

Is Short-Term Debt a Substitute or a Complement to Good Governance?

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Abstract

Short-term debt exposes firms to credit supply shocks and liquidity risk. Short-term debt can also reduce potential agency conflicts between managers and shareholders by exposing managers to more frequent monitoring by the market. This paper examines whether internal monitoring through independent boards and stronger shareholder protections can substitute for external monitoring through

the use of short-term debt. The analysis finds that the relationship between debt maturity and governance depends on shareholder rights in a given country. In countries with stronger investor protection, governance and short-term debt act as substitutes. Instrumenting the institutional environment with legal origin confirms the results.

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Is Short-Term Debt a Substitute or a Complement to Good Governance?

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1. Introduction

The global financial crisis has renewed interest in short-term funding and the dangers associated with its use. Inability of financial firms to roll over debt to meet their obligations has been acknowledged by academics and policy makers to be one of the main drivers of contagious defaults in the global financial crisis.¹ Although the focus and regulatory response has been on financial firms, the risks associated with short-term debt are not contained to financial firms alone. Corporate debt maturity had important real economic effects for industrial firms during the financial crisis. In particular, firms with high short-term debt had lower corporate investment following the crisis (Almeida et al., 2012; Duchin et al., 2010).

Although short-term debt exposes firms to credit supply shocks and liquidity risk, short-term debt can also reduce potential agency conflicts between managers and shareholders by exposing managers to more frequent monitoring by the market.² As short-term debt comes up for renewal, the firm and the managers are scrutinized by lenders and rating agencies before the debt of the firm is rolled over. Myers (1977) argues that short-term debt can be an effective mechanism to monitor management to alleviate the underinvestment problem. Rajan and Winton (1995) show that short-term debt allows creditors to effectively monitor managers with the least amount of effort. Short-term debt also allows for efficient liquidation by transferring control rights to the hands of the creditors if the manager fails to pay (Hart and Moore, 1998). Stulz (2000) and Harvey, Lins, and Roper (2004) find empirical support for these theories. They examine capital structure in emerging markets, where agency costs are expected to be high, and find that short-term debt can mitigate agency problems in these markets.

Given both the negative effects of liquidity risk and the positive effects of monitoring associated with the use of short-term debt, a natural empirical question is whether firms that have alternative ways of reducing agency problems utilize lower amounts of short-term debt. In this

¹ See for instance, Brunnermeier, Crockett, Goodhart, Persaud, and Shin (2009), Financial Stability Forum (2009a, 2009b).

² Theoretical literature suggests that firms that use more short-term debt face more frequent renegotiations and are more exposed to credit supply shocks. Diamond (1991) and Titman (1992) show that when there is a credit shock, firms may face difficulties rolling over short-term debt. He and Xiong (2012a) develop a dynamic model where staggered short-term debt increases the possibility of runs by creditors on a firm. While short-term debt is effective in transferring control rights to debt holders it may also lead creditors to liquidate too often (Hart and Moore, 1998). In another paper, He and Xiong (2012b) show that short-term debt exacerbates the conflict of interest between shareholders and debt holders. Consistent with the theoretical literature, Gopalan, Song, and Yerramilli (2014) show that firms with short-term financing have higher costs of debt.

paper, we examine whether internal monitoring through independent boards and stronger shareholder protections can substitute for external monitoring through the use of short-term debt.

Past research suggests that leverage and debt maturity structure choices could be effective in mitigating agency conflicts (Grossman and Hart, 1982; Jensen, 1986; Stulz, 1990; Hart and Moore, 1995). Good corporate governance and independent boards are also expected to be effective in mitigating agency problems (Bhagat, Carey, and Elson, 1999; Yermack, 1996; Gompers, Ishii, and Metrick, 2003; Klein, 2002). In addition, the law and finance literature suggests that the extent to which debt contracts can be used to mitigate agency problems depends on the institutional environment, and in particular the laws surrounding creditor and investor rights and the quality of enforcement of these laws (La Porta et al., 1998 and 2000; Diamond, 2004; Burkart et al., 2003).

Given the trade-off between monitoring benefits and liquidity risk associated with short-term debt, we conjecture that firms in countries with better legal protection of shareholders would reduce the need for costly external monitoring using short-term debt. If strong investor protection reduces discretion of insiders and allows for more efficient internal monitoring, then we would expect governance and short-term debt to act as substitutes. An independent board trying to maximize shareholder value, for instance, would choose lower levels of short-term debt if the benefit from external monitoring is low.

To empirically test these conjectures, we gather a large firm-level data set consisting of about 8,453 firms from 23 different countries. Our data set includes a wide range of governance attributes for these firms over the 2003 – 2007 period. These governance attributes, which are collected and maintained at the International Shareholder Services (ISS) database include a wide coverage of key governance features, such as board characteristics, managerial and director compensation, executive stock ownership, auditing practices and shareholder rights. Using these governance attributes, we construct a number of governance related variables that are likely to reflect board and governance qualities of firms. Our set of variables includes the overall governance index that provides a holistic view of firm-level governance quality (Aggarwal et al., 2009; 2011), board quality, board independence, board size and CEO-chairman duality. In the extended analysis, we supplement this list with variables related to the independence levels of compensation, nomination and audit committees.

In the initial step of our analysis, we confirm the negative association between governance quality and the share of short-term in total debt. In particular, the marginal effects of governance variables on short-term debt are all negative in our baseline regressions. For instance, a 10-percentage point increase in our overall firm governance index, which ranges from zero to one, leads to a 10.7 percentage point decrease in the portion of short-term debt in total debt. The use of alternative governance metrics in regressions leads to similarly large economic effects. In running these regressions, we control for a large set of firm- and country-specific factors that may affect short-term debt.

Next, we investigate whether the relationship between debt maturity and governance depends on the institutional environment that determines the extent of investor protection in a given country. We argue that countries with better legal protection of shareholders would reduce the need for costly external monitoring using short-term debt. If strong shareholder rights reduce discretion of insiders and allow for more efficient internal monitoring, then we would expect governance and short-term debt to act as substitutes. To empirically test this conjecture, we interact each of our governance variables with a variable that is likely to capture the level of investor protection in sample countries and include them as explanatory variables for short-term debt. Our candidate proxy is the minority investor protection index that is constructed in the World Bank's Doing Business Survey. In our estimations, these interaction terms attain statistically significant and negative coefficients, suggesting that governance and board independence are negatively related to short-term debt in countries with greater investor protection. Thus, good governance and short-term debt become stronger substitutes when the investor rights are protected by law.

To alleviate endogeneity concerns, we instrument investor protection with legal origin. La Porta et al. (1998) suggest that investor rights are largely a function of national legal origin, and that legal systems based on common law offer external investors better protection than those based on civil law. Hence, we use instrumental variable estimation and use legal origin as an instrument for investor protection. The findings are similar to the baseline results; governance and short-term debt act as substitutes in countries with greater investor protection.

The prior literature suggests that a similar trade-off between reduction in agency costs and increase in distress costs applies to the use of leverage. We use leverage as the dependent variable and obtain similar results. We find that the relationship between leverage and governance, similar

to the relationship between governance and debt maturity, depends on the larger institutional environment and in particular the extent of investor rights in a given country.

Our paper complements studies that examine the determinants of short-term debt. Barclay and Smith (1995), Guedes and Opler (1996), Stohs and Mauer (1996) and others find that debt maturity is determined by firm characteristics such as asset maturity, growth opportunities and firm size. Datta, Iskandar-Datta, and Raman (2005) provide evidence that managerial ownership is an additional determinant of corporate debt maturity. Custodio, Ferreira and Laureano (2013) show that corporate use of long-term debt has decreased in the United States over the past three decades. They find that the decline was driven by firms with higher information asymmetry and new firms issuing public equity. More directly related to our study are two papers that have examined the impact of corporate governance on debt maturity. Harford, Li and Zhao (2008) find that stronger boards force the firm to hold more debt and more short-term debt. Senbet and Tosun (2019), on the other hand, find that board independence is associated with lower use of short-term debt. Both papers examine US firms and do not examine the impact of institutional environment on the governance-debt maturity relationship, which is the focus of our paper.

Our paper also complements the literature that examines country-level determinants of debt maturity. Demircug-Kunt and Maksimovic (1999) find that the size of the banking sector, stock market development levels, inflation and legal institutions are important determinants of debt maturity. Fan, Titman, and Twite (2012) find that a country's legal and tax system, corruption, and the preferences of capital suppliers explain a significant portion of the variation in leverage and debt maturity ratios. Booth et al. (2001) find that firms have longer duration debt in countries where the legal system provides greater investor protection. Diamond (2004) argues that the extent to which creditors are legally protected should have an impact on the optimal maturity structure of debt. Consistent with this view, Bae and Goyal (2009) report evidence of shorter debt maturity in countries where contracts are poorly enforced. Qian and Strahan (2007) and Giannetti (2003) examining bank loans and private companies respectively, show that debt maturity is longer in countries that offer greater creditor rights.

The effect of governance quality on debt maturity is documented by a number of papers using a country-specific setting. Using data from Turkey, Arslan and Karan (2006) show that both concentrated ownership structure and the presence of large shareholders are associated with the use of long-term debt. Kim (2015) finds that Korean firms with poor governance tend to have a

higher debt ratio (especially short-term debt ratio) than firms with good governance. Kirch and Terra (2012) analyze firm-level data from five South American countries and conclude that the institutional quality of a country has a significant positive effect on the level of long-term debt in a firm's financial structure. Using the ownership structures of French firms, Ben-Nasr, Boubaker, and Rouatbi (2015) find that firms with multiple large shareholders tend to have debt with shorter maturity. Awartani, Belkhir, Boubaker, and Maghyereh (2016) show that stronger rule of law, better regulatory effectiveness, better legal protection of creditors, and more developed financial intermediaries are associated with greater use of long-term borrowing by Middle East and North African firms. In contrast with these region- and country-specific studies, our study exploits the richness of international data to investigate the role of cross-country variation in institutional features that mediate the role of governance on debt maturity.

Our paper contributes to the three strands of the literature, by showing that the governance-debt maturity relationship depends on the larger institutional environment and in particular the strength of investor protection. By examining cross-country differences in legal origin, we are able to address some of the endogeneity concerns associated with examining debt maturity and governance. The rest of the paper is organized as follows. The next section describes the data and methodology. Section 3 presents the empirical results, including baseline regressions that show the effect of governance on short-term debt, the role of investor protection on the relationship between governance and debt maturity, instrumental variables regressions that are aimed to address endogeneity concerns and a number of robustness tests for the alternative definitions of the governance variables. Section 4 concludes the paper.

2. Data

This section provides detailed information about the sample of firms, data sources and how we construct our variables. Our discussion starts with sample selection. Then, we present the construction of the governance and board measures used in our study, as well as the measures of country level institutional quality. Finally, we present the construction of the short-term debt measure and firm level controls.

2.1 Sample

We begin our sample construction by obtaining financial information of all the firms covered by Compustat-Global. To obtain governance information, we match these firms to the ISS database of RiskMetrics by using the international securities identification number (ISIN) and CUSIP. This data set contains information about governance attributes of the US and international firms from 2003 to 2007.³ It covers firms from major stock indices which include but are not limited to Standard and Poor's (S&P) 500, S&P Small Cap 600, Russell 3000, MSCI Europe, and FTSE All Share Index. Our final sample consists of 8,453 unique firms in 23 countries. This translates to a maximum of 33,714 firm-year observations. Our observations are from 26 different industries and the industry definitions come from RiskMetrics.

Panel A in Table 1 provides a summary of the country coverage of our sample. The most represented country in our sample is the United States (71.67% of the observations) with 6,090 firms, followed by Japan (7.91%) with 596 firms and the United Kingdom (5.33%) with 531 firms. The least represented countries are Portugal (0.21%), New Zealand (0.22%) and Austria (0.28%). Panel B shows the distribution of sample firms over the 26 industries. Banking, Capital Goods, and Software & Services are the largest industries representing 10.17%, 8.55% and 7.73% of the sample, respectively. The smallest industries in our sample are Household & Personal Products (0.93%), Food & Staples Retailing (1.08%) and Hotels Restaurants & Leisure (1.12%).

³ The country coverage of the ISS governance database has dropped to only a handful after 2008, which limits its ability to provide cross-country comparisons after this date.

Table 1. Country and Industry Coverage

This table presents the distribution of observations and unique firms among the countries. Panel A presents the country coverage. Panel B presents the industry coverage. Industry definitions are from Institutional Shareholder Services (ISS) database.

Panel A: Country Coverage				
Countries	# of Observations	% of Observations	# of Unique Firms	% of Unique Firms
Australia	479	1.42	125	1.48
Austria	95	0.28	23	0.27
Belgium	121	0.36	30	0.35
Canada	858	2.54	221	2.61
Denmark	116	0.34	26	0.31
Finland	153	0.45	33	0.39
France	413	1.23	97	1.15
Germany	427	1.27	100	1.18
Greece	193	0.57	43	0.51
Hong Kong SAR, China	252	0.75	65	0.77
Ireland	143	0.42	34	0.40
Italy	297	0.88	77	0.91
Japan	2,668	7.91	596	7.05
Netherlands	251	0.74	58	0.69
New Zealand	74	0.22	20	0.24
Norway	103	0.31	25	0.30
Portugal	70	0.21	15	0.18
Singapore	271	0.8	58	0.69
Spain	245	0.73	60	0.71
Sweden	220	0.65	54	0.64
Switzerland	304	0.9	72	0.85
United Kingdom	1,798	5.33	531	6.28
United States	24,163	71.67	6090	72.05
Total	33,714	100	8,453	100

Table 1 continued.

Panel B: Industry Coverage				
Industry Groups	# of Observations	% of Observations	# of Unique Firms	% of Unique Firms
Automobiles & Components	567	1.68	142	1.52
Banks	3,430	10.17	898	9.59
Capital Goods	2,881	8.55	709	7.57
Commercial Services & Supplies	1,376	4.08	385	4.11
Consumer Durables & Apparel	1,492	4.43	369	3.94
Consumer Services	567	1.68	216	2.31
Diversified Financials	1,023	3.03	279	2.98
Energy	1,258	3.73	335	3.58
Food & Staples Retailing	365	1.08	91	0.97
Food Beverage & Tobacco	975	2.89	239	2.55
Health Care Equipment & Services	2,173	6.45	563	6.01
Hotels Restaurants & Leisure	376	1.12	204	2.18
Household & Personal Products	313	0.93	78	0.83
Insurance	849	2.52	215	2.30
Materials	2,120	6.29	522	5.58
Media	1,055	3.13	267	2.85
Pharmaceuticals & Biotechnology	1,465	4.35	464	4.96
Pharmaceuticals, Biotechnology & Life Sciences	381	1.13	381	4.07
Real Estate	1,384	4.11	374	3.99
Retailing	1,423	4.22	376	4.02
Semiconductors & Semiconductor Equipment	712	2.11	198	2.11
Software & Services	2,606	7.73	724	7.73
Technology Hardware & Equipment	2,555	7.58	752	8.03
Telecommunication Services	643	1.91	178	1.90
Transportation	854	2.53	209	2.23
Utilities	871	2.58	194	2.07

2.2. Firm-Level Governance Measures

We closely follow Aggarwal et al. (2009, 2011) to construct our governance and board measures for each firm-year observation. Aggarwal et al. (2009) use 44 governance attributes compiled by ISS. For each governance attribute, ISS has a minimally acceptable level for good governance. For instance, “*Board is controlled by more than 50 % independent outside directors.*” is a governance attribute. If a firm meets this criterion, it receives a score of one and zero if the firm does not meet the criterion. Each of the 44 attributes is assigned a value of one if the stated condition is met by the firm, and zero if the condition is not met. Thus, a firm can accumulate a maximum value of 44 points from all of the 44 attributes or attain a total value of zero at the minimum. The explanations to the 44 governance attributes are provided in Table A1. For standardization purposes, we aggregate the scores across the governance attributes and divide it by the number of attributes to construct our governance indices. Our governance indices are, therefore, in percentage terms. Higher values of governance index imply better governance. If a firm satisfies all the minimally acceptable governance attributes, its governance index takes a value of 1. If an attribute is missing from the data set or not reported, we discard that attribute and compute the index based on the average of non-missing attributes.

We construct three different governance indices based on these attributes. First, we follow Aggarwal et al. (2009) and construct *gov44*, which uses all the 44 governance attributes. As a robustness, we also consider *gov38*, which uses all 44 attributes except the six attributes that are related to anti-takeover provisions. We discard these anti-takeover provisions because they are related to laws and regulations not directly comparable across countries. *gov44* and *gov38* are highly correlated; thus, we only report the results for *gov44* in baseline regressions and show the results for *gov38* while discussing the robustness of the results with respect to variable definitions.

We also create additional indices to measure board independence and quality. *gov_board* consists of the 25 attributes related to board characteristics, which are in the top portion of Table A1. These attributes cover board characteristics on board independence, size, board member election policies, the role of shareholders in selecting board members, CEO chairman duality, and others. In addition to the board index, we use the board independence (*gov_indep*) index to capture the independence levels of boards. Independent directors’ monitoring role and its effects on

shareholder value are extensively emphasized in the literature.⁴ Therefore, board independence is one of the most important governance measures among the governance elements. The included attributes in this index are “CEO serves on the boards of two or fewer public companies” (attribute #2), “Board is controlled by more than 50% independent outside directors” (attribute #3), “No former CEO on the board” (attribute #6), “Compensation committee composed solely of independent outsiders” (attribute #7), “Chairman and CEO are separated or there is a lead director” (attribute #8), “Nominating committee composed solely of independent outsiders” (attribute #9), “Outside directors meet without CEO and disclose number of times met” (attribute #21) and “Audit committee composed solely of independent outsiders” (attribute #36). *gov_indep* takes values between zero and one and higher values indicate more independent boards.

We use board size as an additional board characteristic. Board size indicates the number of board members of a given firm. As discussed in Anginer et al. (2016), a small board may find it difficult to oppose management, but a large board may be susceptible to free-rider problems. Therefore, board size and governance may be linked in a non-linear fashion and intermediate board size may be the most effective. We create an effective board size measure (*size_eff*) to capture the non-linear effect of board size. This measure ranges from 1 to 3. A higher score indicates a more effective board size, thus better governance. If the board size is between 9 and 12, it takes a value of 3. If the board size is 6-8 or 13-15, then it takes a value of 2. If the board size is less than 6 or greater than 15, then it takes a value of 1.

As our final governance measure, we create an indicator for CEO duality (*ceo_chair*), which is emphasized as an important governance attribute in the literature.⁵ This measure is based on attribute “Chairman and CEO are separated or there is a lead director” (#8) and it ranges from 1 to 3, where a higher value indicates a higher degree of separation between CEO and chairman of the board, hence better governance. The characteristics and corresponding scores of the non-index governance variables are in Table A2 of the Appendix.

2.3. Country-Level Governance Measures

⁴ See for instance Fama (1980), Fama and Jensen (1983), Rosenstein and Wyatt (1990), Chhaochharia and Grinstein (2007).

⁵ See for instance Adams, Almeida, and Ferreria (2005) and Pathan (2009).

We use two institutional measures to capture the differences in investor rights across countries. In the regression specifications, we interact country level institutional variables with firm level governance measures to examine how the effect of governance on maturity varies across different institutional environments.

Our first country level governance measure is investor protection (*investor*). This variable measures the extent of minority shareholder protection against expropriation by the controlling shareholders. It ranges from zero to 10 and higher values imply better protection of minority shareholders. We use the “strength of minority investor protection” variable from “World Bank Doing Business Surveys” to construct this measure. The data for constructing this variable comes from surveys administered to corporate and securities lawyers and includes sections on countries’ disclosure requirements for related-party transactions, extent of director liability in lawsuits, shareholders’ ability to initiate lawsuits, shareholders’ rights in major corporate decisions, existence of governance mechanisms controlling excessive board control and the transparency of corporate decisions.⁶ The survey for this measure begins in 2006. We use the value at year 2006 to back fill the missing values for each country. Within-country variation of this variable is highly persistent. Hence, filling missing values with most available data would not create a large bias. Moreover, our focus in this paper is on cross-country variation in the debt-maturity relationship rather than within-country variation.

Our second variable is the legal environment. We use a dummy variable (*common law*) that takes a value of one for common-law countries (the United States; the United Kingdom; Australia; New Zealand; Canada; Hong Kong SAR, China; Ireland; and Singapore) and zero for civil law countries. This variable comes from Djankov, McLiesh, and Shleifer (2007) and is similar to the one described in La Porta et al. (1998). We use this variable to instrument investor protection.

2.4. Short-Term Debt, Leverage, and Control Variables

We use Compustat-Global to measure short-term debt and to construct the control variables. *std* is defined as the ratio of debt due in less than one year divided by total debt. Total debt is the sum of debt due in less than one year (Compustat item “dlc”) and long-term debt

⁶ Further details for constructing the *investor* variable are available on the Doing Business website located at: <https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB19-Chapters/DB2019-Data-Notes.pdf>.

(Compustat item “dltt”). We discard observations where the ratio is not between zero and one. We define leverage as the ratio of total debt to total assets (Compustat item “at”).

When examining the relationship between short-term debt and governance, we use a set of firm specific control variables that have been previously found to affect leverage and debt maturity (Barclay and Smith 1995; Guedes and Opler, 1996; Stohs and Mauer, 1996; Opler et al., 1999; Barclay et al., 2003; Datta et al., 2005; Harford et al., 2008; Fan et al., 2012; Denis and Sibilkov, 2009). Due to data limitations, we follow Rajan and Zingales (1995) and Fan et al. (2012) to determine the set of control variables. Our first control variable is *size*, which is the natural logarithm of total assets. As shown in previous literature, size is an important determinant of maturity structure. Larger firms are able to borrow long-term debt because they tend to have lower issuance costs, lower information asymmetry and better credit quality. The second control variable is asset tangibility (*asset_tangibility*). It is measured as the ratio of net property, plant and equipment (Compustat item “ppent”) to total assets. When asset tangibility is higher, creditors are more willing to bear the risk since these assets act as collateral and they are more valuable in the case of liquidation. The third control variable is profitability, which is measured by return on assets (*roa*). We compute return on assets as the ratio of net income (Compustat item “ni”) to total assets. We expect profitable firms to have easier access to long term debt, leading to a negative marginal effect of profitability on short-term debt.

The fourth control variable is asset turnover (*asset_turnover*), which is calculated as net sales (Compustat item “sale”) divided by total assets (Compustat item “at”). As argued in Demirguc-Kunt and Maksimovic (1999), firms with high turnover ratios may need short-term debt to support their sales. Because these firms are likely to generate current assets in the form of cash and account receivables, they may have an incentive to match the maturity of these short-term assets to liabilities by holding more short-term liabilities. Thus, high turnover firms may hold more short-term debt. Our final control variable is market-to-book ratio (*mb*). It proxies for growth and investment opportunities as well as for the costs of financial distress. We measure it as the ratio of market value of equity to book value of equity (Compustat item “ceq”). We calculate the market value of equity by utilizing the “Security Daily” database in Compustat Global. Myers (1977)

argues that high growth firms may reduce agency costs by holding more short-term debt. Hence, the predicted marginal effect of *mb* is positive.⁷

We use leverage as a control variable whenever short-term debt is the dependent variable. Barclay, Marx, and Smith (2003) discuss the joint determination of leverage and maturity. We argue that firms make their maturity decisions after setting their leverage levels and higher leverage firms use less short-term debt. Following Senbet and Tosun (2019), we use the 2SLS approach and instrument leverage with lagged short-term debt. Then, we use the predicted leverage in our regressions for short-term debt.

In addition to firm-level controls, we employ a number of country-level variables in our regressions. We rely on the set of control variables used by Demircuc-Kunt and Maksimovic (1999) and Fan et al. (2012), who study the cross-country determinants of debt maturity. The first country-level control variable is GDP growth (*gdp_growth*), which aims to capture the differences across countries' economic development levels. The second control variable is the inflation rate (*inflation*), which aims to proxy for lender's willingness to provide long-term financing to firms. Since most debt contracts are nominal, high inflation rates and uncertainty about the general price levels within a country deter lenders from providing long-term loans to firms (Fan et al., 2012). The third control variable is the share of the banking industry in the overall economy (*deposits*). The size of the banking sector is likely to capture the supply of funds available to firms, hence may proxy for the banks' willingness to provide long-term loans to firms. Hence, we expect a negative relationship between *deposits* and short-term debt.

The fourth country-level control variable is the size of the private bond market as a share of GDP (*bonds*). A large, active and liquid bond market within a country may indicate ease of issuing long-term bonds and accessing long-term financing. Thus, we expect private bond market size to be negatively associated with the prevalence of short-term debt. The fifth and sixth variables are the total value of the listed firms in a country's major stock exchange, normalized by its GDP (*stock_market_cap*) and the overall trading volume of the stock exchange over a year, normalized by its mid-year market cap of the same year (*stock_market_turnover*). The size and liquidity levels of stock markets may indicate the availability of external long-term funds to firms. Thus, similar to the effect of *bonds* on debt maturity, we expect these variables to be positively associated with

⁷ Refer to Rajan and Zingales (1995), Datta et al. (2005) and Fan, Titman, and Twite (2012) for a detailed discussion of these control variables.

long-term financing and negatively with short-term debt. The variable construction procedures that are discussed in this section are available in Table A3 of the Appendix.

We should also note that some of the variables control for the factors that affect firms' demand for short-term debt. These variables aim to capture the factors that lead shareholders, managers or directors to prefer short-term financing over the alternative methods of financing. However, as documented by Custodio, Ferreira and Laureano (2013), supply-side factors are also important drivers of the equilibrium debt maturity levels. *deposits*, *bonds*, *stock_market_cap* and *stock_market_turnover* are the variables that are likely to capture the supply-side factors driving the availability of capital to firms.

The descriptive statistics of the variables are shown in Table 2. To limit the effect of outliers on our results, we winsorize all variables, except for the governance variables, at their 1st and 99th percentiles. As Panel A shows, the share of short-term debt in overall debt has a mean value of 32.1% for our sample firms. This figure is lower than the one reported in Fan et al.'s (2012) sample, which is 47%. While it is useful to compare the distribution of this key variable with prior findings, we should also note that our sample differs from theirs in a number of dimensions, including sample period as well as the coverage of firms and their countries.

Table 2. Descriptive Statistics

This table presents the various descriptive statistics of variables used. These are the number of observations, mean values, standard deviations, minimums, maximums, 25th percentiles, medians, and 75th percentile values. The definitions of the variables are in the Appendix. We winsorize all variables at the 1% level except the governance variables. We use one-year lagged values of firm and country-level control variables.

Panel A. Dependent variables	Obs.	Mean	Std. Dev.	Min.	25th perc.	Median	75th perc.	Max.
<i>std</i>	28,591	0.321	0.322	0.000	0.045	0.208	0.518	1.000
<i>leverage</i>	33,034	0.225	0.225	0.000	0.035	0.178	0.338	1.144
Panel B. Governance variables								
<i>gov44</i>	40,019	0.607	0.094	0.297	0.538	0.605	0.674	0.953
<i>gov_board</i>	40,019	0.55	0.126	0.150	0.450	0.545	0.640	0.917
<i>gov_indep</i>	40,019	0.645	0.276	0	0.429	0.750	0.875	1
<i>size_eff</i>	39,962	2.145	0.692	1	2	2	3	3
<i>ceo_chair</i>	35,504	2.125	0.921	1	1	2	3	3
Panel C. Firm-level controls								
<i>size</i>	33,604	6.430	2.418	0.722	4.804	6.541	8.022	12.299
<i>asset_tangibility</i>	32,690	0.225	0.228	0.000	0.037	0.147	0.343	0.884
<i>asset_turnover</i>	32,066	0.916	0.783	0.000	0.327	0.772	1.263	3.898
<i>roa</i>	32,775	-0.046	0.296	-1.902	-0.010	0.022	0.062	0.298
<i>mb</i>	32,684	1.968	1.730	0.654	1.081	1.374	2.097	12.187
Panel D. Country-level controls								

<i>gdp_growth</i>	115	2.081	1.523	-0.188	1.192	1.832	2.846	5.542
<i>inflation</i>	115	1.940	1.557	-1.617	1.127	2.096	3.147	4.115
<i>deposits</i>	115	111.919	29.242	55.669	89.988	114.566	132.786	156.988
<i>bonds</i>	110	38.521	28.391	3.377	19.518	30.017	48.117	109.896
<i>stock_market_cap</i>	113	86.145	47.252	37.917	47.348	74.083	110.685	204.916
<i>stock_market_turnover</i>	115	72.685	39.067	12.040	40.853	74.934	102.785	165.470
Panel E. Other variables								
<i>investor</i>	115	6.374	1.880	3	5	6	8	10
<i>common law</i>	115	0.348	0.478	0	0	0	1	1
<i>gov38</i>	40,019	0.6	0.114	0.235	0.516	0.595	0.684	0.946
<i>nom_comm</i>	40,019	3.409	1.757	1	1	4	5	5
<i>comp_comm</i>	40,019	4.073	1.438	1	4	5	5	5
<i>audit_comm</i>	40,019	4.44	1.047	1	4	5	5	5

Panel B of Table 2 provides information on the distribution of governance variables. *gov44* attains a minimum value of 29.7% and a maximum value of 95.3%. The mean value of this variable in our sample is 60.7%, meaning that an average firm satisfies 60% of the minimal governance attributes that are listed in Table A1. The distribution of the *gov_board* variable is more dispersed, with a mean value of 55%. Thus, an average firm satisfies about half of the minimal governance criteria that are related to boards. The *gov_indep* index variable has a mean value of 0.645. With respect to board size (*size_eff*), our sample firms have, on average, slightly smaller or larger board sizes compared to the optimum size of 9-12 members. Finally, the mean value for the *ceo_chair* variable is 2.12, meaning that the CEO and Chairman positions are not separated for our sample firms on average.

Panel C of Table 2 shows a summary of the firm-level control variables. The average asset tangibility and asset turnover figures in our sample are 22.5% and 91.6%, respectively. The mean value of return on assets (-4.6%) is significantly lower than its median value (2.2%), which is driven by the fact that *roa* has a negatively skewed distribution with large negative values. The distribution of the market-to-book ratio is positively skewed with mean and median values of 1.968 and 1.374, respectively.

Panel D provides information for the country-level control variables. The average GDP growth rate for our sample countries is 2.8% which is consistent with the historical economic growth patterns. The slowest growing country during our sample period is Portugal in 2004 (-1.3%) whose economy had shown a volatile trend between 2003 and 2007. The fastest growing country during the sample period is Singapore in 2005 (8.18%). *inflation* has a mean value of 1.94% during our sample period, while *deposits*, which shows the share of banking firm assets in

a country's GDP, has a mean value of 111%. The countries with the largest banking share are Denmark in 2007 (178.5%), Hong Kong SAR, China, in 2003 (166%) and Switzerland in 2007 (158%), some of which also appear in Demirguc-Kunt and Maksimovic's (1999) rankings. The size of the private bond market (*bonds*) shows a large variation between the minimum value of 3.37% and a maximum value of 109.9%. The largest and the smallest values belong to Denmark in 2005 (152.9%) and Greece in 2003 (0.24%), respectively. The stock market size and trading volume variables also have quite dispersed distributions. The mean (standard deviation) values of the *stock_market_cap* and *stock_market_turnover* variables are 86.1% (47.2%) and 72.6% (39%), respectively.

3. Empirical Results

This section presents the empirical methodology and results. We begin with examining the baseline relationship between governance and short-term debt. Then, we show that the relation between short-term debt and governance depends on the institutional environment of the countries. We instrument investor protection with a common law dummy and utilize 2SLS regressions for our empirical analysis. Finally, we rerun the same regressions with alternative governance variables.

3.1. Baseline Relationship between Governance and Maturity

We begin by examining the relation between short-term debt and measures of governance by running the following regression specification:

$$std_{ijk} = \beta_0 + \beta_1 \times gov_{it} + \Omega \times controls_{i,t-1} + \alpha_j + \lambda_t + \theta_k + \varepsilon_{ijk} \quad (1)$$

where, std_{ijk} is firm i 's short-term debt in year t . Country index and industry index are represented by j and k , respectively. Firm-level control variables are *size*, *asset_tangibility*, *asset_turnover*, *roa* and *mb* and country-level controls are *gdp_growth*, *inflation*, *deposits*, *bonds*, *stock_market_cap*, *stock_market_turnover*. They are lagged by one year to reduce potential endogeneity concerns. *gov* represents the various governance and board measures we use in the analyses. In total, we use five different firm level governance and board measures, which are explained in the previous section. We include country, year and industry fixed effects to control for global macro factors that may affect all firms and time invariant heterogeneity across industries. α_j , λ_t and θ_k are for country, year and industry fixed effects, respectively.

Table 3 presents the results of the regression specified in (1) above. Each column corresponds to results using the governance variable specified in the top part of the table. The main finding from the table is that the coefficients of all governance variables are negative and statistically significant at the 1% level, meaning that short-term debt and firm level governance are substitutes. Controlling for the firm- and country-level factors that may drive short-term debt, the results indicate that better governed firms tend to favor long-term financing over short-term debt. The magnitudes of the coefficients indicate that the marginal effect of governance on debt maturity

is economically significant as well. For instance, in column (1), a 10-percentage point increase in *gov44* leads to a 10.7 percentage point decrease in the share of short-term debt in overall debt. The marginal effect of *gov_board*, which uses board attributes only, is also economically large at 8.3 percentage points for the same 10-percentage point increase.

Table 3. Effect of Governance on Short-Term Debt

This table presents the estimates of the following regression.

$$std_{ijk} = \beta_0 + \beta_1 x gov_{it} + \Omega x controls_{i,t-1} + \alpha_j + \lambda_t + \theta_k + \varepsilon_{ijk}$$

The dependent variable is short-term debt. Leverage is instrumented by lagged short-term debt and the predicted value of leverage is used in the regression. The first step of this 2SLS model is reported in Table A4 of the Appendix. Each column reports the results for a different governance measure. The definitions of the variables are in Appendix. We winsorize all variables at the 1% level except the governance variables. We use one-year lagged values of firm and country-level control variables. All specifications include country, year and industry fixed effects. The z-values from 2SLS approach are reported in the parenthesis. Robust standard errors are estimated by clustering at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: <i>std</i>				
governance measure (gov):	<i>gov44</i>	<i>gov_board</i>	<i>gov_indep</i>	<i>size_eff</i>	<i>ceo_chair</i>
<i>gov</i>	-1.071*** (-6.893)	-0.803*** (-6.836)	-0.441*** (-7.103)	-0.068*** (-4.474)	-0.034*** (-2.794)
<i>leverage</i>	-4.816*** (-17.147)	-4.796*** (-17.221)	-4.778*** (-17.283)	-4.777*** (-17.171)	-4.735*** (-16.313)
<i>size</i>	0.040*** (4.896)	0.043*** (5.175)	0.036*** (4.512)	0.032*** (4.013)	0.020*** (2.622)
<i>asset_tangibility</i>	0.453*** (5.170)	0.449*** (5.145)	0.443*** (5.099)	0.453*** (5.186)	0.403*** (4.494)
<i>asset_turnover</i>	0.015 (0.758)	0.016 (0.785)	0.012 (0.593)	0.013 (0.662)	0.017 (0.815)
<i>roa</i>	-1.184*** (-13.367)	-1.179*** (-13.402)	-1.174*** (-13.394)	-1.178*** (-13.390)	-1.145*** (-12.684)
<i>mb</i>	0.034*** (2.989)	0.033*** (2.891)	0.031*** (2.765)	0.030*** (2.681)	0.027** (2.345)
<i>gdp_growth</i>	0.005 (0.639)	0.009 (1.114)	0.010 (1.177)	0.008 (0.967)	0.010 (1.148)
<i>inflation</i>	0.029** (2.387)	0.034*** (2.787)	0.035*** (2.933)	0.035*** (2.916)	0.001 (0.104)
<i>deposits</i>	0.005*** (2.818)	0.005*** (2.905)	0.005*** (3.140)	0.005*** (3.025)	0.005*** (3.224)
<i>bonds</i>	-0.002 (-1.019)	-0.002 (-0.766)	-0.001 (-0.746)	-0.001 (-0.459)	-0.002 (-1.064)
<i>stock_market_cap</i>	-0.004*** (-4.500)	-0.004*** (-4.168)	-0.005*** (-5.103)	-0.003*** (-3.184)	0.001 (0.760)
<i>stock_market_turnover</i>	-0.000 (-0.529)	-0.000 (-0.640)	-0.001 (-1.168)	-0.000 (-0.822)	0.000 (0.688)
Constant	2.605*** (7.846)	2.233*** (7.267)	2.288*** (7.428)	1.770*** (6.106)	1.311*** (4.117)

Observations	24,409	24,409	24,409	24,388	21,715
R-squared	-7.395	-7.329	-7.272	-7.308	-7.349
Industry, Country and Year FE	Yes	Yes	Yes	Yes	Yes

Board independence is a key variable that is frequently used to assess the governance quality and effectiveness of the boards. For instance, Senbet and Tosun (2019) show that the Sarbanes-Oxley Act of 2002 leads to a sharp increase in the percent of independent directors on the boards of non-compliant firms, and these firms have slashed their short-term debt by about 21% after the regulation. In our estimations, the coefficient of *gov_indep* is -0.441 in column (3), suggesting that a 10 percentage point increase in independence leads to a 4.4 percentage point drop in short-term debt. While our measure for independence differs from theirs, and it is hard to make a one-to-one comparison between the two estimates, the common finding in our study and theirs is that board/governance independence has an economically large impact on the use of short-term debt.

Column (4) in Table 3 displays the marginal effect of board size on debt maturity. As we noted above, boards that are too large or too small may be subject to several problems that can adversely affect their governance functionalities. Our estimates show that a one unit increase in *size_eff* leads to a 6.8 percentage point decrease in short-term debt. For instance, moving from a score of two to a score of three (from a slightly small or large board to an optimum size) leads to lower short-term debt levels.

The final column in Table 3 (column 5) shows the effect of CEO-Chairman dual position on debt maturity. In terms of governance, separation of the two positions is a positive attribute as the firm will go through checks and balances while making important business decisions. Our estimates indicate that higher values of *ceo_chair* variable is associated with lower use of short-term debt. Since *ceo_chair* takes discrete values between one and three, its coefficient (-0.034) implies that a one unit increase in this variable leads to a 3.4 percentage points decrease in the share of short-term debt in total debt. The effect is linear, hence, going from the minimum value to the maximum value leads to a decrease of 6.8 percentage points.

Among the firm-level control variables, we find that *size*, *asset_tangibility* and *mb* have positive and statistically significant coefficients while *roa* attains a negative coefficient. The negative and significant coefficient on *roa* is consistent with Rajan and Zingales (1995) and the

positive coefficient of *mb* is consistent with the conjecture that high growth firms may alleviate agency costs by holding more short-term debt. Leverage has a negative and significant coefficient. As we expect, high leverage firms use less short-term debt in their capital structure. Lastly, the positive coefficients of *size* and *asset_tangibility* does not seem to be consistent with the theoretical predictions.

A number of the country-level control variables attain statistically significant coefficients. As expected, higher inflation leads to uncertainty about the long-term outlook of the economy and firms and leads lenders to hold back their long-term financing. The marginal effect of *inflation* on short-term debt is thus positive. Also, *stock_market_cap*, one of our proxies for the supply of long-term capital available to firms, attains a statistically significant coefficient in all regressions, except for the one in column (5). This result is also consistent with the theoretical predictions. The other capital supply proxies (*bonds* and *stock_market_turnover*) have negative coefficients, though they are not statistically different from zero. Interestingly, *deposits* has a statistically significant and positive coefficient, which is contrary to the theoretical predictions. Perhaps, deposits are not eventually transferred to firms by banks in the form of long-term loans.

As mentioned above, we follow Senbet and Tosun (2019) and use a simultaneous equations model to address the joint determination of leverage and debt maturity. In the first step of this procedure, we predict leverage using the same set of controls that we use for short-term debt plus lagged *std*. In the second step, we use the predicted value of leverage that we obtain from the first stage. The results in Table 3 show the regression output of the second stage regressions. For reference, we show in Table A4 in the Appendix the results of the first stage regressions. In these regressions, all governance variables indicate a negative relation between leverage and firm level governance.

3.2. Effect of Institutional Environment on Short-Term Debt and Governance Relation

The previous results suggest that there is a substitute relationship between short-term debt and governance. Cross-country differences can play an important role in determining this relationship. In this section, we examine whether differences in investor protection rights across countries can affect the role of governance on debt maturity. In particular, we test the hypotheses that the strength of investor protection is important in determining the relationship between governance characteristics and short-term debt.

Our candidate for the institutional variable is investor protection. This variable measures the protection of minority shareholders against the expropriation by the controlling shareholders. We expect that firms with better governance need not choose short-term debt over long-term debt in high investor protection countries. A better governed firm's board does not need to impose external costly monitoring by creditors since the shareholders are already protected by the institutional environment and better internal governance can directly substitute for costlier external monitoring by the creditors. To test this hypothesis, we run the following regression:

$$std_{ijk} = \beta_0 + \Omega \times controls_{i,t-1} + \beta_1 \times gov_{it} + \beta_2 \times gov_{it} \times investor_{jt} + \alpha_j + \lambda_t + \theta_k + \varepsilon_{ijk} \quad (2)$$

The variable of interest is the interaction term (β_2) on governance and investor protection. If the substitution hypothesis is correct, we expect the interaction term to have a negative and statistically significant coefficient. In other words, when the minority investors already have extensive rights and protection in a country, an incremental increase in governance quality of the firms in that country would lead to a greater decrease in their short-term debt compared to the firms of low investment protection countries that experience similar improvements in governance quality.

The regression results are shown in Table 4. As before, each column corresponds to a different governance variable specified at the top of the table. Consistent with the substitution hypothesis, we find that the interaction of governance and investor protection variables, except for *ceo_chair*, are negative and statistically significant. *investor* is a discrete variable with a range of zero to 10, thus a one unit increase in investor protection score diminishes the marginal effect of *gov44* on short-term debt by 19.2 percentage points. The decrease in the marginal effects of *gov_board*, *gov_indep* and *size_eff* on short-term debt, due to a unit increase in investor protection score are 20.5 percentage points, 8.5 percentage points and 2.6 percentage points, respectively. Hence, the interaction terms between governance measures and investor protection are both statistically and economically significant.

Table 4. Investor Protection and the Effect of Governance on Short-Term Debt

This table presents the estimates of the following regression.

$$std_{ijk} = \beta_0 + \beta_1 x gov_{it} + \beta_3 x gov_{it} x investor_{jt} + \beta_2 x investor_{jt} + \Omega x controls_{i,t-1} + \alpha_j + \lambda_t + \theta_k + \varepsilon_{ijk}.$$

The dependent variable is short-term debt and leverage is instrumented by lagged short-term debt. Each column reports the results for a different governance measure. The definition of the variables is in Appendix. We winsorize all variables at the 1% level except the governance variables. We use one-year lagged values of firm and country-level control variables. All specifications include country, year and industry fixed effects. The z-values from 2SLS approach are reported in parenthesis. Robust standard errors are estimated by clustering at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: <i>std</i>				
governance measure (gov):	<i>gov44</i>	<i>gov_board</i>	<i>gov_indep</i>	<i>size_eff</i>	<i>ceo_chair</i>
<i>gov</i>	0.424 (0.662)	0.798 (1.461)	0.208 (0.910)	0.133 (1.541)	-0.074 (-0.950)
<i>gov x investor</i>	-0.192** (-2.200)	-0.205*** (-2.792)	-0.085*** (-2.621)	-0.026** (-2.265)	0.005 (0.506)
<i>investor</i>	0.107** (1.969)	0.105** (2.282)	0.043 (1.418)	0.073* (1.909)	-0.061 (-1.385)
<i>leverage</i>	-4.820*** (-17.136)	-4.798*** (-17.220)	-4.778*** (-17.292)	-4.763*** (-17.197)	-4.737*** (-16.309)
<i>size</i>	0.041*** (4.929)	0.044*** (5.228)	0.036*** (4.578)	0.032*** (4.082)	0.020*** (2.621)
<i>asset_tangibility</i>	0.454*** (5.178)	0.450*** (5.158)	0.443*** (5.096)	0.453*** (5.199)	0.403*** (4.492)
<i>asset_turnover</i>	0.015 (0.746)	0.015 (0.766)	0.012 (0.586)	0.013 (0.665)	0.016 (0.810)
<i>roa</i>	-1.185*** (-13.360)	-1.179*** (-13.398)	-1.173*** (-13.394)	-1.174*** (-13.391)	-1.145*** (-12.681)
<i>mb</i>	0.034*** (2.980)	0.032*** (2.870)	0.031*** (2.747)	0.030*** (2.664)	0.027** (2.348)
<i>gdp_growth</i>	0.002 (0.193)	0.004 (0.536)	0.004 (0.509)	0.009 (1.031)	0.010 (1.160)
<i>inflation</i>	0.036*** (2.842)	0.040*** (3.172)	0.039*** (3.146)	0.035*** (2.903)	-0.003 (-0.205)
<i>deposits</i>	0.005*** (3.072)	0.005*** (3.073)	0.005*** (3.227)	0.005*** (2.956)	0.005*** (3.275)
<i>bonds</i>	-0.002 (-0.876)	-0.002 (-0.728)	-0.002 (-0.873)	-0.001 (-0.345)	-0.002 (-1.187)
<i>stock_market_cap</i>	-0.004*** (-4.170)	-0.003*** (-3.845)	-0.004*** (-4.675)	-0.003*** (-3.286)	0.001 (1.223)
<i>stock_market_turnover</i>	-0.000 (-0.112)	-0.000 (-0.443)	-0.000 (-0.738)	-0.001 (-0.939)	0.000 (0.785)
Constant	1.627*** (3.008)	1.328*** (2.835)	1.892*** (4.834)	1.207*** (2.802)	1.767*** (3.537)
Observations	24,409	24,409	24,409	24,388	21,715
R-squared	-7.407	-7.333	-7.269	-7.260	-7.354
Industry, Country and Year FE	Yes	Yes	Yes	Yes	Yes

The coefficients of the control variables in Table 4 are consistent with those reported in Table 3. In particular, *size*, *asset_tangibility*, *mb*, *inflation* and *deposits* have statistically significant and positive coefficients while *leverage*, *roa* and *stock_market_cap* have statistically significant and negative coefficients.

3.3. Instrumenting Institutional Environment with Legal Origin

La Porta et al. (1998) and Djankov et al. (2008) show that common law countries tend to have better creditor rights and investor protection. We use legal origin as proxy for institutional environment and interact the dummy variable, *common law*, with the governance measures. We run 2SLS regressions where we instrument the interaction term *gov x investor* with *common law x investor*. Our conjecture is that there is a positive correlation between *common law* indicator and investor protection, yet there is no direct relation between *common law* and short-term debt, after controlling for the effect of investor protection and other variables.

We present the results for investor protection in Table 5. Our results are similar to those presented in Table 4. The coefficients of the interaction terms, except for *ceo_chair* are all negative, meaning that good governance lowers short-term more when the legal system is sound and provides protection for minority shareholders. The coefficient of the *gov44* variable is negative as well but it does not attain statistical significance at conventional significance levels. For the leverage regressions (not shown), the interaction terms have negative signs as well. In general, our instrumental variable approach strengthens our conclusion that short-term debt and governance act as substitutes when the investor protection is greater.

Table 5. Instrumental Variable Estimation of Investor Protection and the Effect of Governance on Short-Term Debt

This table presents the estimates of the following regression.

$$std_{ijk} = \beta_0 + \beta_1 x gov_{it} + \beta_3 x gov_{it} x investor_{jt} + \beta_2 x investor_{jt} + \Omega x controls_{i,t-1} + \alpha_j + \lambda_t + \theta_k + \varepsilon_{ijk}.$$

We use two-stage least square (2SLS) approach to instrument $investor_{jt}$ by common law dummy variable which is equal to 1 if the country has a common law and 0 otherwise. The dependent variable is short-term debt and leverage is instrumented by lagged short-term debt. Each column reports the results for a different governance measure. The definition of the variables is in the Appendix. We winsorize all variables at the 1% level except the governance variables. We use one-year lagged values of firm and country-level control variables. All specifications include country, year and industry fixed effects. z-values from 2SLS approach are reported in the parenthesis. Robust standard errors are estimated by clustering at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Dependent variable: <i>std</i>					
governance measure (gov):	<i>gov44</i>	<i>gov_board</i>	<i>gov_indep</i>	<i>size_eff</i>	<i>ceo_chair</i>
<i>gov</i>	0.294 (0.336)	0.958 (1.302)	0.544* (1.681)	0.446*** (3.303)	-0.106 (-1.245)
<i>gov x investor</i>	-0.175 (-1.501)	-0.226** (-2.310)	-0.128*** (-2.884)	-0.067*** (-3.741)	0.009 (0.829)
<i>investor</i>	0.071 (0.930)	0.088 (1.416)	0.036 (0.854)	0.124** (2.370)	-0.147*** (-2.691)
<i>leverage</i>	-4.820*** (-17.134)	-4.799*** (-17.219)	-4.778*** (-17.296)	-4.742*** (-17.251)	-4.738*** (-16.305)
<i>size</i>	0.041*** (4.926)	0.044*** (5.232)	0.037*** (4.612)	0.033*** (4.183)	0.020*** (2.621)
<i>asset_tangibility</i>	0.454*** (5.173)	0.450*** (5.155)	0.443*** (5.091)	0.452*** (5.213)	0.403*** (4.487)
<i>asset_turnover</i>	0.015 (0.746)	0.015 (0.763)	0.011 (0.581)	0.013 (0.668)	0.016 (0.805)
<i>roa</i>	-1.185*** (-13.359)	-1.179*** (-13.397)	-1.173*** (-13.394)	-1.167*** (-13.400)	-1.145*** (-12.677)
<i>mb</i>	0.034*** (2.982)	0.032*** (2.869)	0.031*** (2.739)	0.030*** (2.639)	0.027** (2.352)
<i>gdp_growth</i>	0.002 (0.205)	0.004 (0.448)	0.001 (0.149)	0.009 (1.069)	0.010 (1.167)
<i>inflation</i>	0.035*** (2.630)	0.039*** (3.073)	0.039*** (3.123)	0.032*** (2.659)	-0.009 (-0.688)
<i>deposits</i>	0.005*** (3.048)	0.005*** (3.104)	0.005*** (3.292)	0.005*** (2.889)	0.005*** (3.329)
<i>bonds</i>	-0.002 (-0.928)	-0.002 (-0.772)	-0.002 (-0.996)	-0.001 (-0.305)	-0.003 (-1.389)
<i>stock_market_cap</i>	-0.004*** (-3.996)	-0.003*** (-3.644)	-0.004*** (-4.300)	-0.003*** (-3.170)	0.002* (1.771)
<i>stock_market_turnover</i>	-0.000 (-0.131)	-0.000 (-0.407)	-0.000 (-0.500)	-0.001 (-1.075)	0.001 (0.948)
Constant	1.929*** (2.692)	1.458** (2.493)	1.922*** (4.213)	0.841* (1.674)	2.408*** (4.463)
Observations	24,409	24,409	24,409	24,388	21,715
R-squared	-7.407	-7.335	-7.270	-7.196	-7.361
Industry, Country and Year FE	Yes	Yes	Yes	Yes	Yes

3.4. Alternative Governance Measures

Our set of governance variables capture a wide variety of governance characteristics, ranging from firms' overall governance scores to whether their CEO and chairman positions are separated. Since the board of directors take active roles in initiating, managing and approving the major financing decisions, extant literature has considered the role of boards in using debt maturity as a tool to manage the agency conflicts between shareholders and managers. As a result, the relationship between governance quality and debt maturity has been mostly investigated using board-related characteristics (Harford et al., 2008; Senbet and Tosun, 2019). While this may be accurate on average, the governance quality of firms may spill over to the other governance related decisions within firms and thus could be measured by non-board governance characteristics as well. In this section, we examine whether alternative governance quality proxies may help predict the variation in short-term debt ratios.

As additional governance measures, we use the independence of compensation, nominating, and audit committees (*comp_comm*, *nom_comm*, and *audit_comm*).⁸ These measures are based on governance attributes “Compensation committee composed solely of independent outsiders” (#7), “Nominating committee composed solely of independent outsiders” (#9), and “Audit committee composed solely of independent outsiders” (#36), respectively. They range from one to five and a higher value indicates a committee with more independent members.

The independence of these committees may reflect firms' general approach for having independent decision makers serving important committees and boards. Since *comp_nomm* and *nom_comm* are both designed to implement proper mechanisms to align top executives' incentives with those of the shareholders', these two variables are also useful for capturing boards' efforts to curb managerial self-interest. On the other hand, a more independent audit committee is likely to be a better monitor of the managerial decisions and thus can serve as an alternative proxy for good governance.

We replicate the regressions in Tables 3 to 5 using these three governance variables and the *gov38* variable that uses the 38 governance attributes listed in Table A1. As noted earlier, *gov38* does not include anti-takeover provisions in the index (attributes 39 to 44) mainly because they

⁸ The Sarbanes-Oxley Act of 2002 requires listed firms to have independent members in the auditing, nominating and compensation committees (Chhaochharia and Grinstein, 2009).

are related to laws and regulations, which are not always directly comparable across countries. Panel A in Table 6 shows that all the four governance variables negatively affect short-term debt share in total debt. *gov38* and *gov44* are highly correlated, hence it is perhaps not surprising to see that the marginal effect of *gov38* resembles that of *gov44*. The marginal effects of the nominating committee variables are similar for the other three variables. A one unit increase in *nom_comm*, *comp_comm* and *audit_comm* scores leads to 6.9, 6.8 and 8.2 percentage points decrease in short-term debt, respectively. Thus, we confirm that the relations between firm-level governance qualities are negatively related to the use of short-term debt, suggesting these two tools are substitutes for each other.

Table 6. Effect of Governance on Short-Term Debt: Alternative Governance Variables

Using alternative governance proxies, this table presents the estimates of the regression models presented in Tables 3, Table 4 and Table 5 in Panels A, B and C, respectively. The dependent variable is short-term debt and leverage is instrumented by lagged short-term debt. Each column reports the results for a different governance measure. The definitions of the variables are in Appendix. To conserve space, we do not report the coefficients of the control variables. We winsorize all variables at the 1% level except the governance variables. We use one-year lagged values of firm and country-level control variables. All specifications include country, year and industry fixed effects. The z-values from 2SLS approach are reported in the parenthesis. Robust standard errors are estimated by clustering at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. Baseline regressions	(1)	(2)	(3)	(4)
Dependent variable: <i>std</i>				
governance measure (gov):	<i>gov38</i>	<i>nom_comm</i>	<i>comp_comm</i>	<i>audit_comm</i>
gov	-1.131*** (-7.903)	-0.069*** (-7.841)	-0.068*** (-5.160)	-0.082*** (-4.962)
Same set of controls in Table 3	Yes	Yes	Yes	Yes
Panel B. The role of investor protection				
gov	0.509 (0.993)	0.071** (2.056)	0.082** (2.151)	0.064 (1.636)
<i>gov x investor</i>	-0.212*** (-2.956)	-0.018*** (-3.760)	-0.020*** (-3.404)	-0.021*** (-3.037)
<i>investor</i>	0.105** (2.319)	0.047* (1.647)	0.069** (2.128)	0.068** (1.992)
Same set of controls in Table 4	Yes	Yes	Yes	Yes
Panel C. Instrumental variable estimation				
gov	0.544 (0.774)	0.079* (1.951)	0.093** (2.006)	0.107** (2.080)
<i>gov x investor</i>	-0.216** (-2.259)	-0.019*** (-3.424)	-0.022*** (-3.061)	-0.028*** (-3.116)
<i>investor</i>	0.089	0.034	0.040	0.054

	(1.418)	(0.966)	(1.005)	(1.181)
Same set of controls in Table 5	Yes	Yes	Yes	Yes

Panel B and Panel C of Table 6 replicate the econometric model shown in Tables 4 and 5, respectively. In Panel B, the interaction between the four governance variables and *investor* are all negative and statistically significant. This confirms our earlier findings that use the baseline governance variables. The instrumental variables estimation of the same regression, whose output is in Panel C confirms that the negative coefficients of the interaction terms are robust to alternative econometric modeling that takes into account endogeneity. Overall, we conclude that there is a negative relationship between governance and the use of short-term debt by firms, and this negative association is robust to the way governance variables are defined.

4. Conclusion

In this paper, we use international corporate governance data and show that the association between short-term debt and governance varies across countries. The firms with good governance do not rely on the external monitoring of the creditors and so they do not incur the costs of short-term debt such as liquidity risk. However, we show that institutional environment plays a key role in determining the association between short-term debt and governance. As there is a trade-off between the benefits of short-term debt in reducing agency problems and its costs associated with liquidity and distress, firms with better governance choose higher amounts of short-term debt when it is more effective. In particular, we find that short-term debt and governance act as substitutes in high investor protection countries because the benefit for costly external monitoring using short-term debt is lower.

To address potential endogeneity concerns, we use legal origin as an instrument for investor protection and find that our results continue to hold. We take an additional step and create a number of alternative governance quality measures and test whether the baseline results are specific to the initial set of governance variables. Our findings indicate that there is a strong negative relation between governance and use of short-term debt under these alternative variable definitions. Overall, the results in this paper emphasize the importance of institutional environment and in particular the legal rights granted to creditors and investors in determining the relationship between corporate governance and debt maturity.

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Appendix

Table A1. Governance attributes

This table presents the Corporate Governance Quotient (CGQ) metrics developed by ISS.

Board attributes

1. All directors attended 75% of board meetings or had a valid excuse
 2. CEO serves on the boards of two or fewer public companies
 3. Board is controlled by more than 50% independent outside directors
 4. Board size is greater than 5 but less than 16
 5. CEO is not listed as having a related-party transaction
 6. No former CEO on the board
 7. Compensation committee composed solely of independent outsiders
 8. Chairman and CEO are separated or there is a lead director
 9. Nominating committee composed solely of independent outsiders
 10. Governance committee exists and met in the past year
 11. Shareholders vote on directors selected to fill vacancies
 12. Governance guidelines are publicly disclosed
 13. Annually elected board (no staggered board)
 14. Policy exists on outside directorships (four or fewer boards is the limit)
 15. Shareholders have cumulative voting rights
 16. Shareholder approval is required to increase/decrease board size
 17. Majority vote requirement to amend charter/bylaws
 18. Board has the express authority to hire its own advisors
 19. Performance of the board is reviewed regularly
 20. Board-approved succession plan in place for the CEO
 21. Outside directors meet without CEO and disclose number of times met
 22. Directors are required to submit resignation upon a change in job
 23. Board cannot amend bylaws without shareholder approval or can do so only under limited circumstances
 24. Does not ignore shareholder proposal
 25. Qualifies for proxy contest defenses combination points
-

Compensation and ownership attributes

26. Directors are subject to stock ownership requirements
 27. Executives are subject to stock ownership guidelines
 28. No interlocks among compensation committee members
 29. Directors receive all or a portion of their fees in stock
 30. All stock-incentive plans adopted with shareholder approval
 31. Options grants align with company performance and reasonable burn rate
 32. Company expenses stock options
 33. All directors with more than one year of service own stock
 34. Officers' and directors' stock ownership is at least 1% but not over 30% of total shares outstanding
 35. Repricing is prohibited
-

Auditing attributes

36. Audit committee composed solely of independent outsiders
 37. Consulting fees paid to auditors are less than audit fees paid to auditors
 38. Auditors ratified at most recent annual meeting
-

Antitakeover attributes

39. Single class, common
 40. Majority vote requirement to approve mergers (not supermajority)
 41. Shareholders may call special meetings
 42. Shareholder may act by written consent
 43. Company either has no poison pill or a pill that was shareholder approved
 44. Company is not authorized to issue blank check preferred
-

Source: Aggarwal et al. (2009)

Table A2. Scoring of governance variables

This table presents the scoring methodology of some of the governance variables that are not used as an index.

<i>size eff</i>	Score
Board size is less than 6 or greater than 15	1
Board size is between 6 and 8 or 13 and 15	2
Board size is between 9 and 12	3
<i>comp comm, nom comm, and audit comm</i>	Score
No committee	1
Full board fulfills function	2
Committee includes insiders	3
Committee includes affiliated outsiders	4
Committee comprised solely of independent outsiders or Committee comprised solely of independent outside directors and board can hire its own advisors	5
<i>ceo chair</i>	
Chairman and CEO are not separated and there is no lead director or Chairman and CEO are combined	1
Chairman and CEO are not separated but there is a lead director or Chairman and CEO are combined, but there is a counterbalancing governance structure in place	2
Chairman and CEO are separated, or Chairman and CEO are separated and Chairman is an independent outsider, or Chairman and CEO are separated and Chairman is an affiliated outsider or Chairman and CEO are separated and Chairman is an insider	3

Table A3. Variable definitions

This table presents brief definitions of the variables and their data sources. We winsorize all variables except the governance variables at the 1 % level. We used one-year lagged values of firm controls.

Variables	Definition	Source
Dependent Variables		
<i>std</i>	The ratio of short-term debt (<i>DLC</i>) to total debt (<i>DLC+DLTT</i>).	COMPUSTAT
<i>leverage</i>	The ratio of total debt (<i>DLC+DLTT</i>) to total assets (<i>AT</i>).	COMPUSTAT
Governance Variables		
<i>gov44</i>	The governance index using all 44 governance attributes available in the ISS database. Higher values indicate better governance.	ISS
<i>gov_board</i>	The governance index using all 25 governance attributes related to board. Higher values indicate better governance.	ISS
<i>gov_indep</i>	Governance index using eight governance attributes related to independence. The index uses #2, #3, #6, #7, #8, #9, #21, and #36 governance attributes. Higher values indicate better governance.	ISS
<i>size_eff</i>	Effective board size score ranging from 1 to 3. Higher values indicate better governance. If the board size is between 9 and 12, it takes a value of 3. If the board size is 6-8 or 13-15, then it takes a value of 2. If the board size is less than 6 or greater than 15, then it takes a value of 1.	ISS
<i>ceo_chair</i>	CEO Chairman separation score ranging from 1 to 3. The score is based on attribute #8. Higher values indicate better governance.	ISS
<i>gov38</i>	The governance index using 38 governance attributes. The excluded ones are anti-takeover attributes. Higher values indicate better governance.	ISS
<i>nom_comm</i>	Nominating committee independence score ranging from 1 to 5. The score is based on attribute #9. Higher values indicate better governance.	ISS
<i>comp_comm</i>	Compensation committee independence score ranging from 1 to 5. The score is based on attribute #7. Higher values indicate better governance.	ISS
<i>audit_comm</i>	Audit committee independence score ranging from 1 to 5. The score is based on attribute #26. Higher values indicate better governance.	ISS
Country Variables		
<i>investor</i>	Measure of minority shareholder protection. It ranges from 0 to 10. Higher values indicate better protection.	World Bank Doing Business Survey
<i>common law</i>	It is a dummy variable that attains a value of 1 if the country's legal origin is common law (US, UK, Australia, New Zealand, Canada, Hong Kong and Ireland and Singapore), and 0 otherwise.	World Bank
<i>gdp_growth</i>	Growth rate of real GDP per capita. GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars.	World Bank national accounts data, OECD National Accounts data
<i>inflation</i>	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.	

<i>deposits</i>	Total assets held by deposit money banks as a share of GDP. Assets include claims on domestic real nonfinancial sector which includes central, state and local governments, nonfinancial public enterprises and private sector. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits.	International Financial Statistics (IFS), International Monetary Fund (IMF) Bank of International Settlements' Quarterly Review:
<i>bonds</i>	Private bond market capitalization as a share of GDP.	International Banking and Financial Market Developments by sector and country of issuer
<i>stock_market_cap</i>	Total stock market capitalization of listed companies as of year-end divided by GDP.	World Federation of Exchanges; Global Stock Markets Factbook and supplemental
<i>stock_market_turnover</i>	Total value of shares traded during a year divided by the average market capitalization for the same year.	S&P data, Standard & Poor's World Bank
Firm Controls		
<i>size</i>	Natural logarithm of total assets (<i>AT</i>) in USD currency.	COMPUSTAT
<i>asset_tangibility</i>	Asset tangibility. The ratio of total property, plant and equipment (<i>PPENT</i>) to total assets (<i>AT</i>).	COMPUSTAT
<i>asset_turnover</i>	Net sales (<i>SALE</i>) divided by total assets (<i>AT</i>).	COMPUSTAT
<i>roa</i>	Profitability. The ratio of net income (<i>NI</i>) to total assets (<i>AT</i>). If net income (<i>NI</i>) is missing, then consolidated net income (<i>NICON</i>) is used.	COMPUSTAT
<i>mb</i>	Market to book ratio. The ratio of market value of equity to book value of equity (<i>CEQ</i>).	COMPUSTAT

Table A4. Effect of Governance on Leverage

This table presents the estimates of the following regression.

$$leverage_{ijk} = \beta_0 + \beta_1 x gov_{it} + \Omega x controls_{i,t-1} + \alpha_j + \lambda_t + \theta_k + \varepsilon_{ijk}$$

The dependent variable is leverage. Each column reports the results for a different governance measure. The definitions of the variables are in Appendix. We winsorize all variables at the 1% level except the governance variables. We use one-year lagged values of firm and country-level control variables. All specifications include country, year and industry fixed effects. The t-values are reported in the parenthesis. Robust standard errors are estimated by clustering at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: <i>leverage</i>				
governance measure (gov):	<i>gov44</i>	<i>gov_board</i>	<i>gov_indep</i>	<i>size_eff</i>	<i>ceo_chair</i>
<i>gov</i>	-0.185*** (-6.414)	-0.141*** (-6.443)	-0.087*** (-7.404)	-0.005* (-1.770)	-0.005** (-2.211)
<i>size</i>	0.021*** (15.472)	0.022*** (15.677)	0.021*** (15.632)	0.019*** (13.842)	0.018*** (13.133)
<i>asset_tangibility</i>	0.191*** (11.439)	0.191*** (11.425)	0.190*** (11.358)	0.192*** (11.423)	0.182*** (10.302)
<i>asset_turnover</i>	0.005 (1.266)	0.005 (1.288)	0.004 (1.065)	0.004 (1.129)	0.004 (1.055)
<i>roa</i>	-0.216*** (-17.424)	-0.216*** (-17.443)	-0.216*** (-17.498)	-0.217*** (-17.476)	-0.211*** (-16.416)
<i>mb</i>	0.001 (0.282)	0.000 (0.175)	0.000 (0.091)	-0.000 (-0.017)	-0.001 (-0.286)
<i>gdp_growth</i>	0.001 (0.681)	0.002 (1.084)	0.002 (1.178)	0.002 (0.992)	0.003 (1.548)
<i>inflation</i>	0.006** (2.176)	0.007** (2.519)	0.007*** (2.728)	0.007*** (2.770)	-0.001 (-0.482)
<i>deposits</i>	0.001 (1.340)	0.001 (1.433)	0.001 (1.552)	0.001 (1.567)	0.001* (1.948)
<i>bonds</i>	-0.000 (-0.508)	-0.000 (-0.336)	-0.000 (-0.375)	-0.000 (-0.218)	-0.000 (-0.619)
<i>stock_market_cap</i>	-0.001*** (-4.423)	-0.001*** (-4.174)	-0.001*** (-5.246)	-0.001*** (-3.503)	0.000 (1.463)
<i>stock_market_turnover</i>	-0.000 (-0.905)	-0.000 (-1.007)	-0.000 (-1.424)	-0.000 (-1.188)	0.000 (1.373)
Constant	0.264*** (4.509)	0.216*** (3.819)	0.208*** (3.699)	0.179*** (3.175)	0.073 (1.220)
Observations	29,597	29,597	29,597	29,575	26,451
R-squared	0.193	0.193	0.193	0.190	0.188
Industry, Country and Year FE	Yes	Yes	Yes	Yes	Yes