are also favored over banks in cultural environment of greater uncertainty avoidance, masculinity, long-term orientation, indulgence and less individualism.

Overall, we interpret our results as endorsing a monitoring explanation. Bonds being more favored in environments of less national governance is consistent with less institutional development leading to less costly consequences from unfavorable public monitoring. Our results, using a new measure of dimensions of institutional quality (Karolyi, 2015), suggest that the traditional story of institutional development and market development co-moving closely (e.g., Acemoglu and Johnson, 2005; Bebchuk and Weisbach, 2010; Beck and Levine, 2005; Claessens and Laeven, 2003) may actually be far more nuanced for private bond markets, particularly for emerging markets. Our results will be of great interest to researchers interested in the legal, social, and cultural environments of emerging markets.

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Table 1: Theoretical framework regarding institutional and cultural dimensions, and impact on debt structure through channels of transaction costs and public monitoring

This table outlines a summary of our theoretical framework regarding the impact of institutional and cultural variables on debt structure through alternative transaction costs and monitoring channels. The sign of association of our empirical results estimated in tables 5 and 6 is also shown.

Panel 1: Institutions, Transaction Costs, and Public Monitoring

Institutional-Quality Dimension	Transaction Costs	Public Monitoring	Empirical Result in this Study
Limits on Market Capacity	No expectation from a transaction cost or monitoring perspective		Insignificant
Operational Inefficiency	Transactions costs is inherent component of poor operations. (Expected sign: –)	No expectation	+
Restrictions on Foreign Investment	No expectation from a transaction cost or monitoring perspective		–
Corporate Opacity	Opacity raises transactions cost by increasing costs of resolving asymmetric information. (Expected sign: –)	Opacity associated with less public monitoring. (Expected sign: –)	–
Limits on Legal Protection	Poor legal recourse raises transactions costs as it undermines trust. More asymmetric information needs to be resolved. (Expected sign: –)	Less recourse concomitant with more comfort with public monitoring. Less consequences to unfavorable monitoring. (Expected sign: +)	+
Political Instability	Less consistency of governance raises transactions costs as it undermines trust. More asymmetric information needs to be resolved. (Expected sign: –)	Less consistency of governance concomitant with more comfort with public monitoring. Less certainty of consequences to unfavorable monitoring. (Expected sign: +)	+

Panel 2: Culture, Transaction Costs, and Public Monitoring

Cultural Dimension	Transaction Costs	Public Monitoring	Empirical Result
Uncertainty Avoidance	Greater uncertainty avoidance requires greater effort to resolve the asymmetric information inherent in market contracts. Transactions costs will increase. (Expected sign: –)	Low uncertainty avoidance concomitant with fewer rules and norms governing behavior than high uncertainty avoiding cultures. High UAI more intolerant of deviant behavior. Lack of toleration of ambiguity favors public monitoring. (Expected sign: +)	+
Individualism versus Collectivism	Greater individualism associated with greater confidence. Consequently, less effort invested in resolving the asymmetric information inherent in market contracts. Transaction costs will decrease. (Expected sign: +)	Individualism associated with need to sustain self-construal, and more self-monitoring. Cultures high on individualism focus on the self, not others. Individualist cultures prefer ability to self-monitor rather than standards of public monitoring. (Expected sign: –)	–
Power Distance	Greater power distance creates greater social fractionalization which lowers social trust. This increases transactions costs as greater effort needed to resolve asymmetric information when trust is lessened. (Expected sign: –)	Greater social hierarchy will lead to exclusion of information and poorer transparency. (Expected sign: –)	Insignificant
Masculinity	Greater confidence associated with less transaction costs. (Expected sign: +)	More masculine societies would be more concerned with the position of one entity versus another; so inclined to disclose more information about its financial position and performance to enable comparisons. Alternatively, competition engenders distortion of truth. (Expected sign: Unclear)	+
Long-Term Orientation	Long-term orientation will engender trust and so lower transaction costs. (Expected sign: +)	Greater long-term orientation, associated with lesser need for short-term obfuscation. Comfortable with public monitoring. (Expected sign: +)	+
Indulgence versus Restraint	A looser attitude may have a lowering effect on need to resolve asymmetric information and so lower transaction costs. (Expected sign: +)	Hofstede associates indulgence versus restraint with greater inclination for free speech. More comfort with public disclosure. (Expected sign: +)	+

Table 2: Country average levels of domestic bond financing versus bank financing, Karolyi institutional-quality dimensions, and Hofstede cultural dimensions

This table displays country-level averages for debt structure. This is for period 2000–2013. DEBT_STRUCTURE is the ratio of size of private domestic bonds to size of banks from World Bank's 2015 Global Financial Development Database. Also shown are the country values for the six dimensions of institutional quality of Karolyi (2015) and the six dimensions of national culture of Hofstede et al. (2010).

			Dimensions of Institutional Quality						National Culture Dimensions					
	COUNTRY	DEBT_ STRUCTURE	POOR OPERATION	POOR CAPACITY	FOREIGN RESTRICTIONS	CORPORATE OPACITY	POOR LEGAL	POLITICAL UNSTABLE	UAI	IDV	PDI	MAS	LTOWVS	IVR
1	Mexico	85.19	17	4	2	11	14	12	82	30	81	69	24	97
2	Korea	70.00	3	1	8	1	7	6	85	18	60	39	100	29
3	Chile	54.38	5	20	11	3	12	1	86	23	63	28	31	68
4	Peru	49.90	16	7	14	8	9	14	87	16	64	42	25	46
5	Brazil	46.67	7	10	4	6	17	9	76	38	69	49	44	59
6	Malaysia	45.80	1	5	10	4	1	8	36	26	100	50	41	57
7	Argentina	45.31	21	19	16	7	20	19	86	46	49	56	20	62
8	Thailand	30.46	4	6	12	10	4	15	64	20	64	34	32	45
9	South Africa	24.07	2	14	7	5	2	10	49	65	49	63	34	63
10	Czech	19.90	19	15	9	14	13	2	74	58	57	57	70	29
11	China	19.20	6	11	15	21	16	21	30	20	80	66	87	24
12	Indonesia	18.92	14	17	19	17	11	16	48	14	78	46	62	38
13	Russia	11.86	9	21	20	19	19	20	95	39	93	36	81	20
14	Hungary	11.41	15	3	3	15	18	7	82	80	46	88	58	31
15	Slovakia	9.54	20	13	6	13	15	4	51	52	100	100	77	28
16	Slovenia	7.59	18	2	5	2	6	3	88	27	71	19	49	48
17	India	4.89	10	9	18	9	5	17	40	48	77	56	51	26
18	Philippines	2.98	8	12	21	16	21	18	44	32	94	64	27	42
19	Poland	1.71	13	8	1	12	8	5	93	60	68	64	38	29
20	Colombia	1.39	12	16	17	20	3	13	80	13	67	64	13	83
21	Turkey	1.10	11	18	13	18	10	11	85	37	66	45	46	49

Table 3: Summary statistics and data sources

This table lists the mean, standard deviations, minimum and maximum; and sources of variables used in estimations reported in results tables for 21 countries from 2000 to 2013.

Variable	Mean	Std. Dev.	Min	Max	Obs.	Source
DEBT_STRUCTURE	28.70	26.52	0.04	106.94	241	Ratio of size of private domestic bonds to size of banks from World Bank's 2015 Global Financial Development Database
POOR_CAPACITY	10.49	6.11	1.00	21.00	241	Formed from measure of Karolyi (2015) by ranking countries in sample. Higher number is less efficient
POOR_OPERATION	10.56	5.81	1.00	21.00	241	Derived from Karolyi (2015) by ranking countries in sample. Higher number is less efficient
FOREIGN_ RESTRICTIONS	11.43	6.05	1.00	21.00	241	Derived from Karolyi (2015) by ranking countries in sample. Higher number is less efficient
CORPORATE_ OPACITY	10.83	6.15	1.00	21.00	241	Derived from Karolyi (2015) by ranking countries in sample. Higher number is less efficient
POOR_LEGAL	10.50	6.28	1.00	21.00	241	Derived from Karolyi (2015) by ranking countries in sample. Higher number is less efficient
POLITICAL_ UNSTABLE	11.83	5.72	1.00	21.00	241	Derived from Karolyi (2015) by ranking countries in sample. Higher number is less efficient
UAI	67.42	20.95	30.00	95.00	241	Uncertainty Avoidance, from Hofstede et al. (2010)
IDV	33.61	17.06	13.00	80.00	241	Individualism, from Hofstede et al. (2010)
PDI	71.83	15.05	46.00	100.00	241	Power Distance, from Hofstede et al. (2010)
MAS	53.15	16.23	19.00	100.00	241	Masculinity, from Hofstede et al. (2010)
LTOWVS	46.85	24.16	13.00	100.00	241	Long-Term Orientation, from Hofstede et al. (2010)
IVR	47.85	20.40	24.00	97.00	241	Indulgence versus Restraint, from Hofstede et al. (2010)
L.GDPCAPGR	3.58	3.70	–11.73	13.60	241	One period lag in GDP growth rate from World Bank Development Indicators
LNGDPCAP	8.46	0.92	6.36	10.08	241	Natural log of GDP per capita from World Bank Development Indicators
ZSCORE	14.55	10.70	–4.73	62.91	241	Average Z score of banks from World Bank's Global Financial Development Database
EASE_LOAN	3.30	0.67	1.69	4.78	241	How easy is it to obtain a bank loan in your country with only a good business plan and no collateral? [1 = very difficult; 7 = very easy], from World Economic Forum, Executive Opinion Survey
LEVERAGE	158.52	151.97	30.11	1131.81	241	Total of private domestic bonds plus bank size divided by stock market capitalization, from World Bank's Global Financial Development Database
INTERNATIONAL_ BONDS	4.89	4.02	0.02	17.18	241	Size of private international bond issues by corporations to GDP, from World Bank's Global Financial Development Database.
INF_ TRANSPARENCY	70.27	7.52	48.00	85.00	241	Information transparency from Williams (2015)
ACCT_ TRANSPARENCY	54.15	11.71	23.00	74.00	241	Accounting transparency from Williams (2015)

Table 4: Bivariate correlation of debt structure with national culture and institutions

This table shows bivariate Pearson correlation coefficients for DEBT_STRUCTURE paired with institutional and cultural variables. Variables are defined in Table 3. P values are reported in parentheses. *, **, *** are level of significance at 10%, 5% and 1% level respectively.

Bivariate Correlation with DEBT_STRUCTURE			
UAI	0.22*** (0.001)	POOR_CAPACITY	–0.08 (0.246)
IDV	–0.23*** (0.000)	POOR_OPERATION	–0.39*** (0.000)
PDI	–0.11* (0.075)	FOREIGN_RESTRICTIONS	–0.38*** (0.000)
MAS	–0.14** (0.035)	CORPORATE_OPACITY	–0.50*** (0.000)
LTOWVS	–0.01 (0.877)	POOR_LEGAL	0.03 (0.694)
IVR	0.39*** (0.000)	POLITICAL_UNSTABLE	–0.14** (0.032)

Table 5: Determinants of debt structure

Table shows results of pooled regressions with standard errors clustered at country level. Variance inflation factors for all variables in all models is less than 10. Variables are defined in Table 3. P values are reported in parentheses. *, **, *** are level of significance at 10%, 5% and 1% level respectively. We control for year fixed effects in all the regressions.

Dependent Variable: DEBT_STRUCTURE					
	1	**2**	**3**	**4**	**5**
POOR_CAPACITY	-0.01 (0.991)	–0.23 (0.750)	–0.85 (0.252)	–0.21 (0.546)	
POOR_OPERATION	-0.52 (0.553)	–0.04 (0.906)	0.53* (0.094)	0.87* (0.069)	0.91* (0.098)
FOREIGN_RESTRICTIONS	-1.69 (0.135)	–1.81 (0.225)	–1.92** (0.018)	–2.60*** (0.001)	–2.69*** (0.000)
CORPORATE_OPACITY	-2.29*** (0.007)	–2.94*** (0.006)	–3.43*** (0.003)	–3.13*** (0.003)	–3.10*** (0.003)
POOR_LEGAL	0.76 (0.270)	0.89 (0.172)	1.13* (0.071)	0.93* (0.053)	0.86* (0.094)
POLITICAL_UNSTABLE	1.87* (0.077)	1.70* (0.056)	3.30** (0.022)	3.34** (0.012)	3.31*** (0.008)
UAI		0.20** (0.019)	0.45** (0.022)	0.44** (0.014)	0.42** (0.028)
IDV		–0.62*** (0.004)	–1.00*** (0.000)	–1.14*** (0.000)	–1.15*** (0.000)
PDI		–0.10 (0.689)	–0.06 (0.716)	–0.18 (0.343)	–0.19 (0.328)
MAS		0.41** (0.050)	0.57** (0.013)	0.59*** (0.008)	0.57*** (0.010)
LTOWVS		0.42*** (0.002)	0.33*** (0.003)	0.31*** (0.004)	0.32*** (0.008)
IVR		0.57*** (0.001)	0.39*** (0.004)	0.27*** (0.000)	0.26*** (0.000)
L.GDPCAPGR			–0.86** (0.035)	–0.47 (0.241)	–0.41 (0.346)
LNGDPCAP			5.86 (0.165)	3.86 (0.231)	3.31 (0.276)
ZSCORE			0.89* (0.074)	0.89* (0.065)	0.86* (0.064)
EASE_LOAN			7.96** (0.016)	7.61** (0.016)	7.23** (0.023)
LEVERAGE				–0.01 (0.458)	–0.01 (0.403)
INTERNATIONAL_BONDS				1.48 (0.105)	1.65 (0.110)
INTERCEPT	40.41** (0.048)	–14.19 (0.168)	–113.16** (0.037)	–86.64** (0.044)	–78.64** (0.045)
Observations	241	241	241	241	241
R-square	0.43	0.69	0.76	0.77	0.77

Table 6: Determinants of debt structure: Structural-equation modeling

This table reports results for structural-equation modeling defined in equations 2 and 3. Variables are defined in Table 3. P values are reported in parentheses. *, **, *** are level of significance at 10%, 5% and 1% level respectively. Results are reported for 241 observations. We control for year fixed effects in all the regressions.

	DEBT_STRUCTURE	POOR_CAPACITY	POOR_OPERATION	FOREIGN_ RESTRICTIONS	CORPORATE_ OPACITY	POOR_LEGAL	POLITICAL_ UNSTABLE
POOR_CAPACITY	–0.18 (0.502)						
POOR_OPERATION	0.80*** (0.009)						
FOREIGN_RESTRICTIONS	–2.44*** (0.000)						
CORPORATE_OPACITY	–3.14*** (0.000)						
POOR_LEGAL	0.93*** (0.000)						
POLITICAL_UNSTABLE	3.26*** (0.000)						
UAI	0.38*** (0.000)	0.19*** (0.000)	–0.00 (0.977)	–0.07*** (0.000)	0.05*** (0.006)	0.13*** (0.000)	–0.07*** (0.000)
IDV	–1.12*** (0.000)	–0.04* (0.085)	0.02 (0.541)	–0.19*** (0.000)	–0.18*** (0.000)	–0.01 (0.848)	–0.16*** (0.000)
PDI	–0.14 (0.110)	0.03 (0.302)	–0.02*** (0.544)	–0.02 (0.497)	0.03 (0.221)	0.10*** (0.000)	–0.03 (0.183)
MAS	0.61*** (0.000)	0.18*** (0.000)	0.04 (0.150)	0.03 (0.137)	0.27*** (0.000)	0.16*** (0.000)	0.09*** (0.000)
LTOWVS	0.28*** (0.001)	–0.08*** (0.000)	–0.06*** (0.013)	–0.15*** (0.000)	–0.07*** (0.000)	–0.00 (0.995)	–0.11*** (0.000)
IVR	0.24** (0.047)	–0.09*** (0.000)	–0.05* (0.074)	–0.22*** (0.000)	–0.16*** (0.000)	–0.08*** (0.003)	–0.14*** (0.000)
L.GDPCAPGR	–0.22 (0.457)						
LNGDPCAP	6.30** (0.026)						
ZSCORE	0.81*** (0.000)						
EASE_LOAN	7.02*** (0.002)						
LEVERAGE	–0.01 (0.126)						
INTERNATIONAL_BONDS	1.21*** (0.003)						
INTERCEPT	–90.41*** (0.001)	–3.88 (0.249)	14.12*** (0.000)	39.11*** (0.000)	7.72** (0.020)	–9.34** (0.014)	31.12*** (0.000)
LR Chi-square				1250.86*** (0.000)			

Table 7: Determinants of debt structure: Robustness tests with alternative governance measures

This table reports the results of structural-equation modeling. Variables are defined in Table 3. P values are reported in parentheses. *, **, *** are level of significance at 10%, 5% and 1% level respectively. Results are reported for 241 observations. We control for year fixed effects in all the regressions. Models used in this table are:

- UAI IDV PDI MAS LTOWVS IVR → ACCT_TRANSPARENCY
- UAI IDV PDI MAS LTOWVS IVR → INF_TRANSPARENCY
- ACCT_TRANSPARENCY INF_TRANSPARENCY UAI IDV PDI MAS LTOWVS IVR L.GDPCAPGR LNGDPCAP ZSCORE EASE_LOAN LEVERAGE INTERNATIONAL_BONDS → DEBT_STRUCTURE

	DEBT_STRUCTURE	**ACCT_TRANSPARENCY**	**INF_TRANSPARENCY**
ACCT_TRANSPARENCY	–0.36* (0.058)		
INF_TRANSPARENCY	–0.95*** (0.001)		
UAI	0.34** (0.011)	0.12*** (0.000)	0.12*** (0.000)
IDV	–0.41*** (0.001)	0.24*** (0.000)	0.19*** (0.000)
PDI	–0.40*** (0.001)	–0.22*** (0.000)	0.06* (0.094)
MAS	0.08 (0.516)	–0.06 (0.172)	–0.07** (0.025)
LTOWVS	0.25** (0.043)	–0.07* (0.058)	0.01 (0.763)
IVR	0.60*** (0.000)	0.00 (0.998)	0.08*** (0.009)
L.GDPCAPGR	0.27 (0.512)		
LNGDPCAP	8.12** (0.050)		
ZSCORE	0.61*** (0.000)		
EASE_LOAN	1.69 (0.491)		
LEVERAGE	–0.00 (0.944)		
INTERNATIONAL_BONDS	2.70*** (0.003)		
INTERCEPT	–7.47 (0.719)	60.01*** (0.000)	51.22*** (0.000)
LR Chi-square		308.70*** (0.000)	

Appendix 1: Table of Pearson Correlation Coefficients: Independent Variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	POOR_CAPACITY	1.00																			
2	POOR_OPERATION	0.18	1.00																		
3	FOREIGN_RESTRICTIONS	-0.05	0.55	1.00																	
4	CORPORATE_OPACITY	0.21	0.52	0.50	1.00																
5	POOR_LEGAL	0.39	0.33	0.17	0.36	1.00															
6	POLITICAL_UNSTABLE	-0.05	0.35	0.73	0.53	0.34	1.00														
7	UAI	0.44	-0.02	-0.33	-0.18	0.12	-0.34	1.00													
8	IDV	0.15	0.15	-0.37	-0.10	0.16	-0.26	0.03	1.00												
9	PDI	-0.13	-0.05	0.24	0.27	0.15	0.19	-0.45	-0.29	1.00											
10	MAS	0.20	0.13	-0.12	0.41	0.27	0.09	-0.32	0.46	0.15	1.00										
11	LTOWVS	-0.19	-0.11	-0.02	0.06	0.14	-0.11	-0.16	-0.01	0.15	-0.05	1.00									
12	IVR	0.11	0.00	-0.26	-0.15	-0.16	-0.09	0.22	-0.15	-0.13	0.09	-0.73	1.00								
13	L.GDPCAPGR	-0.08	-0.01	0.14	0.18	0.06	0.15	-0.21	-0.06	0.11	0.05	0.35	-0.39	1.00							
14	LNGDPCAP	0.16	-0.26	-0.69	-0.44	-0.06	-0.74	0.60	0.23	-0.27	-0.10	0.23	0.13	-0.10	1.00						
15	ZSCORE	0.19	0.06	-0.02	0.17	0.03	-0.11	-0.28	0.36	-0.03	0.35	0.04	-0.12	0.10	-0.20	1.00					
16	EASE_LOAN	-0.26	-0.20	-0.04	-0.22	-0.56	-0.28	-0.40	0.00	0.21	-0.13	0.02	-0.17	0.12	-0.16	0.16	1.00				
17	LEVERAGE	-0.59	-0.26	-0.10	-0.43	-0.16	-0.14	-0.21	0.01	0.26	-0.11	0.03	0.10	-0.21	0.14	-0.21	0.13	1.00			
18	INTERNATIONAL_BONDS	0.19	-0.18	-0.27	0.02	0.05	-0.31	-0.08	0.04	0.20	0.27	0.41	-0.28	0.06	0.32	-0.07	-0.02	-0.17	1.00		
19	INF_TRANSPARENCY	0.11	-0.07	-0.39	-0.24	-0.03	-0.63	0.40	0.31	-0.22	-0.03	-0.17	0.19	-0.17	0.59	0.04	0.00	0.20	-0.06	1.00	
20	ACCT_TRANSPARENCY	0.28	-0.06	-0.40	-0.43	-0.15	-0.63	0.41	0.39	-0.51	-0.04	-0.22	0.13	-0.26	0.36	0.23	0.11	-0.13	0.07	0.56	1.00