THREE ESSAYS ON COLLATERAL AND CAPITAL STRUCTURE: INTERNATIONAL EVIDENCE

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Abstract: This dissertation comprises with three chapters. In first chapter, I investigate a novel feature of collateral: its role as a commitment device that induces a speedier adjustment of leverage to the optimal ratio. As a manifestation of commitment, firms increase the speed of adjustment of book leverage ratio (to the optimal) by 3.0% if they possess higher tangible assets. This commitment value of tangible assets is more important if the adjustment is expensive, and the monitoring from creditors is costly. I find that firms with higher tangible assets adjust leverage more speedily than those with lower tangible assets even if they are over-levered, headquartered in weak creditor rights countries, or both. Further, firms with financial flexibility (spare debt capacity) and higher tangible assets invest more by issuing new debt. In the second chapter, I document that social trust is an important country-level factor of capital structure choice using firm-level data from 32 countries (excluding the U.S.), Specifically, higher social trust is associated positively with long-term debt ratio. The findings are robust when I control for other important country-level and firm-level factors. In particular, the association becomes stronger when governance quality, creditors' rights, and financial development of a country are weak. I also analyze firm-level factors such as tangible assets, profitability, growth opportunity, and financial distress, with their interaction effect on leverage ratio. Factors that hinder (ease) the use of external financing produce a stronger (weaker) association between social trust and the long-term debt ratio. Existing studies of the capital structure show a positive association between tangible assets and leverage, but studies have ignored the potential variation in magnitude due to the institutional heterogeneity across countries. In chapter three, I find that the association between tangible assets and leverage is weaker if firms are located in countries with stronger creditors' rights, better financial development, good governance, and more transparent countries. The robustness tests of the association between asset tangibility and leverage reveal that the association is stronger during a crisis period. However, this crisis-period association becomes less positive if firms headquartered in stronger institutional environments, i.e., stronger creditors rights, better financial development, good governance, and high country-level transparency.

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CHAPTER I

COLLATERAL, COMMITMENT, AND CAPITAL STRUCTURE: INTERNATIONAL EVIDENCE

Introduction

Most theoretical and empirical studies of capital structure have unequivocally recognized tangible assets or collateral as one of the first-order determinants of capital structure (Frank & Goyal, 2009; Guedes & Opler, 1996; Oztekin, 2015; Rajan & Zingales, 1995; Titman & Wessels, 1988).[1] The tangible nature and ease of access in default (Liberti & Sturgess, 2018) make tangible assets particularly valuable to creditors which in turn affects issuers' capital structure choice as they trade-off the benefits of debt against equity. More recently, in his 2019 presidential address to the American Finance Association DeMarzo (2019) has suggested another role for tangible assets—its implication as a natural commitment device. In an agency theory framework, the conflict between shareholders and debtholders and the consequent transfer of wealth implications magnify when firms deviate far away from the target leverage ratio (Jensen and Meckling, 1976). In this context, commitment to the lenders implies that firms will not deviate from the target capital structure

[1] The term collateral refers to assets that lenders accept as security for a loan. Both tangible and intangible assets can be used as collateral. Tangible assets are assets that have finite monetary values and physical forms. I use tangible assets and collateral interchangeably, as most of the countries in this study use tangible assets as effective collateral, e.g., India, France. Some countries even pass legislation to use movable tangible assets as collateral, e.g., Chile, Czech Republic, Hong Kong, Hungary, India, Malaysia, Pakistan, Romania, Singapore, Slovakia, Srilanka, Turkey. In the US, 63% of the medium and small enterprise loans are collateralized with movable tangible assets.

significantly.[2] To the extent tangible assets serve as an effective commitment mechanism, an interesting empirical question, which I examine in this paper, is whether tangible assets are associated with a faster capital structure adjustment process towards the target.

DeMarzo (2019) considers commitment as the primary determinant of capital structure, and collateral is an essential commitment mechanism. The static trade-off theory suggests that firms would rely almost entirely on debt for exploiting tax advantages when they can commit to fully repaying the loans. But without commitment, the Modigliani and Miller (1958) irrelevance theory will hold because lenders can anticipate the risk and adjust the cost of debt, which eventually eliminates the cost advantages of debt financing. Firms that are unable to commit to their future capital structure choices cannot benefit current shareholders by taking more leverage. Thus, to capture the potential tax advantage of debt financing, firms need to commit *ex-ante* to constrain future capital choices. However, this *ex-ante* constraint may make the *ex-post* capital structure choice inefficient as well as path-dependent. As a result, collateral endogenously appears as a pertinent factor of capital structure choice.

DeMarzo (2019) further argues that firms readjust leverage back to the *ex-ante* optimal level as a demonstration of higher commitment. The commitment to reduce the leverage, if firms are over-levered, mitigates the anticipated default cost and further ensures a lower cost of debt upfront. Thus, firms adjust the leverage ratio back to its value-maximizing level. On the other hand, firms would always choose to issue debt, no matter how excessive the leverage would be, in the state of absent commitment. This is a manifestation of the leverage rachet effect noted by Admati et al. (2018).[3] Anticipating firms' value-destroying risky attitude, lenders adjust the cost of

[2] Graham and Harvey's (2001) seminal survey finds that firms have target capital ratios and adjust their capital ratios by issuing debt or equity.

[3] According to the leverage rachet effect, once a firm becomes over-levered, shareholders do not gain from the leverage adjustment instead prefer to increase the borrowings even if the issuing of the debt destroys the firm value.

financing that may offset the advantages of debt. Consistent with this viewpoint, I argue that tangible assets increase the *ex-ante* commitment, which leads firms to adjust the leverage ratio dynamically towards the target. To test the proposition of the commitment nature of the collateral, I apply the dynamic capital structure framework.

Specifically, this paper addresses the following question: how does the commitment value of collateral affect capital structure dynamics (i.e., speed of adjustment, SOA)? While much of the capital structure literature is done in a static setting, there has been considerable interest in capital structure choice in a dynamic context (Flannery & Rangan, 2006; Oztekin & Flannery, 2012; Oztekin, 2015). Practically, the choice of financing is not static but dynamic (DeMarzo, 2019; Fischer, Heinkel, & Zechner, 1989). Several recent empirical studies focus on dynamic aspects of capital structure choice with an emphasis on deviations from target capital structure and the factors that affect the relative speed of adjustment of leverage (Cook & Tang, 2010; Devos, Rahman, and Tsang, 2017; Faulkender et al., 2012; Oztekin & Flannery, 2012; Rahman, 2019; among others). This study focuses on examining the role of tangible assets in the SOA of leverage using a global sample of firms from 32 different countries covering the period from 1990 through 2018. The use of an international sample allows to test the universality of the commitment nature of tangible assets across countries and provides for rich insight into the role of commitment and possible interplay with institutional differences across varied countries.

Following the capital structure SOA methodology used in the existing literature, I regress deviation between target leverage ratio and lag actual leverage ratio on the change of leverage ratio (Flannery & Rangan, 2006; Oztekin & Flannery 2012; Oztekin, 2015, and many others). Then, I include the interaction effect between tangible assets and deviation in the model to find the marginal effect of tangible assets in the SOA. I find consistent results with the hypothesis: higher tangible assets increase the adjustment speed of firms' book leverage ratio by 3.0%, approximately 15.0%

of the total adjustment speed of 20.1%. The result is both economically and statistically significant at 1% level.[4] In addition to the main hypothesis, I examine several others. The second hypothesis argues that commitment is especially salient when firms are over-levered and subject to significant adjustment costs.[5] Previous literature finds a higher adjustment cost for over-levered firms (Byoun, 2008) for several reasons. First, they are less financially flexible due to the higher financing cost. Second, de-levering with internal financing sources may be more expensive as firms can lose the opportunity to invest in future positive NPV projects. Consequently, over-levered firms opt to remain over-levered.[6] In this context, commitment from firms to lenders becomes more valuable. Therefore, tangible assets' commitment value should be higher for over-levered firms.

Consistent with the hypothesis, I find that over-levered firms enhance their SOA of leverage if firms are highly committed. Over-levered firms with high tangible assets adjust their book (market) leverage ratio by 7.2% (4.3%) speedier than those with low tangible assets. Furthermore, I test more severe tests of commitment when firms are over-levered and they have deficit financing or experience declining profitability.[7] The previous study of Byoun (2008) finds that over-levered firms enhance the SOA of the leverage ratio towards the target if firms have surplus cash. I supplement these findings by showing that firms adjust leverage even if they have deficit financing to maintain the initial commitment. The results show that over-levered and deficit

[4] The book leverage ratio is long term debt plus short term debt scaled by total assets. Market leverage is long term debt plus short term debt scaled by long term debt plus short term debt plus market value of firm's equity.

[5] Firms are over-levered if the firm's leverage ratio is above the target leverage ratio. Following existing literature (Faulkender et al., 2012), I estimate the target leverage ratio using the 2-stage system GMM.

[6] As DeMarzo (2019) argues that over-levered firms even increase the leverage ratio at the expense of the shareholders' value when the firms lack the commitment.

[7] Deficit financing refers to the inadequacy of internal cash flows for real investment and dividend commitments. Following Frank and Goyal (2009), I calculate deficit financing as the net negative cashflow after adjusting for the investment, dividend, and net working capital needs. $Deficit\ Financing = (Dividend + Investment + \Delta WC - Internal\ CF)/Total\ Assets$. I define declining profitability if the firm's EBIT declines from the previous year for consecutive previous three years to capture the sudden shock in the profitability of the firm.

financing firms with relatively more tangible assets have a 6.7% higher SOA of book leverage than similar firms with lower tangible assets. This is consistent with tangible assets serving as a commitment mechanism. Next, I examine the role of commitment nature of tangible assets during the period of declining profitability. Extant studies find a negative association between profitability and leverage ratio, perhaps due to profitable firms' passive profits accumulation. However, during declining profitability periods, firms incur higher leverage adjustment costs to fulfill the commitment as they become more constrained to use internal sources to reduce leverage towards the optimal level. Thus, I analyze whether firms with higher tangible assets increase the adjustment speed of leverage towards the target from the over-levered position if they experience declining profitability in the previous three consecutive years. The result suggests that firms with declining profitability increase the book leverage ratio's adjustment speed if they have more tangible assets than ones with lower tangible assets.

Delving further into the role of tangible assets on the speed of leverage adjustment, given the international nature of the dataset, I examine the commitment aspect of tangible assets considering institutional heterogeneity across countries. Differences in creditor rights matter in loan contracting because the law determines who controls the insolvency process and who possesses the right of assets during bankruptcy (Bae & Goyal, 2009). Stronger creditor rights delegates more authority to lenders in exercising control over firms and collateral in case firms fail to conform to their commitment. Consequently, firms in higher creditor rights countries have less flexibility to deviate from the target ratio (Oztekin, 2015). On the other hand, covenant violations and deviation from the target leverage ratio may be expected for firms located in low creditor rights countries (Daher, 2017). In this situation, commitment to lenders plays a prominent role if firms are located in a weak creditor rights environment. Consistent with Rajan and Zingales (1995), I argue that having stronger creditor rights increases the monitoring of the creditors. Thus, firms' commitment

to creditors may be redundant. On the other hand, the role of the commitment of tangible assets comes into play when the monitoring and enforceability from lenders are low. Hence, I hypothesize that firms with high tangible assets located in weaker creditor rights environments display a higher commitment to lenders keeping leverage closer to the optimal ratio.

To test the hypothesis, I construct two subsamples: weak creditor rights countries and strong creditor rights countries. Weak creditor rights countries are those with creditor rights indices of 0, 1, or 2.[8] After constructing the subsamples, I analyze the commitment nature of tangible assets for firms in the weak creditor rights countries. The result shows that firms adjust book leverage ratio by 5.9% more speedily if those firms possess higher tangible assets, *ex-ante* than firms with low tangible assets, given the creditor rights are weak. This effect is enhanced further when firms are over-levered. As discussed before, due to reduced financial flexibilities, firms are reluctant to adjust their debt when over-levered. This reluctance may be acute if the creditors' monitoring, i.e., creditor rights, is low. If commitment figures prominently in lenders' and issuers' decision making, then it should drive firms to adjust their over-levered positions even when effective monitoring from creditors is constrained by institutional considerations. Consistent with the hypothesis, I find that over-levered firms with higher tangible assets increase the adjustment speed by 7.8% though located in lower creditor rights environment than firms with low tangible assets located in the same creditor rights environment.

[8] Creditor rights index ranges from 0 to 4, where 0 represents the weakest rights and 4 represents the strongest. Each of the four components of the index adds 1 to the index value if the component is present in the country. The components of creditor rights are as follows: MGMT_NOT_ STAY (captures the ability of creditors or courts to replace the incumbent management during bankruptcy), NO_AUTOSTAY (equals one if the bankruptcy code prohibits an automatic stay on assets), RESTRICT_REORG (equals one if the bankruptcy code prevents management from unilaterally filing a reorganization plan), and SECURED_FIRST (equals one if secured creditors' claims are given absolute priority relative to the government or employee claims).

In the final test, I examine how the commitment value of collateral associates with the investment opportunities that arise over time. Prior evidence suggests that firms, on average, are under-levered relative to what the static trade-off model predicts (Graham, 2000). Perhaps, firms prefer to preserve the debt capacity for future financing needs and adjust to the target capital structure slowly (Byoun, 2008). However, anecdotal evidence is less supportive that being under-levered increases the ability to use financial flexibility to capitalize on investment opportunities (Bessler et al., 2013). In Bessler et al. (2013), unconstrained firms (financially flexible firms) with higher cash holding increase the investment. However, DeMarzo (2019) states that claims against cash or cash flows suffer for non-exclusivity, but claims against the collateral do not. Firms having higher commitment as collateral can mitigate the non-exclusivity problem, which reduces the associated adverse selection problem and enhances future investment by issuing less expensive secured debt financing. Thus, looking at the financing and investment behavior of under-levered firms provides another setting to test collateral's commitment effect.

Based on the foregoing, I posit that having more tangible assets helps firms to use financial flexibility with a lower cost of debt. DeMarzo (2019) shows that issuing secured debt can restore the firms' ability to capture the funding cost advantages of leverage. In contrast, firms with lower tangible assets cannot utilize the debt capacity cheaply even though they have financial flexibility, due to their presumed inability to issue secured debt and therefore having to rely on more expensive unsecured debt (Benmelech & Bergman, 2009; Bates, Kahle, & Stulz, 2009). Thus, I assess firms' ability to take on profitable projects by regressing investment on Q as in Cleary (1999) when firms have high tangible assets. I find that firms with higher financial flexibility (low leverage) can utilize the financial flexibility to make more investment decisions if firms possess higher tangible assets, *ex-ante*. The interaction effect of financial flexibility and tangible assets is positive and significant offers consistent results with the hypothesis indicating that financially flexible firms invest more

when they possess higher tangible assets. Relating this to capital structure dynamics, I find that financially flexible firms with higher tangible assets are likely to issue debt because of the higher associated commitment enabling them to adjust their leverage ratio towards the target.

This study contributes to our knowledge of capital structure in several ways. First, to the best of my knowledge, this is the first study that empirically examines the role of tangible assets in the capital structure not previously emphasized—its role as a commitment. Second, I contribute to the dynamic capital structure (SOA) literature. In this paper, I argue that the commitment nature of tangible assets fosters a faster adjustment of leverage towards the target. The results offer robust evidence of faster leverage ratio adjustments to the optimal when firms possess more tangible assets. Third, I contribute to the investment literature. I show that firms with higher tangible assets can also increase investment if firms have higher financial flexibility. Lastly, I contribute to international capital structure literature. I show that institutional heterogeneity across countries has significant implications for the role of tangible assets as a determinant of firm leverage in the context of its role as a commitment device.

The paper is organized as follows. In Section 1.2, I survey the existing literature. Next, I develop the testable hypotheses in Section 1.3. Section 1.4 presents the data and sample statistics. In Section 1.5, I discuss the results of the role of tangible assets as a commitment mechanism. In section 1.6, I consider endogeneity issues. Section 1.7 examines investment decisions with financial flexibility. In Section 1.8, I perform some robustness tests. Finally, Section 1.9 concludes the paper.

1.2. Literature Review

The first part of this section presents a brief overview of the capital structure literature mainly from a static decision perspective. The second part presents an overview of the capital

structure from a dynamic perspective, a framework that is more suited to the investigation into collateral as a commitment device.

1.2.1. Capital Structure from a Static Perspective

In the perfect market world of Modigiliani and Miller (1958) with no taxes, the choice between debt and equity is irrelevant. Following this ground-breaking research, subsequent theoretical and empirical research have identified conditions and factors that imply capital structure relevance (Graham & Leary, 2011; Graham, Leary, & Roberts, 2015; Harris and Raviv, 1991; Rajan & Zingales, 1995). Although capital structure relevance literature can be classified in different ways, it is useful to classify it into the demand-side and supply-side view of leverage. Notably, the demand-side view is motivated by highly prominent theories, such as Modigliani and Miller's (1958) tax subsidy model, pecking order theory (Myers & Majluf, 1984), trade-off theory (Kraus & Litzenberger, 1973), asset substitution theory (Jensen & Meckling, 1976), and many others. These theories focus on firm-level determinants of capital structure, e.g., tangible assets or collateral. On the other hand, the supply-side view of the capital structure emphasizes the completeness and enforceability of the contracts that increase the accessibility of external financing (Holmstrom & Tirole, 1997). Faulkender and Petersen (2006) find that firms with higher credit ratings have significantly higher debt ratios; thus, firms without access to bond markets face a different supply schedule. Other studies reinforce the identification of supply effects by analyzing the shocks in the supply curve for the bank-dependent firms. Sufi (2009) finds that the introduction of bond ratings for syndicated loans increases debt issuance and investment opportunity for riskier borrowers. The supply of debt is further contingent upon the competition of the banks. Rice and Strahan (2010) study the change in competition due to bank deregulation and find that the credit supply is lower for the states of stricter restrictions. Thus, the supply side is affected by the strength of creditor rights, market competition, and institutional factors that ease access to the debt market.

This research focuses on tangible assets or collateral as a natural commitment device that can mitigate firm-level and market-level frictions. The traditional capital structure literature has long recognized the importance of tangible assets as an essential determinant of firm leverage policy (Frank & Goyal, 2009; Guedes & Opler, 1996; Oztekin, 2015; Rajan & Zingales, 1995; Titman & Wessels, 1988). Campello and Giambona (2013) find that tangibility is one of the single most important factors of leverage. They further add that asset tangibility enhances the debt capacity of a firm by reducing the market friction for corporate borrowing. Theoretical research emphasizes collateral as the first-order factor of financing in many of the models (Banerjee & Newman, 1993; Bernanke & Gertler, 1989; DeMarzo, 2019; Kiyotaki & Moore, 1997; Rampini & Viswanathan, 2013). Such papers argue that the information asymmetry between insiders and outsiders creates an agency cost, but collateral helps to reduce this cost to a possible optimum level. Higher repossession value and lower asymmetric information about the quality of tangible assets help firms to get more external financing at an affordable price (Hart & Moore, 1994). Consistent with this view, Bates, Kahle, and Stulz (2009) find that firms with lower tangible assets face a higher cost of debt.

1.2.2. Dynamic Capital Structure

The traditional trade-off and pecking order theories consider capital structure as a static decision. The limitation of the static choice of capital structure is that it ignores firms' optimal restructuring choice due to the fluctuation of the asset value over time. In practice, the capital structure decision is dynamic (DeMarzo, 2019; Fischer, Heinkel, & Zechner, 1989). Though Lemmon et al. (2008) report the corporate capital structure is stable, other empirical studies provide evidence in favor of the existence of deviations from target capital structure. Pioneering research by Flannery and Rangan (2006) finds an SOA of 30% of leverage by the US firms. Kayhan and Titman (2007) find a slower SOA of 10%, perhaps, due to different methodologies. In another

study, Huang and Ritter (2009) find that SOA is between 11% and 23%. The speed of adjustment literature further disentangles the rates of the adjustment analyzing various firm-level and country-level factors. Reasons for the deviation include the institutional environment (Oztekin & Flannery, 2012), the magnitude of the financial deficit (Faulkender et al., 2012), macroeconomic conditions (Cook & Tang, 2010), debt covenants (Devos et al., 2017), credit supply (Rahman, 2019), and so on. Though the capital structure literature and SOA literature is huge and substantial, the role of tangible assets in the adjustment process of leverage is yet to be explored in the literature.

1.3. Hypotheses Development

As mentioned in the introduction, in an influential paper DeMarzo (2019) makes a case for the importance of commitment as a primary determinant of capital structure and collateral is one of the essential commitment mechanisms. Consistent with DeMarzo (2019), I argue that firms dynamically adjust the capital structure towards the target to fulfill their commitment. Any deviation from the target capital structure will be anticipated by the creditors; thus, they set the price of the debt accordingly that will offset the tax advantage of debt. On the other hand, firms with higher commitment (high tangible assets) would not deviate from the target leverage because issuing excessive debt will destroy firms' value. DeMarzo(2019) also states that firm without commitment, ex-ante, actively manages its capital structure at each point to maximize the shareholders' value. In this case, firms do not choose to actively reduce the leverage instead they deviate more from the optimal capital structure even though it may be detrimental to the firm value (Admati et al., 2018). If firms are not committed, they cannot increase the firm value by issuing debt from the under-levered position either because of higher cost of unsecured debt. Thus, lack of commitment prevents shareholders from capturing any valuation gain of debt. Consistent with this

theoretical background, I argue that firms having higher tangible assets are more committed to the creditors. Hence, firms with higher tangible assets adjust their leverage ratio more speedily towards the target leverage ratio to maintain the commitment than those of lower tangible assets.

H1. Firms with higher tangible assets adjust the leverage ratio towards the target faster than firms with lower tangible assets.

1.3.1. Over-leverage and Dynamic Capital Structure

Prior studies suggest that the SOA of capital structure is asymmetric (Faulkender et al., 2012). Over-levered firms face more costly financing than under levered firms (Byoun, 2008). Moreover, over-levered firms may experience several types of adjustment costs, i.e., expensive financing, covenant violations, and so on. On the other hand, de-levering from an internal source (e.g., cash) may further deepen the financial inflexibility and preclude opportunities to invest in future projects from cash on hand. Therefore, over-levered firms often choose to remain over-levered or move further away from the target capital structure (Admati et al., 2018). However, firms with higher commitment set the leverage ratio close to the target because the higher cost of taking excessive leverage offsets the tax advantage of the leverage. According to the DeMarzo (2019), creditors anticipate the expropriation behavior of firms and set debt prices accordingly, thus, shareholders do not get benefit from the additional leverage. Consistent with this belief, I argue that collateral's commitment value prompts faster adjustment towards the target, even when the cost of adjustment is expensive from the over-levered position.

H2a. Over-levered firms with higher tangible assets adjust their leverage ratios towards the targets faster than do over-levered firms with lower tangible assets.

The commitment test is especially severe when over-levered firms are subject to deficit financing, i.e., net cash flows are negative after taking into account investment needs. Firms with

surplus financing can easily de-lever using internal sources (Byoun, 2008). But, adjustment to target by over-levered firms in the presence of deficit financing would be especially a relevant test of the commitment hypothesis. I hypothesize that firms having higher tangible assets, *ex-ante*, adjust leverage faster than those of lower tangible assets from the over-levered positions even though they have deficit financing.

H2b. Given the firms are over-levered and have deficit financing, firms with high tangible assets adjust the leverage ratio faster towards the target than those with low tangible assets.

Another stress test of commitment relates to the adjustment of leverage by over-levered firms during declining profitability. The empirical association between profitability and leverage is negative (Frank & Goyal, 2009; Guedes & Opler, 1996; Oztekin, 2015; Rajan & Zingales, 1995; Titman & Wessels, 1988). However, increasing leverage or even keeping leverage unchanged during declining profitability periods increases the likelihood of distress because the interest coverage ratio declines. I argue that firms' higher commitment motivates them to reduce debt rather than increasing it from the over-levered positions to shield them from financial distress. Thus, I hypothesize that over-levered firms with higher commitment increase the adjustment speed of leverage when their profitability declines.

H2c. Given firms are over-levered and experiencing declining profitability, firms with higher tangible assets adjust the leverage ratio faster than those with low tangible assets.

1.3.2. Creditors' Rights and Dynamic Capital Structure

The role of commitment is especially valuable where oversight by creditors is insufficient. Given the international dataset, creditor rights differences across countries serve as a useful proxy for creditors' oversight capability. Strong creditor rights enhance *ex-ante* contractibility (Rajan & Zingales, 1995). In other words, strong creditor rights protect creditors from shareholder

expropriation making firms more disciplined. Leverage increases the firm-level risk that benefits shareholders at bondholders' cost (Jensen & Meckling, 1976). Thus, stronger creditor rights lead firms to adhere to capital structure (Oztekin, 2015) through lenders' monitoring (Rajan & Zingales, 1995). On the other hand, the lack of monitoring in the weak creditor rights countries may lead to covenant violations as well as the deviation from the optimal capital structure (Daher, 2017). In this context, firms that are highly committed upfront will comply with debt covenants regardless of their countries' creditor rights framework.

H3a. Firms with high tangible assets in weaker creditor rights countries adjust leverage faster than those with low tangible assets in the same countries.

As discussed before, firms incur higher expenses to adjust leverage when they are over-levered due to the reduced financial flexibility (Byoun, 2008; Faulkender et al., 2012). Hence, firms often show reluctance to reduce leverage from the over-levered positions and may even move farther from the target leverage (Admati et al., 2018). This problem is expected to become more acute if the creditors' monitoring is weak, especially in low creditor rights environments. On the other hand, stronger creditor rights are associated with higher leverage adjustment (Oztekin, 2015). Thus, the commitment nature of collateral appears less important in the stronger creditors' protection countries. In light of the discussion, I argue that the commitment between borrowers and lenders becomes more vital to leverage adjustment from the over-levered position for the firms headquartered in weak creditor rights countries than ones in high creditor rights countries.

H3b. Over-levered Firms with high tangible assets in weaker creditor rights countries adjust leverage faster than over-levered firms with high tangible assets in stronger creditor rights countries.

1.3.3. Tangible Assets, Financial Flexibility, and Investment Decision

Firms adjust leverage towards the targets when they invest in a large project (Dudley, 2012). Capital structure decisions by firms are puzzling because most firms borrow less than their debt capacity (Graham, 2000). One reason that firms intentionally retain spare debt capacity might be to access the capital markets in the event of positive shocks to their investment opportunities (Modigliani & Miller, 1963). Otherwise, firms may forego some of the profitable projects. Marchica and Mura (2010) find that firms with higher financial flexibility (spare debt capacity) make more investments in issuing new debt financing. However, in the absence of collateral, firms may not have access to cheap external financing, as Benmelech and Bergman (2009) and Bates, Kahle, and Stulz (2009) find a negative association between collateral and credit spread. The cost advantage of debt may disappear if firms issue unsecured debt (DeMarzo, 2019) as lenders perceive borrowers as risky without collateral. As a result, positive NPV projects may become unattractive due to the higher cost of unsecured financing. I argue that firms with higher tangible assets and financial flexibility can better adjust leverage towards the target, enabling them to undertake profitable investment opportunities. Financially flexible firms (under-levered ones) with high tangible assets can adjust leverage towards their target to invest in new projects. This is how they can maintain the commitment of keeping the leverage ratio towards the targets. I make another relevant hypothesis that firms with high tangible assets and spare debt capacity issue debt to maintain capital structure targets.

H4a. Firms with higher tangible assets invest more if they have spare debt capacity than those of lower tangible assets but with spare debt capacity.

H4b. Firms with high tangible assets and spare debt capacity issue more debt than equity.

1.4. Data and Sample Description

In this section, I describe the data, sources of data, and the data cleaning processes to get the final sample of the study.

1.4.1 Data

The sample consists of firm-level data from the COMPUSTAT Global database for the years 1990 through 2018. COMPUSTAT Global database contains accounting data for over 24,000 firms in countries outside the U.S. and Canada.[9] Moreover, I use a series of country-level control variables collected from a variety of sources. Country-level governance data is from World Governance Indicators (WGI).[10] GDP, stock and bond market development, inflation, and the time required for enforceability are collected from World Development Indicators (WDI). The creditor rights data is from La Porta et al. (1997), hereafter LLSV (1997), and Djankov et al. (2007). Finally, I use the mergers and acquisition data from SDC platinum to calculate measures of asset redeployability.[11]

The raw data sample in the study includes 662,933 international firm-year observations from COMPUSTAT Global. I then apply a series of filters. Following Morellec et al. (2018), first, I drop all regulated (SIC 4900-4999) and financial firms (SIC 6000-6999). Then, I drop firm-years if key variables, e.g., cash, tangibility, total assets, cash-flow, book leverage, total debt ratio, are

[9] In case I find any North American firms in the study, I drop them. I collect US sample from COMPUSTAT to test robustness of the results using US sample.

[10] Almost 200 countries that report the aggregate and individual governance indicators are recorded in the WGI project. I collect six variables from the database: Voice and Accountability, Political Stability, Governance Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

[11] I use SDC platinum to calculate the historical mergers and acquisition transaction value of the completed mergers and acquisition deals to use in the instrumental variable appraoch. I obtain the value of all M&A activity involving publicly traded targeted firms in each of the 3 digits SIC industry from SDC. SDC covers all the countries in the sample period. The available datapoint decreases to 77,398 firm-year observations when I use the M&A activities as instrument in the IV regressions. The details of the variable are in Appendix B.1.

missing. I also exclude firm-years if cash, total assets, and sales are negative. Further, I eliminate firms with excessive debt ratios that are likely due to reporting errors. In particular, I drop firms with ratios that exceed one for the following leverage measures: long term debt to total assets, short term debt to total assets, and total debt to total assets. To keep the sample free from small firm bias, I exclude firms if the total assets' value is less than USD 1 million.[12] I only consider countries that are also included in LLSV (1997), the source of creditor rights data. Finally, I drop observations if the dependent and independent variables of the regressions are missing. The final sample includes 149,859 firm-year observations from 32 countries covering the period of 1990 to 2018.

1.4.2 Sample Descriptive Statistics

Table 1.1 reports the country-wise summary statistics of the main variables. Australian, British, and South Korean firms dominate the sample. Australian firms account for almost 11.2% of observations. On average, Australian firms possess 34.2% of fixed assets (PPENT/AT) in the asset portfolio. Noticeably, the book leverage of Australian firms is lower than that of other countries. On average, Australian firms use 12.8% book leverage in their capital structure and maintain on average 14.0% market leverage. The creditor rights index in Australia is high, 3 out 4. UK firms are the second most dominant sample in the study with 13,488 firm-year observations accounting for 9% of the total sample size. On average, these firms use 17.4%, and 20% book leverage and market leverage in the capital structure. The average fixed assets of UK firms is 27.9% of its total assets. Creditor rights in the UK are perfect, meaning 4 out of 4. South Korean firms comprise the third-largest subset at 9% of the sample. On average, South Korean firms use 27.1% of total debt in the capital structure with 41.1% market leverage. For South Korean firms, fixed assets make up 33.6% of assets and the creditor rights index is 3. At the other end, Zimbabwe has

[12] The data is inflation (CPI) adjusted at the year 2004 level.

the fewest observations with only 32 firm-year observations. Most surprisingly, these firms possess a higher proportion of fixed assets at 43.9%, but comparatively a lower total debt ratio of 14.3%. Moreover, creditors get higher protection in Zimbabwe as the index value is 4.

Table 1.2 panel A reports descriptive statistics of the variables used in the regressions. The mean total value of assets in USD is 1,478.502 million, while the median value is 141.782. The mean and median value of the capital expenditures scaled by total assets are 0.048 and 0.029 respectively. Tangible assets to total assets have a mean (median) value of 0.309(0.272). The mean (median) value of the market to book ratio is 1.586 (1.146). The sample mean of book leverage is 21.1% and the average market leverage is 27.6%. The Altman Z score measure of financial distress averages 1.272 and the fiftieth percentile value is 1.427. Lastly, the average (median) of creditor rights is 2 (3). Table 1.2 panel B presents the correlation matrix of change of leverage and all the independent variables. Results show that firms' fixed assets and mean industry leverage are negatively correlated with both changes of book leverage and market leverage. Besides, firm size, tangible assets, and mean industry leverage are also negatively associated with the leverage ratio change. On the other hand, growth opportunities, Z-score, creditor rights correlate positively with the change of the leverage ratio. There is little evidence that firm-level independent variables correlate with size.

1.5. Empirical Results of Capital Structure Dynamics

Following standard dynamic capital structure models, I estimate firms' capital adjustments towards the target using a partial adjustment model (Flannery & Rangan, 2006; Faulkender et al., 2012; Oztekin & Flannery, 2012; and Oztekin, 2015). I use the system GMM proposed by Arellano

and Bover (1995) and Blundell and Bond (1998).[13] Conventionally, the adjustment towards the capital structure is estimated using the following equation:

$$\Delta Lev_{i,t+1} = \alpha + \lambda \left(DEV^{*}_{i,t+1}\right) + \epsilon_{i,t+1} \quad (1)$$

Where, $\Delta Lev_{i,t+1} = Lev_{i,t+1} - Lev_{i,t}$. $Lev_{i,t+1}$ is the leverage (book or market leverage) ratio at time $t+1$. $DEV^{*}_{i,t+1}$ is equal to $Lev^{*}_{i,t+1}$ minus $Lev_{i,t}$, while $Lev^{*}_{i,t+1}$ is the estimated target debt ratio regressing the firm characteristics at time t using equation (2). λ captures the SOA towards the target capital structure of a firm.

I begin by estimating the partial adjustment model of leverage ratio using the following restricted model:

$Lev^{*}_{i,t+1} = \beta X_{i,t}$:

$$Lev_{i,t+1} = \gamma\beta X_{i,t} + (1-\gamma) * Lev_{i,t} + d_t + \epsilon_{i,t+1} \quad (2)$$

Where β is a coefficient vector of the control variables to estimate the leverage ratio.[14] Following existing literature, I primarily take 13 firm, industry, or country-level control variables that determine the capital structure. The firm-level controls are tangible assets, firm-size, return on

[13] System GMM is the augmented version of the difference GMM developed by Blundell and Bond (1998). The SOA (SOA) literature predominantly uses Blundell and Bond system GMM to model the dynamic capital structure.

[14] Faulkender et al. (2012) considered firm fixed effects in the model. I use Blundell and Bond (1998) 2 step system GMM to predict the leverage ratio in equation (2). Faulkender et al. (2012) conclude that the Blundell and Bond (1998) system GMM estimations methods provide adequate estimates. System GMM considers orthogonal deviations instead of the first differencing. According to Roodman (2003) "Same as differencing, taking orthogonal deviations removes fixed effects. Because lagged observations of a variable do not enter the formula for the transformation, they remain orthogonal to the transformed errors (assuming no serial correlation), and available as instruments. In fact, for consistency, the software stores the orthogonal deviation of an observation one period late, so that, as with differencing, observations for period 1 are missing and, for an instrumenting variable w, $w_{i,t-1}$ enters the formula for the transformed observation stored at i,t. With this move, exactly the same lags of variables are valid as instruments under the two transformations."

asset, market to book ratio, research and development scaled by sales, and Altman Z score. Industry mean leverage is the only industry-level control in the model. Moreover, I take the following country-level factors: GDP per capita, the enforceability of the contracts, the rule of law, government effectiveness, creditor rights, and stock market development. Variable descriptions are provided in Appendix B.1. Equation (2) requires instruments for the endogenous variables and lagged dependent variables. Huang and Ritter (2009) and Flannery and Hankins (2013) state that Blundell and Bond System GMM can sufficiently estimate the adequate coefficients. Thus, in this SOA study, I use a 2-step system GMM taking the lag of right-hand side variables as the instruments of the same variables consistent with Oztekin (2015). I test the validity of the models and find the tests are valid using the Wald test and AR2 test. Appendix A.1 reports the result of equation (2).

After estimating equation (2) using Blundell and Bond's system GMM, I predict the leverage ratio, $Lev^{*}_{i,t+1}$. Next, I estimate equation (1) using OLS with bootstrapped standard errors. Table 3 reports the SOA of leverage of the firms globally. I find that the SOA of book leverage is 20.1%, which corresponds closely to Faulkender et al. (2012). Using the US sample, Faulkender et al. (2012) find that the average SOA is 21.9%, while Oztekin and Flannery (2012) report 21.1% for the global firms. Panel A column 2 reports the SOA for market leverage of the global firms is 23.1%, while Faulkender et al. (2012) find the SOA of 22.3% for the US firms.[15]

[15] Yin and Ritter (2020) state that SOA of market leverage estimates upward bias due to the passive influence of stock price fluctuations. Firms adjust book leverage and empirical evidence supports that they don't issue securities to offset the market leverage. Thus, the empirical determination of market leverage's speed of adjustment is flawed (Yin and Ritter, 2020). In another study by Kisgen (2009) finds that firms tend to target their book leverage rather than the market leverage ratio. Moreover, the survey of Graham and Harvey (2001) shows that CFOs do not rebalance the leverage ratio based on the market equity value.

1.5.1. Tangible Assets and SOA of Leverage

To test whether tangible assets affect a firm's speed of adjustment toward its target leverage ratio, I decompose the coefficient λ.[16] Following Faulkender et al. (2012) and Devos et al. (2017), I modify equation (1) by specifying that a firm's adjustment speed λ depends on a variable of interest (in this case, this variable is tangible assets or collateral). Thus, the marginal effect of tangible assets in the SOA of leverage can be expressed in equation (3).

$$\Delta Lev_{i,t+1} = \alpha_0 + \lambda_1 * DEV^*_{i,t+1} + \lambda_2 HighTangible_{i,t} + \lambda_3 * HighTangible_{i,t} * DEV^*_{i,t+1} + \epsilon_{i,t+1} \quad (3)$$

Where, $\Delta Lev_{i,t+1} = Lev_{i,t+1} - Lev_{i,t}$. $Lev_{i,t+1}$ is the leverage (book or market leverage) ratio at the time *t+1*. $DEV^*_{i,t+1}$ is equal to $Lev^*_{i,t+1}$ minus $Lev_{i,t}$, while $Lev^*_{i,t+1}$ is the estimated target debt ratio regressing the firm characteristics at time *t* using equation (2). $HighTangible_{i,t}$ is a dummy variable of 1 if tangible assets are larger than the industry median value at time *t*. One may argue that the level of tangible assets is partially determined by the industry that a firm belongs. By taking higher than the industry median value, the model captures the effect of high tangible assets in the SOA of leverage within each industry in comparison to those of lower than the industry median value.

Panel B of Table 1.3 reports the effect of asset tangibility on the SOA.[17] Column 1 reports that firms with high tangible assets adjust the book leverage ratio by 21.5% (18.5%+3.0%), while the firms with low tangible assets adjust book leverage by 18.5%. More precisely, firms with low

[16] The previous literature shows the role of various firm level characteristics and their impact on the SOA of the leverage, e.g., growth firms (Drobetz & Wanzenried, 2006), financial constraints (Korajczyk & Levy, 2003), over-levered firms (Hovakimian, Opler, & Titman, 2001).

[17] High tangible assets is a dummy variable equal to 1 if a firm's tangible assets are higher than the industry median tangible assets. The results are robust when I use tercile instead of the median tangible assets to determine the high tangible assets dummy.

tangible assets need 5.41 years (1 over 0.185) to adjust their leverage towards the optimal. On the other hand, firms with high tangible assets can close the gap in 4.65 years, which is nine months less than firms with low tangible assets. Column 2 reports that firms with high tangible assets adjust the market leverage ratios by 24.6%, which is 3% faster than firms with low tangible assets. It means that firms with high tangible assets can close the gap between the target leverage and actual leverage in 4.06 years (1 over 0.246), which is seven months less time than firms with low tangible assets. Standard errors are bootstrapped standard errors replicated ten times. Both the coefficients are economically and statistically significant at 1% level. The results offer a consistent viewpoint with the hypothesis *H1* that tangible assets enhance the SOA if firms deviate from the target.

1.5.2. Asset Tangibility and SOA: Over and Under Leverage

The lack of commitment leads borrowers to assume excessive leverage (Bizer & DeMarzo, 1992) that increases the conflict between creditors and management (shareholders). Especially, the tension intensifies if the firms are over-levered. Often, firms show reluctance to adjust the leverage ratio as the adjustment is costly. The cost of adjustment is higher for firms that are over-levered as the firms become financially inflexible to finance from external sources (Byoun, 2008). In other words, the cost of losing flexibility is endogenously increasing and convex in the amount of external funds (e Whited, & Wu, 2016). Thus, firms choose to remain over-levered due to the associated higher adjustment costs. In hypothesis *H2a*, I argue that even though the cost of adjustment for over-levered firms is higher, over-levered firms with higher tangible assets display higher commitment increasing the SOA of the leverage ratio towards the target to maintain its commitment. Table 1.4 panel A columns (1) and (2) report that over-levered firms increase the SOA by 7.2% and 4.3% of the book and market leverage, respectively, supporting the hypothesis *H2a*. On the other hand, columns (3) and (4) report the adjustment speed when the firms are under-

levered. Under-levered firms with high tangible assets increase the book leverage's adjustment speed towards the target by 7.2%.

1.5.2.1. Adjustment of Over-leverage Position if Firms Have a Deficit Financing

Byoun (2008) finds that over-levered firms are unlikely to reduce their leverage if they have a financial deficit. Byoun's findings suggest that over-levered firms adjust leverage toward the target from their financial surplus. Using surplus funds to adjust the leverage ratio has lower adjustment costs. Though costly, over-levered firms with financing deficits have the option of adjusting towards the target leverage ratio by issuing equity. I argue that firms are self-motivated to assume this extra cost due to the initial commitment to the lenders. Thus, in hypothesis *H2b*, I predict that over-levered firms adjust their leverage ratio towards the target though they have a deficit financing. In table 4 panel B, I document the SOA for high tangible assets firms that are over-levered and having deficit financing simultaneously. Following Frank and Goyal (2003, page 221), I calculate the deficit financing as the sum of dividends, investment, and change of working capital minus internal cash flow scaled by total assets.

Table 1.4 panel B column 1 reports the adjustment of book leverage for over-levered and deficit financing firms. The results display that over-levered firms with deficit financing increase the adjustment speed by 6.7%. The results are both statistically and economically significant. In column 2, I find that over-levered and deficit financing firms enhance the market leverage's adjustment speed by 3.7%. Overall, the results are consistent with the commitment value of tangible assets.

1.5.2.2. The Commitment of Over-levered Firms During Declining Profitability

The existing literature counter-intuitively finds a negative association between profitability and leverage ratio (Frank & Goyal, 2009; Titman & Wessels, 1988). Oztekin (2015) finds that leverage ratios are negatively associated with profitability for firms from 23 out of 25 countries. Declining profitability leads firms to distress or financially constraint. In this situation, the interest coverage ratio decreases if firms do not decrease leverage; thus, it intensifies the tension between the creditors and borrowers. From a commitment perspective, I argue in hypothesis *H2C* that firms' *ex-ante* higher tangible assets increase the commitment to lenders and result in a speedier adjustment of leverage when firms' profitability declines. By reducing the leverage ratio, firms can increase the interest coverage ratio and avoid distress costs.

To test this belief, in Table 1.4 panel B, I run equation (3) in a sub-sample of firms that are over-levered and experiencing declining profitability for the last three years.[18] I compare the SOA of high commitment firms against low commitment firms, given that firms are both over-levered and experienced declining profitability. In column 3, I find that over-levered firms with declining profitability increase book leverage's adjustment speed by 11.0% if firms have higher tangible assets compared to those having lower tangible assets. The result is both statistically and economically significant. In column 4, using market leverage I do not find the interaction effect as significant. Overall, the results are mixed. Firms with high commitment adjust the book leverage when the firms are over-levered and face declining profitability, but the results with the market leverage are not robust.

[18] I create a sub-sample of firms if the profitability of the firms declines for previous consecutive three years. I consider the observations as missing if any of the previous three years' data is missing.

1.5.3. SOA, Creditors' Rights, and Tangible Assets

Up until now, I did not consider the institutional heterogeneity in different countries other than as control variables. In this section, I extend the analysis of the association of tangible assets and leverage ratio in different institutional settings, i.e., creditor rights. The commitment nature of tangible assets is important in a weak creditor rights environment because the deviation from the target may be persistent due to the weaker enforceability.[19] As a shield of protection, creditors typically add a variety of covenants in weak creditor rights countries, e.g., imposing a low dividend payout clause (Brockman & Unlu, 2009). Thus, the commitment to lenders becomes vital in this case. I hypothesize in *H3a* that firms with higher tangible assets exhibit a higher commitment to lenders by speedier adjustment of leverage ratio towards the target, especially if the institutional monitoring from creditors is weak. Table 5 presents the role of tangible assets in the speed of the adjustment process of leverage in the weaker and stronger creditor rights countries.

In Table 1.5 Panel A, column 1 presents the marginal effect of having higher tangible assets in the SOA of book leverage for firms located in weaker creditor rights countries. Firms with higher tangible assets increase the book leverage ratio's adjustment speed by 5.9% faster than firms with lower tangible assets in weaker creditor rights environment. The coefficient is economically and statistically significant at 1% level. The SOA of market leverage is 29.3% for firms with high tangible assets in comparison to the SOA of 27.1% for firms with low tangible assets. Overall, the results are consistent with the hypothesis *H3a* that firms with higher tangible assets increase the SOA of leverage even if creditors' protection is weak. In columns 3 and 4, the interaction effect of high collateral and deviation is insignificant when creditor rights are strong, meaning that the

[19] Stronger creditor rights is associated with a faster leverage adjustment by 1% to 6% (Oztekin, 2015). Thus, the commitment nature of tangible assets may be redundant here.

collateral's commitment nature is not important when the creditors' protection is strong. The findings support the view that creditor rights and asset tangibility are substitutes.

As previously discussed, firms are reluctant to adjust leverage if over-levered due to higher adjustment costs (Byoun, 2008). Thus, a natural question arises whether firms adjust over-levered positions when the creditors' monitoring is low. Though the cost of adjusting the leverage is high for the over-levered firms, I hypothesize in *H3b* that firms with higher collateral adjust leverage towards the target to maintain the commitment even though the creditors' monitoring is low. Table 1.5 panel B performs the analysis in two subsamples: low creditor rights and over-levered and high creditor rights and over-levered. Column 1 shows that firms with high commitment and being over-levered in weaker creditors' right countries adjust the book leverage back to the target by 7.8% faster than those firms with low commitment in the same countries. Column 3 reports that firms with higher tangible assets adjust the market leverage. I find that firms with high commitment and are over-levered in weaker creditor rights countries adjust market leverage by 4.0% faster than those with low commitment. On the other hand, the sub-samples of over-levered and higher creditors' right display some interesting results. The interaction term is insignificant in columns 2 and 4, meaning that the collateral's commitment nature is not important in the high creditor rights countries. The results offer a consistent view with hypothesis *H3b* that the commitment is more prominent in the adjustment process if firms are over-levered and headquartered in low creditor rights countries than firms' are over-levered but headquartered in high creditor rights countries.

In table 1.6, a more granular test of examining each of the four components of creditor rights in the adjustment process is reported. I create four sub-samples where each of the elements of creditor rights is zero. From the results, I find that the interaction effect between high tangible and $DEV_{i,t+1}$ is positive for each component of creditor rights except SECURED_FIRST, meaning that the collateral's commitment nature fosters the speedier adjustment of leverage if these

components of creditor rights are absent in the country. The results support the previous findings in table 1.5. The most interesting findings of the table are the negative association between the interaction and dependent variables, change of leverage, when the country lacks secured creditors to pay first (SECURED_FIRST) provision in the creditor rights. The negative association is intuitive as this particular component does not provide secured creditors a higher priority of repossession, meaning that firms will rarely lose control of tangible assets in case of default. In this case, the commitment nature of tangible assets barely works. Columns 5 to 8 report the speed of adjustment of leverage when the components of creditors' rights are not zero. I find that the speed of association is less positive if firms located in countries with non-zero creditors' rights components and the tangible assets are higher. The results are consistent with previous findings that tangible assets commitment nature is less important when the creditors' rights of the country is higher.

1.6. Endogeneity

A big concern in testing the commitment feature of collateral in the leverage adjustment process is endogeneity. The endogeneity arises because the adjustment of leverage may increase the investment in tangible assets at the same time. Hence, asset tangibility and SOA may determine simultaneously that results in a reverse causality. This issue is more critical if firms are under-levered and issue debt to adjust the leverage ratio. Addressing the endogeneity, I adopt two techniques to mitigate the issue: instrumental variable approach and propensity score matching method. First, I adopt an instrumental variable approach (IV) by taking three instruments following Ortiz-Molina and Phillips (2014). The first instrument is the financial slack ($MNLPotBuy$) of rival firms. I take the minus average book leverage of the rivals in the industry (3 digits SIC code industry) averaged over the previous three years on a rolling basis to minimize the temporary impact. Second, total M&A transactions occurring in firm's industry in a given year

($TotM\&A$), which reflects higher liquidity of assets. I collect M&A transaction data from the SDC platinum. I consider only the completed deals following Ortiz-Molina and Phillips (2014). Along with the instruments mentioned above, I also use the mean industry (SIC 2 digit industry) tangible assets as an instrument of tangible assets. All these three instruments can explain tangible assets but do not directly affect an individual firm's leverage decision. To test the validity of the instruments, I consider two measures: Hansen J tests of overidentification and correlation between tangible assets and predicted tangible assets. I cannot reject the Hansen test's null hypothesis, meaning that the instruments are valid and exogenouos. Moreover, the correlation coefficient between the tangible assets and the predicted values is 0.69, which is quite high and validates the instruments.

Second, I adopt the propensity score matching (PSM) approach to match high tangible assets with low tangible assets firms. Since the endogeneity may arise from the causal inference, the PSM may better handle the issue as the method is very popular to estimate the reverse causality (Caliendo and Kopeinig, 2008). Specifically, the outcome involves speculation about how an individual firm would have performed if the firm had received the treatment. Here, I am concerned about how the firms' SOAs are affected if firms have higher collateral *ex-ante*. In this process, I create a treatment group of firms (with high collateral) and a control group of firms (with low collateral). First, I rank all the firms based on tangible assets and then identifying firms in the lowest (highest) quartile as low (high) collateral firms. Using this sample, I generate the propensity score running a logistic regression with a high tangible assets dummy as a dependent variable (1 for high quartile collateral firms and 0 for low quartile collateral firms) and size, profitability, market to book ratio, and R&D as independent variables for each of the industry. I then match each treatment observation without replacement with a unique control observation using a caliper

of 0.1% to find the closest match.[20] After matching, I get 29,030 firm-year pair observations as treatment and control groups. Using this propensity score-matched sample, I re-estimate equation (3).

Table 1.7, panel A (columns 2 and 3) reports the second stage regression results of the equation (3) using the instrumental variable approach. In column 1, I report the first-stage regression. Column 2 shows that the interaction effect between predicted high tangible assets and $Dev^{*}_{i,t+1}$ is positive and statistically significant at 1% level. More precisely, firms with high collateral adjust book leverage towards the target by 12.5% more speedily than firms with low tangible assets. In column 3, I report the SOA of market leverage. I find that firms with high collateral adjust market leverage by 7.45% more speedily than firms with low collateral. In panel B, I report the results using the propensity score matching approach. In column 1, the interaction coefficient is positive and significant at 1% level. More precisely, the firms with high collateral increase the SOA of book leverage by 3.6% than that of low collateral firms. Results using market leverage are not significant.

1.7. Investment Opportunity When Firms Have Financial Flexibility and Commitment

In this section, I explore the implications of commitment for exploiting investment opportunities. I argue that firms with higher financial flexibility can utilize it to invest in value-maximizing projects.[21] Financial flexibility refers to how easily firms are able to finance positive NPV investment opportunities. Under-levered firms can issue less expensive debt financing to invest in value-maximizing projects. Firms with higher tangible assets can enjoy better bargaining power in issuing debt (Benmelech and Bergman, 2009; Bates, Kahle, and Stulz, 2009). Moreover,

[20] Caliper refers to the difference in the predicted propensity scores between the treatment and the match.
[21] By financial flexibility, I mean that firms have spare debt capacity or firms are under-levered.

DeMarzo (2019) argues that firms with high collateral can commit to lenders by issuing secured debt. In contrast, firms with lower tangible assets (lower commitment) may have financial flexibility, but debt might be too costly to issue. The higher cost of financing could turn the positive NPV projects negative. In these circumstances, firms may forego some projects that would generate positive NPV with a lower cost of capital but become a negative NPV project because of additional financing costs.

This section argues that financially flexible and highly committed firms can issue debt financing at affordable conditions, eventually increasing investment opportunities. By issuing new debt from the under-levered positions, firms can adjust leverage towards the target and maintain commitment from the under-levered position. To test this, I use the following model to predict the investment of financially flexible firms (following Bessler et al., 2013 and Marchica & Mura, 2010).[22]

$$TotInv_{i,t} = \alpha + \beta_1 TotInv_{i,t-1} + \beta_2 CF_{i,t-1} + \beta_3 Tangible_{i,t-1} + \beta_4 FF2_{i,t} + \beta_5 TobinQ_{i,t}$$

$$+\beta_6 FF2_{i,t} * CF_{i,t-1} + \beta_7 FF_{i,t} * Tangible_{i,t-1} + d_t + d_i + \mu_{i,t} \quad (4)$$

where $TotInv_{i,t}$ is the sum of the capital expenditure, R & D expenditure, and sales and general expenditure scaled by total assets of a firm in period *t* following ghoule, Jackson, and Tao Ma (2018). $CF_{i,t-1}$ is the cash flow of a firm at period *t-1*. $Tangible_{i,t-1}$ is tangible assets of a firm at period *t-1*. $FF2_{i,t}$ refers to whether the firms are under levered for the last two consecutive years.[23] $TobinQ_{i,t}$ is the market to book ratio. d_t is the year fixed effects and d_i is the firm fixed effect.

[22] I augment the Q model of Cleary (1999) to see the marginal effect of the interaction effect between tangible assets and financial flexibility on the total investment.

[23] For robustness, I also consider previous three years and previous one-year under-leverage position to calculate the financial flexibility and find the results are robust. I did not report the results for the sake of brevity.

In Table 1.8, consistent with Marchica and Mura (2010), I find the positive association between investment and Tobin's Q. Columns 1 to 3 report the regression results of panel regression using pooled and fixed-effects models. Consistent with the hypothesis, I find that financially flexible, *FF2* dummy, firms with high tangible assets invest more in the next period.[24] In column 3, I include the industry fixed effect along with the year fixed effect to capture the industry level variation as some industries may invest more than others. I find that the results are robust. Importantly, one might argue that a fraction of the investment may reflect an increase in collateral; thus, there is a potentiality for endogenous association. I address this concern and adopt the instrumental variable approach to handle this reverse causality issue. I use the same instruments that I use in section 6. In column 4, I report the second stage regression results of an instrumental variable approach.[25] I find robust evidence that firms with financial flexibility increase the investment with the increase of tangible assets.

A relevant question arises how do under-levered firms finance the investment, debt or equity? Dudley (2012) argue that firms issue debt to adjust the leverage ratio towards the target to take a large project. I argue that the collateral's commitment nature fosters the adjustment process of leverage towards the optimal if firms need to invest more. Following Hovakimian, Opler, and Titman 2001, I run the probit regressions to estimate the effect of financial flexibility on equity or debt issuance in table 1.9 in a sub-sample of higher commitment at the beginning of the period.[26] I find that the association of $FF2$ on debt issue (equity issue) is positive (negative) and statistically significant at 1% level. More specifically, the likelihood of issuing debt is 4.0%, while firms reduce

[24] The empirical findings further provide evidence that the interaction effect between the low tangible assets and financial flexibility is negative, meaning that low tangible assets firms invest less even though these firms have higher financial flexibility. The results are displayed in Appendix A.2.
[25] I use the same control variables that are used in table 7.
[26] I use split regressions since interaction terms are difficult to interpret in a probit setting (Norton, Wang, and Ai, 2004).

equity issue by 2.2% if firms have both financial flexibility and high tangible assets. The results support the empirical assumption that highly committed firms adjust the leverage ratio towards the target.

1.8. Robustness Check Using US Data

The global database of this study does not include US firms. Though this is only one country, the generalizability of the results may be called into question as the US firms, both in numbers and market capitalization, often dwarf all other countries. Thus, this global study may remain incomplete if I do not consider the US sample. This section appends the US firm-year observations to the global sample to validate the original findings. Table 1.10 panel A replicates table 4 including the US firm-year observations with the global data. Consistent with the previous findings, I find that the interaction term between the high tangible assets and $DEV^{*}_{i,t+1}$ is positive. Firms with more tangible assets increase the adjustment of book leverage by 3.3%. Column 2 confirms the results using market leverage. Both of the results are economically and statistically significant. In panel B, I present results only with the US sample. US firms with more tangible assets adjust book leverage (market leverage) by 6.8% (11.4%) faster than those of low tangible assets, again consistent with the commitment hypothesis.

In table 1.11, I check for robustness excluding the dominating countries from the sample, i.e., the US, Australia, and the UK. In panel A, I exclude all three dominating countries from the sample and find that firms from other than these three countries enhance the book's adjustment speed (market) leverage ratio by 2.7% (1.6%). The findings are economically and statistically significant at 1% level. In panel B, I exclude Australia and UK from the sample and find the results almost identical to the previous findings.

1.9. Conclusion

In an agency framework, the conflict between managers and debtholders intensifies when the capital structure deviates from the target. In DeMarzo (2019), firms adjust the leverage ratio dynamically to maintain commitment to the lenders. Firms can commit to lenders in several different ways. Placing higher collateral is viewed as an essential commitment mechanism that constrains the future capital structure choices. In this study, I highlight the role of tangible assets (collateral) as a commitment device in the setting of a dynamic capital structure. I argue that firms with higher tangible assets posit higher commitment to lenders that restrict firms from deviating far away from the target capital structure. The deviation above the target is viewed as riskier for firms; thus, it results in higher agency conflict between managers and bondholders.

As a natural commitment mechanism, higher tangible assets increase firms' speeds of adjustment towards leverage targets. I find that firms maintain this commitment, even though firms have deficit financing. As a test of commitment intensity, I analyze SOA when profitability is declining. The empirical findings validate the commitment of adjusting the leverage towards the target during the declining profitability. Oztekin and Flannery (2012) demonstrate how institutional heterogeneity fosters the speed of adjustment. In this study, I supplement their empirical findings by modeling commitment to the adjustment process. I find that the association is higher for firms situated in the weaker creditors' rights countries because of the firms' higher commitment to the lenders. The stronger effect for weak creditor countries remains when confined to the subsample of firms that are overleveraged. Lastly, I extend the analysis to see if greater commitment improves financially flexible firms' abilities to exploit investment opportunities. The results show that under-levered and more committed firms invest more in the next period. In this process, firms finance investment through new debt issuance, consistent with Dudley (2012).

To my knowledge, this study is the first to empirically investigate the commitment nature of the collateral. Future research may explore how the commitment value from tangible assets affects other financial policies, such as payout policies, firm performance, and so on. Further, as DeMarzo (2019) states, collateral is one of many commitment devices. Other devices, such as the effect of seniority provisions, restricted covenants, etc., on capital structure dynamics may also be worth investigating.

Figure 1.1. Tangible Assets and Leverage

This figure reports the mean of tangible assets scaled by total assets, book leverage ratio, market leverage ratio, long-term debt ratio, and short-term debt ratio from 1990 to 2018.

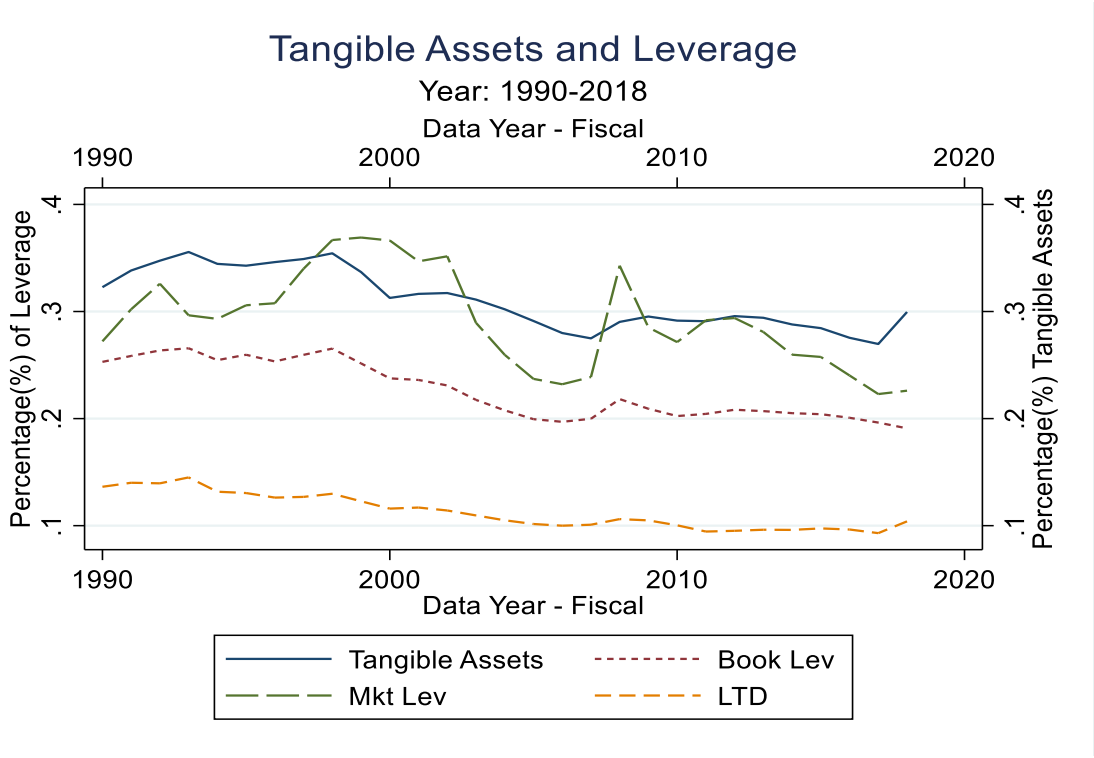


Table 1.1. Descriptive Statistics: By Country

This table presents the mean value of variables for each country. Book leverage is long-term debt plus short-term debt scaled by total assets. Market leverage is long-term debt plus short-term debt scaled by long term debt plus short-term debt plus market value. ROA is EBIT scaled by total assets. Tangible Assets are property, plant, and equipment scaled by total assets. MkttoBook is the ratio of market value over book value. RnD is R &D expenditure scaled by Sales. Altman Z score is 3.3*(EBIT/AT) +1.0 *(Sales/AT) +1.4* (RE/AT) +1.2*(WC/AT). CAPEX is capital expenditure scaled by total assets. Mean Ind. Lev is the 2-digit SIC industry mean book leverage. Creditors rights data is from Djankov et al. (2007). N represents the total number of firm-year for this sample country

	Book leverage	Market Leverage	Tangible Assets	ROA	Mkt to Book	RnD	Altman-z	CAPEX	Mean Ind. Lev	Creditor Rights	N
ARGENTINA	0.218	0.287	0.387	0.087	1.518	0.000	1.611	0.061	0.212	1	674
AUSTRALIA	0.128	0.140	0.342	-0.069	1.882	0.022	-1.071	0.071	0.130	3	16,763
BRAZIL	0.285	0.339	0.337	0.065	2.659	0.002	1.070	0.053	0.285	1	2,908
CHILE	0.240	0.220	0.431	0.054	2.986	0.000	1.261	0.056	0.240	2	1,559
COLOMBIA	0.147	0.252	0.448	0.055	1.140	0.000	4.621	0.042	0.152	0	308
EGYPT	0.177	0.214	0.390	0.078	1.356	0.000	1.461	0.041	0.179	2	10,90
FINLAND	0.241	0.313	0.275	0.058	1.469	0.028	1.843	0.055	0.243	1	1,717
FRANCE	0.210	0.314	0.184	0.045	1.430	0.018	1.392	0.041	0.213	0	9,018
GERMANY	0.189	0.265	0.231	0.027	1.518	0.023	1.468	0.043	0.189	3	10,294
HONGKONG	0.186	0.260	0.313	0.017	1.494	0.006	0.849	0.044	0.192	4	2,250
INDIA	0.234	0.307	0.314	0.101	2.025	0.005	1.947	0.061	0.286	2	1,452
INDONESIA	0.297	0.329	0.401	0.073	2.074	0.000	4.421	0.060	0.297	2	4,475
ISRAEL	0.256	0.293	0.203	0.024	2.115	0.050	0.551	0.035	0.250	3	3,084
ITALY	0.257	0.441	0.234	0.030	1.251	0.007	1.591	0.037	0.259	2	3,201
JAPAN	0.202	0.268	0.263	0.048	1.391	0.015	1.851	0.027	0.216	2	10,151
JORDAN	0.174	0.214	0.407	0.034	1.297	0.001	1.073	0.024	0.173	1	1,038
MALAYSIA	0.208	0.285	0.350	0.042	1.267	0.004	1.217	0.042	0.209	3	11,305
MEXICO	0.251	0.352	0.452	0.083	1.364	0.000	1.582	0.049	0.251	0	1,677
NETHERLANDS	0.219	0.259	0.260	0.065	1.612	0.015	1.780	0.049	0.219	3	2,481
NIGERIA	0.186	0.223	0.456	0.078	1.907	0.001	1.450	0.069	0.200	4	686
NORWAY	0.281	0.295	0.330	0.012	2.087	0.015	0.985	0.063	0.281	2	2,674
PAKISTAN	0.301	0.423	0.468	0.093	1.303	0.001	1.799	0.055	0.303	1	2,873
PERU	0.200	0.370	0.504	0.089	1.186	0.001	1.353	0.053	0.203	0	831
S KOREA	0.271	0.411	0.336	0.037	1.180	0.015	2.108	0.050	0.273	3	13,400
SINGAPORE	0.195	0.267	0.290	0.028	1.297	0.004	1.232	0.047	0.200	3	6,846
SOUTH AFRICA	0.155	0.199	0.330	0.099	1.563	0.003	2.122	0.059	0.159	3	2,739
SPAIN	0.267	0.367	0.321	0.053	1.472	0.006	1.123	0.035	0.267	2	2,120
SWEDEN	0.185	0.234	0.201	0.002	1.773	0.033	1.200	0.036	0.184	1	3,949
SWITZERLAND	0.213	0.263	0.306	0.049	1.613	0.030	1.520	0.043	0.213	1	3,244
THAILAND	0.257	0.296	0.390	0.058	1.450	0.000	1.510	0.054	0.258	2	7,344

TURKEY	0.215	0.252	0.329	0.049	1.746	0.005	1.317	0.043	0.214	4	3,001
UK	0.174	0.200	0.279	0.028	1.779	0.023	1.144	0.049	0.171	4	13,488
ZIMBABWE	0.143	0.269	0.439	0.135	1.209	0.001	1.727	0.072	0.146	4	32

Table 1.2. Summary Statistics

This table presents the descriptive statistics and the correlation matrix of the major variables used in the study. Book leverage is long term debt plus short-term debt scaled by total assets. Market leverage is long-term debt plus short-term debt scaled by long-term debt plus short-term debt plus market value. ROA is EBIT scaled by total assets. Tangible Assets are property, plant, and equipment scaled by total assets. MkttoBook is the ratio of market value over book value. RnD is R &D expenditure scaled by Sales. Altman Z score is 3.3*(EBIT/AT) +1.0 *(Sales/AT) +1.4* (RE/AT) +1.2*(WC/AT). The description of all the variables is in Appendix B.1.

Panel A: Descriptive Statistics

Variable Name	**Mean**	**Std. Dev**	**P1**	**P10**	**P25**	**P50**	**P75**	**P90**	**P99**	**N**
Total Assets (USD)	1478.502	7665.573	2.517	15.061	42.617	141.782	549.197	2229.324	27299.734	149,859
Book leverage	0.211	0.184	0.000	0.000	0.041	0.184	0.334	0.469	0.725	149,859
Market Leverage	0.276	0.268	0.000	0.000	0.031	0.203	0.454	0.694	0.959	149,859
Tangible Assets	0.309	0.232	0.002	0.031	0.112	0.272	0.460	0.649	0.905	149,859
Investment	0.048	0.056	0.000	0.000	0.009	0.029	0.065	0.122	0.250	149,859
ROA	0.031	0.134	-0.493	-0.103	0.004	0.051	0.099	0.157	0.253	149,859
MkttoBook	1.586	1.347	0.467	0.711	0.893	1.146	1.674	2.808	7.625	149,859
RnD	0.014	0.045	0.000	0.000	0.000	0.000	0.001	0.034	0.238	149,859
Altman Z	1.272	4.010	-8.578	-0.438	0.689	1.427	2.143	2.904	6.404	149,859
Mean Ind. Leverage	0.214	0.104	0.027	0.096	0.141	0.201	0.269	0.344	0.532	149,859
Creditor rights	2	1	0	1	2	3	3	4	4	149,859

Panel B: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) $\Delta BookLev_{i,t+1}$	1.000														
(2) $\Delta MktLev_{i,t+1}$	0.556	1.000													
(3) Size (USD)	-0.024	-0.001	1.000												
(4) Tangible Assets	-0.025	-0.018	0.107	1.000											
(5) ROA	-0.000	0.010	0.220	0.038	1.000										
(6) Mkt to Book	0.031	0.099	-0.107	-0.102	0.005	1.000									
(7) RnD/Sale	0.007	-0.004	-0.067	-0.194	-0.161	0.178	1.000								
(8) Altman Z	0.005	0.007	0.237	-0.040	0.762	-0.067	-0.161	1.000							
(9) Mean Ind. Leverage	-0.060	-0.033	0.198	0.246	0.078	-0.124	-0.170	0.063	1.000						
(10) GDP per capita/10000	-0.003	-0.001	0.128	-0.166	-0.127	-0.005	0.184	-0.098	-0.238	1.000					
(11) Enforceability of Law	0.012	-0.015	-0.194	0.007	0.028	0.100	-0.026	-0.021	0.035	-0.363	1.000				
(12) Rule of Law	0.002	0.009	0.096	-0.166	-0.135	0.008	0.176	-0.098	-0.270	0.814	-0.480	1.000			
(13) Governance Effective	0.003	0.007	0.062	-0.153	-0.118	0.008	0.159	-0.080	-0.345	0.730	-0.447	0.918	1.000		
(14) Creditors' Rights	0.012	0.015	-0.148	0.016	-0.055	0.045	0.032	-0.066	-0.180	0.028	-0.011	0.212	0.267	1.000	
(15) Stock Market Develop	0.031	0.043	-0.111	-0.082	-0.023	0.048	0.051	-0.030	-0.153	-0.011	0.176	-0.041	0.066	0.267	1.000

Table 1.3. Tangible Assets and SOA

Panel A of this table provides regression analysis of equation (1) where $DEV^{*}_{i,t+1} = Lev^{*}_{i,t+1} - Lev_{i,t}$. $Lev^{*}_{i,t+1}$ is the predicted leverage ratio using equation (2). The dependent variable is the actual change of book or market leverage, i.e., $\Delta BookLev_{i,t+1}$, $\Delta MKtLev_{i,t+1}$. Panel B provides the regression analysis of equation (3). $HighTangible$ is a dummy variable if tangible assets are above the industry median. BookLev is long-term debt plus short-term debt scaled by total assets MktLev is long-term debt plus short-term debt over long-term debt plus short-term debt plus market value. T-values are reported in parenthesis. Standard errors are bootstrapped standard errors. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) $\Delta BookLev_{i,t+1}$	(2) $\Delta MktLev_{i,t+1}$
Panel A: SOA		
$DEV^{*}_{i,t+1}$	**0.201*** **	**0.231*** **
	(54.204)	**(112.590)**
Constant	0.002***	0.004***
	(11.193)	(8.453)
Observations	149,859	149,475
R-squared	0.020	0.044
Std. Err.	Bootstrap	Bootstrap
Panel B: High Tangible Assets and SOA		
$DEV^{*}_{i,t+1}$	0.185***	0.216***
	(32.217)	(75.465)
$HighTangible$	-0.002***	0.001
	(-4.594)	(0.868)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible}$	**0.030*** **	**0.030*** **
	(5.105)	**(5.009)**
Constant	0.004***	0.004***
	(8.239)	(7.984)
Observations	149,859	149,475
R-squared	0.020	0.044
Std. Err.	Bootstrap	Bootstrap

Table 1.4. Tangible Assets, SOA, and Over-leverage

Panel A presents the regression results of the interaction effect of deviations, high tangible assets on change of leverage in the sub-sample of over-levered and under-levered firms. Panel B reports the regression results when firms are over-levered and have deficit financing or firms are over-levered and experienced declining profitability. Where $DEV^{*}_{i,t+1} = Lev^{*}_{i,t+1} - Lev_{i,t}$. $Lev^{*}_{i,t+1}$ is the predicted leverage ratio using equation (2). The dependent variable is the actual change of book or market leverage, i.e., $\Delta BookLev_{i,t+1}$ *and* $\Delta MKtLev_{i,t+1}$. Firms are $OverLevered$ if $Lev^{*}_{i,t+1} - Lev_{i,t} < 0$. Firms are $UnderLevered$ if $Lev^{*}_{i,t+1} - Lev_{i,t} > 0$. $HighTangible$ is a dummy variable if tangible assets are above the industry median value, 0 otherwise. Deficit financing is calculated as dividend plus investment plus the change of working capital minus cash flow (CF) scaled by total assets following Frank and Goyal (2009). Declining profitability is when firms' profitability is less than the previous year for the previous three consecutive years. T-values are reported in parenthesis. Standard errors are bootstrapped standard errors. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Panel A: High tangible assets and SOA of over-levered firms				
	Over-Levered Sample		Under-Levered Sample	
VARIABLES	$\Delta BookLev_{i,t+1}$	$\Delta MktLev_{i,t+1}$	$\Delta BookLev_{i,t+1}$	$\Delta MktLev_{i,t+1}$
$DEV^{*}_{i,t+1}$	0.143***	0.283***	0.155***	0.152***
	(10.078)	(27.654)	(12.507)	(15.174)
$HighTangible$	0.002*	0.002	-0.006***	0.002*
	(1.728)	(1.101)	(-6.281)	(1.668)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible}$	**0.072*** **	**0.043*** **	**0.072*** **	**0.001**
	(4.143)	**(3.910)**	**(5.249)**	**(0.087)**
Constant	-0.001	0.010***	0.005***	0.007***
	(-0.580)	(6.358)	(6.604)	(9.527)
Observations	58,815	59,822	72,091	70,777
R-squared	0.009	0.039	0.012	0.011
Std Err	Bootstrap	Bootstrap	Bootstrap	Bootstrap
Panel B: High tangible assets and SOA of over-levered and deficit financing (or declining profit) firms				
	Over-Levered and Deficit Financing Sample		Over-Levered and Declining Profitability Sample	
VARIABLES	$\Delta BookLev_{i,t+1}$	$\Delta MktLev_{i,t+1}$	$\Delta BookLev_{i,t+1}$	$\Delta MktLev_{i,t+1}$
$DEV^{*}_{i,t+1}$	0.113***	0.288***	0.093**	0.301***
	(9.732)	(21.363)	(2.316)	(9.258)
$HighTangible$	0.004***	0.004	0.005*	0.001
	(2.771)	(1.510)	(1.789)	(0.179)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible}$	**0.067*** **	**0.037** **	**0.110***	**-0.019**
	(4.130)	**(2.148)**	**(1.940)**	**(-0.354)**
Constant	0.001	0.017***	-0.003	0.014***
	(0.455)	(7.244)	(-1.018)	(3.668)
Observations	39,081	37,786	5,441	5,677
R-squared	0.007	0.042	0.008	0.037
Std Err	Bootstrap	Bootstrap	Bootstrap	Bootstrap

Table 1.5. Tangible assets, SOA, and Creditor Rights

Panel A presents the effect of high tangible assets on SOA for firms headquartered in weak or strong creditor rights countries. Panel B presents the effect of high tangible assets on SOA for over-levered firms headquartered in weak or strong creditor rights countries. The dependent variable is the actual change of book or market leverage, i.e., $\Delta BookLev_{i,t+1}$ *and* $\Delta MKtLev_{i,t+1}$. $HighTangible$ is a dummy variable if tangible assets are above the industry median value. Where $DEV^{*}_{i,t+1} = Lev^{*}_{i,t+1} - Lev_{i,t}$. $Lev^{*}_{i,t+1}$ is the predicted leverage ratio using equation (2). Weak creditor right is a sub-sample when the creditor rights index is 0, 1, or 2. Strong creditor rights are a sub-sample when the creditor rights index is 3 or 4. Creditor rights are derived from Djankov et al. (2007). T-values are reported in parenthesis. Standard errors are bootstrapped standard errors. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Panel A: High tangible assets, creditor rights, and SOA				
	Weak creditor rights		Strong creditor rights	
VARIABLES	$\Delta BookLev_{i,t+1}$	$\Delta MktLev_{i,t+1}$	$\Delta BookLev_{i,t+1}$	$\Delta MktLev_{i,t+1}$
$DEV^{*}_{i,t+1}$	0.159***	0.271***	0.418***	0.314***
	(29.542)	(35.491)	(34.723)	(48.402)
$HighTangible$	-0.001	0.001	0.001	0.005***
	(-0.604)	(0.508)	(1.174)	(3.230)
$\boldsymbol{HighTangible * DEV^{*}_{i,t+1}}$	**0.059*** **	**0.022** **	**-0.030*** **	**-0.002**
	(6.120)	**(2.001)**	**(-2.667)**	**(-0.164)**
Constant	0.009***	0.023***	-0.010***	-0.014***
	(13.641)	(35.831)	(-12.018)	(-15.723)
Observations	64,097	63,895	85,762	85,580
R-squared	0.020	0.056	0.037	0.054
Std. Err	Bootstrap	Bootstrap	Bootstrap	Bootstrap
Panel B: High tangible assets, creditor rights, and SOA for over-levered firms				
VARIABLES	Weak creditors right & Over-levered	Strong creditors right & Over-levered	Weak creditors right & Over-levered	Strong creditors right & Over-levered
	$\Delta BookLev_{i,t+1}$		$\Delta MktLev_{i,t+1}$	
$DEV^{*}_{i,t+1}$	0.210***	0.591***	0.338***	0.489***
	(14.202)	(14.162)	(24.221)	(19.831)
$HighTangible$	0.002	0.007***	0.003	0.009**
	(1.285)	(8.988)	(1.467)	(2.382)
$\boldsymbol{HighTangible * DEV^{*}_{i,t+1}}$	**0.078*** **	**-0.077**	**0.040** **	**-0.008**
	(3.358)	**(-1.327)**	**(1.987)**	**(-0.277)**
Constant	0.012***	-0.013***	0.033***	-0.013***
	(11.390)	(-16.882)	(16.761)	(-4.746)
Observations	37,063	21,752	36,990	22,832
R-squared	0.020	0.032	0.059	0.053
Std Err	Bootstrap	Bootstrap	Bootstrap	Bootstrap

Table 1.6. Tangible assets, SOA, and Low Creditors' Right: Each Component of Creditors' Rights

This table presents the SOA of firms headquartered in countries if each component of the creditor rights index is zero or one. In each of the sub-samples, the component of the creditor rights is zero in the first 4 columns and one in the last four columns. Where $DEV^{*}_{i,t+1} = Lev^{*}_{i,t+1} - Lev_{i,t}$. $Lev^{*}_{i,t+1}$ is the predicted leverage ratio using equation (2). The dependent variable is the actual change of book or market leverage, i.e., $\Delta BookLev_{i,t+1}$ and $\Delta MktLev_{i,t+1}$. $HighTangible$ is a dummy variable if tangible assets are above the industry median value, 0 otherwise. The components of creditor rights are MGMT_NOT_ STAY (which captures the ability of creditors or courts to replace the incumbent management during bankruptcy), NO_AUTOSTAY (which equals one if the bankruptcy code prohibits an automatic stay on assets) and RESTRICT_REORG (which equals one if the bankruptcy code prevents management from unilaterally filing a reorganization plan), and SECURED_FIRST (which equals one if secured creditors' claims are given absolute priority relative to government or employee claims). T-values are reported in parenthesis. Standard errors are bootstrapped standard errors. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) NO_AUTO STAY=0	(2) SECURED _FIRST=0	(3) RESTRICT _REORG=0	(4) MGMT_NOT _ STAY=0	(5) NO_AUTO STAY=1	(6) SECURED _FIRST=1	(7) RESTRICT _REORG=1	(8) MGMT_NOT _ STAY=1
Panel A: $\Delta BookLev_{i,t+1}$								
$DEV^{*}_{i,t+1}$	0.165***	0.374***	0.189***	0.169***	0.310***	0.282***	0.269***	0.268***
	(52.889)	(12.306)	(19.356)	(42.068)	(24.236)	(32.607)	(44.585)	(27.205)
$HighTangible$	-0.004***	-0.017***	-0.006***	-0.003***	0.003***	0.000	0.003***	0.001***
	(-7.815)	(-5.605)	(-9.335)	(-5.631)	(6.868)	(0.844)	(3.957)	(3.548)
$\boldsymbol{HighTangible} * DEV^{*}_{i,t+1}$	**0.020****	**-0.103*****	**0.027*****	**0.030*****	**-0.039*****	**-0.022****	**-0.040*****	**-0.019**
	(2.351)	**(-2.909)**	**(2.795)**	**(2.735)**	**(-2.910)**	**(-2.369)**	**(-3.623)**	**(-1.256)**
Constant	0.008***	0.041***	0.009***	0.008***	-0.005***	-0.001**	-0.003***	-0.003***
	(17.519)	(16.839)	(17.895)	(22.717)	(-8.050)	(-2.072)	(-5.039)	(-5.676)
Observations	67,413	14,838	67,764	66,896	81,345	133,829	80,985	81,862
R-squared	0.018	0.033	0.021	0.019	0.028	0.027	0.023	0.025
Std Err	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap
Panel B: $\Delta MktLev_{i,t+1}$								
$DEV^{*}_{i,t+1}$	0.209***	0.483***	0.208***	0.218***	0.290***	0.290***	0.295***	0.245***
	(38.630)	(25.020)	(41.335)	(53.905)	(35.124)	(52.883)	(30.623)	(41.384)
$HighTangible$	-0.003*	-0.014**	-0.006***	-0.000	0.009***	0.005***	0.009***	0.005***
	(-1.666)	(-2.390)	(-4.580)	(-0.307)	(6.758)	(11.697)	(10.435)	(5.252)
$\boldsymbol{HighTangible} * DEV^{*}_{i,t+1}$	**-0.008**	**-0.075****	**0.023****	**0.001**	**0.016**	**-0.006**	**-0.017***	**0.036*****
	(-1.137)	**(-2.378)**	**(2.471)**	**(0.156)**	**(1.431)**	**(-0.812)**	**(-1.774)**	**(5.118)**
Constant	0.007***	0.037***	0.008***	0.007***	-0.009***	-0.004***	-0.009***	-0.004***
	(19.732)	(26.242)	(19.805)	(12.324)	(-7.273)	(-9.157)	(-11.516)	(-5.650)
Observations	67,413	14,838	67,764	66,896	81,218	133,521	80,782	81,763
R-squared	0.020	0.036	0.023	0.021	0.054	0.054	0.052	0.048
Std Err	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap

Table 1.7. Endogeneity Tests

Panel A provides the regression analysis of equation (3) using the instrumental variable approach. $\widehat{High}_{tangible}$ is a dummy variable if the predicted values of tangible assets are above the industry median value. In the first stage, I take three instruments. The instruments are financial slack ($MNLPotBuy$), total M & A activity of the firms' industry ($TotM\&A$), and SIC 2 digit mean industry leverage. BookLev is long term debt plus short-term debt scaled by total assets. MktLev is long-term debt plus short-term debt scaled by long-term debt plus short-term debt plus the market value. Panel B reports the results with the propensity score matching approach. I matched the treated sample (high tangible assets firms) with the control sample (low tangible assets firms) using caliper 0.1%. T-values are reported in parenthesis. Standard errors are bootstrapped errors or heteroscedasticity and autocorrelation adjusted robust. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	First Stage	Second Stage	
VARIABLES		$\Delta BookLev_{i,t+1}$	$\Delta MktLev_{i,t+1}$
Panel A: Instrumental variable approach			
$DEV^{*}_{i,t+1}$		0.157***	0.192***
		(27.440)	(30.571)
$HighTangible$		-0.006***	-0.003***
		(-9.824)	(-2.650)
$\boldsymbol{DEV^{*}_{i,t+1} * \widehat{High}_{tangible}}$		**0.125*** **	**0.0745*** **
		(9.274)	**(9.012)**
$TOT\ M\&A$	0.009***		
	(14.171)		
$MNLPOTBUY$	-0.000		
	(-1.132)		
$MeanIndTang$	1.037***		
	(242.12)		
Constant	-0.058***	0.004***	0.003***
	(-14.193)	(12.610)	(4.105)
Observations	73,963	73,963	73,769
R-squared		0.021	0.041
Std. Err.		Bootstrap	Bootstrap
Hansen J Test	**0.103**		
	(0.950)		
Panel B: Propensity Score Matching			
$DEV^{*}_{i,t+1}$		0.203***	0.227***
		(23.700)	(31.600)
$HighTangible$		-0.005***	-0.003***
		(-5.878)	(-2.635)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible}$		**0.036*** **	**-0.015**
		(2.909)	**(-1.581)**
Constant		0.005***	0.006***
		(9.759)	(7.308)
Observations		59,051	58,925
R-squared		0.023	0.040

Table 1.8. Financial Flexibility, Tangible assets, and Investment

This table presents the panel regression for the Q-model of investment as specified in Eq. (4). The dependent variable is $TotInv$. $TotInv$ is the sum of CAPEX, R&D expense, and sells and general expenditure scaled by total assets. CF is the cash flow scaled by total assets. FF2 is the financial flexibility of a firm if a firm is under-levered for the previous two consecutive years. $TangibileAssets_{i,t-1}$ is property, plant and equipment (PPENT) scaled by total assets. $TobinQ$ is the market value plus total debt minus current debt scaled by gross PPENT following Andrei et al. (2019). Column 4 reports the 2nd stage of instrumental variable approach taking the following instruments: financial slack ($MNLPotBuy$), total M & A activity of the firms' industry ($TotM\&A$), and SIC 2 digit mean industry leverage. T-values are reported in parenthesis. Standard errors are robust standard errors or clustered at the firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

Dependent Variable	(1)	(2)	(3)	(4)
$TotInv_{i,t}$	Pooled regression	FE	FE	IV (2nd Stage)
$TotInv_{i,t-1}$	0.663***	0.268	0.653***	0.995***
	(3.041)	(1.419)	(2.889)	(62.115)
$CF_{i,t-1}$	0.007	-0.004	0.007	0.130***
	(1.070)	(-0.907)	(1.104)	(6.836)
$FF2$	0.127***	0.029	0.115***	-0.003
	(7.453)	(0.534)	(3.682)	(-1.082)
$FF2{*}CF_{i,t-1}$	-0.086***	-0.003	-0.084***	-0.057**
	(-3.386)	(-0.099)	(-2.621)	(-2.425)
$TangibleAssets_{i,t-1}$	-0.035***	-0.052	-0.011	
	(-6.681)	(-1.471)	(-0.433)	
$\boldsymbol{Tangibile_{Assets_{i,t-1}}{*}FF2}$	**0.019****	**0.051*****	**0.021****	
	(2.536)	**(4.000)**	**(2.270)**	
$\widehat{Tangible}_{Assets_{i,t-1}}$				-0.022***
				(-2.711)
$\widehat{Tangible}_{Assets_{i,t-1}}{*}FF2$				**0.040*****
				(3.891)
$TobinQ$	0.001*	0.000	0.000	0.000***
	(1.799)	(0.731)	(1.382)	(3.156)
Constant	0.092*	0.114***	0.055*	0.002
	(1.768)	(5.883)	(1.753)	(0.272)
Observations	90,975	90,975	90,910	45,505
Adjusted R-squared	0.592	0.835	0.598	0.894
Year FE	NO	YES	YES	YES
Ind. FE	NO	NO	YES	YES
Firm FE	NO	YES	NO	NO
Cluster	No	Firm-Level	Firm-Level	Firm-Level
Instruments				
$TOT\ M\&A$				0.009***
				(14.171)
$MNLPOTBUY$				-0.000
				(-1.132)
$MeanIndTang$				1.037***
				(242.12)
Hansen J Test				**0.103**
				(0.950)

Table 1.9. Equity Issue or Debt Issue When Firms Have the Financial Flexibility and High Tangible Assets

This table presents the regression coefficient of financial flexibility on debt or equity issue in a subsample of high tangible assets at the beginning of the period using probit regression model. Following Hovakimian, Opler, and Titman (2001), the equity issue is 1 if the sale of common stock minus purchase of common stock scaled by total assets is greater than 5%, 0 otherwise. Following Frank and Goyal (2003), the debt issue is a dummy 1 if $Book\ Debt_t$ minus $Book\ Debt_{t-1}$ scaled by total assets > 5%, 0 otherwise. $HighTangible$ is a dummy variable of 1 if tangible assets are higher than the industry median value. FF2 measures the financial flexibility of a firm if firms are under-levered for the previous two consecutive two years. $TargetD/A$ is the target leverage ratio predicted after equation (2). $Industry\ MeanD/A$ is the mean leverage of Fama and French 49 industry. $MkttoBook$ is the market to book ratio. ROA is the return on asset. Short-term debt ratio is the leverage due within 1 year. Standard errors are heteroscedasticity adjusted robust (Huber-White estimators). T values are in parenthesis. The marginal effects of the coefficients are in the square brackets. ***, **, and * indicate that the coefficients are statistically significant at %, 5%, and 10% levels, respectively.

VARIABLES	(1) *Equity Issue*	(2) *Debt Issue*
FF2	**-0.170*** **	**0.243*** **
	(-3.746)	**(4.621)**
	[-0.022]	[0.04]
TargetD/A- Industry MeanD/A	0.347***	-0.438***
	(2.704)	(-2.850)
IndustryMeanD/A -Actual D/A	-0.182	-1.411***
	(-0.992)	(-6.077)
MkttoBook	0.001	0.019
	(0.092)	(0.940)
MkttoBook>1 dummy	0.252***	-0.253***
	(6.207)	(-4.952)
ROA	-1.886***	1.239***
	(-4.268)	(2.586)
Short-term debt ratio	-1.406***	2.553***
	(-6.610)	(10.166)
Constant	-1.066***	2.222***
	(-3.100)	(10.191)
Observations	12,521	7,340
Psuedo R-squared	0.046	0.244
Year FE	YES	YES

Table 1.10. Robustness Test: Tangible Assets and SOA (with US sample)

This table provides regression analysis of equation (3), including US sample with the global sample. Where $DEV^{*}_{i,t+1} = Lev^{*}_{i,t+1} - Lev_{i,t}$. $Lev^{*}_{i,t+1}$ is the predicted leverage ratio using equation (2). The dependent variable is the actual change of book or market leverage, i.e., $\Delta BookLev_{i,t+1}$ *and* $\Delta MKtLev_{i,t+1}$. $HighTangible$ is a dummy variable if tangible assets are above the industry median, 0 otherwise. Panel A reports the results when I include US samples with the global sample. Panel B reports results from only US firms. T-values are reported in parenthesis. Standard errors are bootstrapped standard errors. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) $\Delta BookLev_{i,t+1}$	(2) $\Delta MktLev_{i,t+1}$
Panel A: US and global sample		
$DEV^{*}_{i,t+1}$	0.167***	0.165***
	(29.582)	(81.117)
$HighTangible$	-0.005***	0.000
	(-11.553)	(0.006)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible_{i,t}}$	**0.033*** **	**0.030*** **
	(5.883)	**(7.062)**
Constant	0.006***	0.007***
	(27.966)	(21.009)
Observations	276,192	275,817
R-squared	0.016	0.030
Std. Err.	Bootstrap	Bootstrap
Panel B: Only US Sample		
$DEV^{*}_{i,t+1}$	0.468***	0.373***
	(34.041)	(49.789)
$HighTangible$	-0.006***	-0.001
	(-10.963)	(-1.174)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible_{i,t}}$	**0.068*** **	**0.114*** **
	(3.301)	**(9.912)**
Constant	0.011***	0.002***
	(27.806)	(4.212)
Observations	129,546	129,268
R-squared	0.041	0.060
	Bootstrap	Bootstrap

Table 1.11. Robustness Test: Tangible Assets and SOA (without the US, Australia, and the UK)

This table provides regression analysis of equation (3), excluding the countries with the highest observations. Where $DEV^{*}_{i,t+1} = Lev^{*}_{i,t+1} - Lev_{i,t}$. $Lev^{*}_{i,t+1}$ is the predicted leverage ratio using equation (2). The dependent variable is the actual change of book or market leverage, i.e., $\Delta BookLev_{i,t+1}$, $\Delta MKtLev_{i,t+1}$. The sample is now reduced without considering firms from the US, Australia, and the UK. $HighTangible$ is a dummy variable if tangible assets are above the industry median value. Panel A reports results when I exclude the sample from the dominating countries, i.e., the US, Australia, and the UK. Panel B reports results when I exclude only Australia and the UK from the analysis. T-values are reported in parenthesis. Standard errors are bootstrapped standard errors. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) $\Delta BookLev_{i,t+1}$	(2) $\Delta MktLev_{i,t+1}$
Panel A: Without US, Australia, and the UK sample		
$DEV^{*}_{i,t+1}$	0.090***	0.161***
	(30.903)	(47.135)
$HighTangible$	-0.004***	-0.001
	(-10.841)	(-1.201)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible_{i,t}}$	**0.027*** **	**0.016*** **
	(6.890)	**(4.234)**
Constant	0.005***	0.014***
	(11.276)	(29.948)
Observations	116,761	116,709
R-squared	0.010	0.030
Std. Err.	Bootstrap	Bootstrap
Panel A: Without Australia and the UK sample		
$DEV^{*}_{i,t+1}$	0.182***	0.198***
	(42.287)	(62.861)
$HighTangible$	-0.005***	0.000
	(-9.770)	(0.010)
$\boldsymbol{DEV^{*}_{i,t+1} * HighTangible_{i,t}}$	**0.041*** **	**0.031*** **
	(6.179)	**(7.567)**
Constant	0.008***	0.011***
	(22.858)	(24.585)
Observations	246,307	245,977
R-squared	0.018	0.036
Std. Err.	Bootstrap	Bootstrap

CHAPTER II

SOCIAL TRUST AND CAPITAL STRUCTURE: EVIDENCE FROM INTERNATIONAL DATA

Introduction

Social trust is a key component of economic success in society (Arrow, 1972; Coleman, 1990; Putnam, 1993; Fukuyama, 1995; among others).[27] A growing stream of research is focused on the role of social trust in corporate finance, for example trust and financing cost (Duarte, Siegel, & Young, 2012; Gupta, Raman, & Shang, 2018; Hasan et al., 2017; Meng & Yin, 2019), economic development (Fukuyama, 1995), cash holdings decision (Dudley & Zhang, 2016), bilateral trade (Guiso, Sapienza, & Zingales, 2009), financial development (Guiso, Sapienza, & Zingales, 2004), peer-to-peer lending (Duarte et al., 2012), venture capital activity (Bottazzi, Da Rin, & Hellman, 2016), and cross-border acquisition (Ahern, Daminelli, & Fracassi, 2015).

This study attempts to contribute to the growing literature by analyzing the importance of social trust on the capital structure decision for firms globally. Though the literature of social trust in corporate finance is not insubstantial, few studies examine the potential association between social trust and corporate capital structure. In a recent paper, Hasan et al. (2017) show that U.S. firms

[27] Social trust is an important component of social capital. Social capital refers to certain norms and values that permit cooperation among individuals in a society (Fukuyama, 1995). In this study, I use social trust and social capital interchangeably.

headquartered in high social trust environments enjoy lower credit spreads. In another study using global data, Meng and Yin (2019) find that the cost of debt is cheaper in high trust countries. Gupta, Raman, and Shang (2018) examine the effect of social trust on the cost of equity for U.S. firms and find a negative association. None of these studies considers the effect on capital structure policy. Given that both equity and debt costs benefit from social trust impacts, it is not clear what the net impact will be on capital structure policy. Thus, an analysis of the resulting impact on capital structure policy is a relevant undertaking and exciting addition to the existing literature.

The potential impact of social trust on financial policy can be evaluated from the perspective of agency and information asymmetry theories of capital structure. In the agency problem framework, conflicts between managers and shareholders on the one hand and between shareholders and debtholders on the other hand are different due to the heterogeneous rights of the parties (shareholders and debtholders) on the cash flow of the firm. To mitigate the former agency problem, shareholders nominate representation on the board to oversee the activities of the agents. However, in the latter case, monitoring by bondholders is not as direct as in the case of shareholders, relying largely on the firm's promise to abide by certain covenants. Consequently, the cost of debt varies by the easiness of monitoring, the riskiness of the borrowers, and the mutual relationship between debtors and creditors. Existing social science studies state that cooperative norms are nonreligious social values that limit the opportunistic behavior in a transaction (Coleman, 1988). In a community with strong social trust, individuals view opportunistic behavior as the contradiction to the established values of society. In line with this argument, debtholders perceive social trust as constraining the firms' opportunistic behaviors in debt financing. Thus, the cost of monitoring is cheaper if a high level of mutual trust prevails in society. This reduced cost induces a rational manager to issue more debt financing over equity financing as the cost of issuing debt is cheaper in two ways — lower information asymmetry of issuing debt and lower monitoring cost.

Prior literature emphasizes both the benefits and the costs of leverage financing. On the one hand, leverage leads firms to be more disciplined by committing them to pay loan payments

regularly, strengthening management oversight through credit monitoring (Harris & Raviv, 1990) and reducing managerial entrenchment through the associated risk of financial distress (Hennessy & Livdan, 2009). On the other hand, issuing excessive leverage drives firms to financial distress and increases tension between shareholders and creditors at the same time. By issuing short-term debt, firms try to reduce this conflict. Short-term debt binds issuers with a short-term commitment to repay that reduces management expropriation of wealth from bondholders (Harris & Raviv, 1990). I argue that firms located in higher social trust environments enjoy reduced costs of monitoring from bondholders because of the constrained opportunistic behavior by debt issuers. Thus, issuing short-term debt is redundant. Moreover, debt is cheaper in high trust countries (Hasan et al., 2017; Meng & Yin, 2019), and issuing debt has less information asymmetry. Thus, managers may be motivated to favor more long-term debt financing with lower cost and lower information asymmetry.

Based on the foregoing, I hypothesize that social trust differentials can systematically affect capital structure choice. my primary hypothesis is that higher social trust results in a higher leverage ratio in capital structures. The intuition behind the hypothesis, as discussed above, is that reduced contracting cost of debt makes it relatively cheaper. Thus, a rational manager will favor debt to equity financing, holding all else constant. I also look at several additional hypotheses. I hypothesize that social trust plays a complement to weak governance, low financial development, and weak creditors' rights in a country. In a trust intensive society, the mutual understanding between borrowers and lenders can potentially overshadow other country-level institutional traits such as weak governance, low financial development, and weak creditor protections. I hypothesize that the association between trust and long-term leverage is more prominent if countries have weak governance, weak creditors' rights, and low financial development. Lastly, I hypothesize that social trust may mediate certain firm-level determinants of capital structure ratio, such as tangible assets, profitability, growth opportunity, and financial distress.

I test the hypotheses using firm-year panel data from 32 countries globally over the years 1990 to 2018. I measure social trust using survey data from the World Value Survey (WVS). More specifically, social trust is the proportion of respondents who trust most of the people in the society (Guiso, Sapienza, & Zingales, 2004; Pevzner, Xie, & Xin, 2015; Meng & Yin, 2019). I start the investigation with a macro-level funds-flow analysis to determine which source of external financing effectively flows to the firms in a trust intensive society. The intuition behind this is to explore the country-level funds' appropriation to firms by sorting social trust from the lowest to the highest tercile. The preliminary inquiry finds that at the aggregate economy level, long-term debt issued by firms increases with the economy's social trust. Having established that the main thesis holds at the economy level, I explore the hypotheses at the firm-level using panel regressions. The results show that social trust is positively related to long-term debt ratio. I find that if social trust increases from 25^{th} percentile to 75^{th} percentile (1-IQR change), the long-term debt ratio increases by 7.73% relative to the sample mean leverage of 10.5%. The result is both economically and statistically significant at the 1% level. In all the statistical tests, I take various treatments of firm and year fixed effects with clustered standard deviations and find the results are robust.

Next, I explore how heterogeneous institutional environments contribute differently to the association between social trust and capital structure. Theories of market frictions (Hart & Moore, 1994; Holmstrom & Tirole, 1997) suggest that the presence of market friction (such as weak governance quality, weak creditors' rights, and low financial development) reduces the accessibility of external financing, especially debt financing. It is conceivable that social trust can ameliorate some of these institutional elements that affect capital structure. More specifically, I investigate the effect of social trust in countries with heterogeneous governance quality, creditors' rights, and financial development. First, I analyze the impact of social trust on capital structure across countries that vary in their overall governance quality. Cheng and Shiu (2007) find that firms located in better-governing countries use more leverage than those of weaker governing countries. I argue that trust acts as an intermediating factor between firms and lenders that compensates for

governance quality inherent at the country-level. The empirical evidence supports such a view, i.e., the interaction between trust and poor governance associates positively with the long-term debt ratio. Second, Djankov, McLiesh, and Shleifer (2007) find that the existence of creditors' rights promotes private credit. I argue that trust in society increases confidence between bondholders and issuers, which can minimize the impact of low creditors' rights and encourage more leverage financing. I find consistent evidence, i.e., the association of trust and long-term debt ratio is higher in low creditors' rights countries. Finally, I also analyze how trust influences capital structure when the financial development of a country is weak. Extant literature supports the importance of financial development in promoting debt financing (Qian & Strahan, 2007; Liberti & Mian, 2010). I find that the sensitivity of social trust on leverage is stronger if the financial development of a country is weak.

Next, I extend the investigation to show how trust interacts with key firm-level variables in moderating their impact on capital structure policy. I consider the following fundamental variables: tangible assets, profitability, growth opportunity, and financial distress. The argument is that trust can mitigate some of the underlying risk factors for which fundamental variables proxy. For example, tangible assets are positively associated with firm leverage, presumably because they provide some degree of assurance of where funds are being invested and potential for recovery in the event of failure. In a high trust environment, creditors may not rely as much on tangible assets to ensure their interests; therefore, I expect tangible assets to be less sensitive to debt financing in high trust economies compared to low trust economies. Empirical studies find a negative association between profitability and leverage, perhaps due to passive internal funds accumulation by profitable firms. According to the Pecking Order Theory, using internal funds reduces the adverse selection problem. In a trust intensive society, the problem of adverse selection is less acute; thus, social trust moderates the negative association between profitability and leverage. Prior evidence shows that growth (market-to-book) firms are associated with lower debt ratios, possibly due to higher agency costs as these firms have a tendency to invest sub optimally (Titman &

Wessels, 1988). A high trust environment may ameliorate concerns over information asymmetry, thereby implying a less negative effect of growth on debt ratio. Extant evidence also shows that greater earnings volatility and financial distress (Altman's Z-score) are associated with a lower debt ratio. Higher volatility and distress imply a greater potential for agency costs for debt. In a high trust environment, creditors may not view these costs to be as significant. Thus, the sensitivity of earnings volatility and financial distress to debt financing may be less negative in high trust environments relative to low trust environments.

Endogeneity issues are a common concern in most corporate finance research investigations. Given that the concern about social trust at the country level, and that firms do not, or at least are highly unlikely, to choose their domicile based on social trust, I can generally assume that social trust is exogenous to the firm. Nonetheless, I accommodate concerns over endogeneity by two methods. First, I use an instrumental variables (IV) approach by taking rainfall variation as an instrument of social trust. As an alternative method, I use propensity score matching to identify the sample and handle causal inferences, if any.[28] I obtain results that are robust. The details of the instrumental variable approach and propensity score matching is discussed in Section 2.6. However, another issue with using multi-country data is whether the results are mainly due to other country-level factors. Since trust is a very sticky measure, variation of social trust in every year in a country is rare. This fact raises a concern of spurious association between trust and leverage as other country-level factors may drive the association. To overcome this problem, I control for other firm-level and country-level factors along with Hofstede's cultural variables and find the association of social trust and leverage holds. Finally, as an additional measure to ensure that the results are not spurious, I study the association between large changes in trust and changes in following leverage ratios (Adhikari & Agarwal, 2016). I find that a five years' large change in social trust is associated positively with a five-year change of long-term debt ratio, while a five

[28] In some extreme scenarios, if firms' headquarter locations are endogenously chosen, then social trust could be endogenous. To mitigate the problem, I use the propensity score matched technique.

years small change is associated negatively. The results offer robust evidence of a positive association between trust and long-term leverage ratio.

To my best knowledge, this study is the first to offer a comprehensive evaluation of how trust influences the formation of capital structure in different institutional settings. The study by Huang and Shang (2019) is the closest to this study, analyzing the effects of U.S. state-level social capital on leverage. They find a negative association between social capital and total book (market) leverage. However, I find the opposite association between social trust and long-term leverage. There are several possible reasons why results differ from Huang and Shang (2019). First, they analyze the effect of social capital and leverage ratio for U.S. firms while this study involves global data. Since social trust is likely to vary across countries more so than across regions within a country, the analysis of global data adds deeper insight to the existing literature.

Secondly, methodological differences may account for the different findings. Huang and Shang (2019) use the Putnam index primarily as a measure of social capital, which is a comprehensive measure of social capital, and the measure is also static with no time variation.[29] I use the survey data of WVS, which has several waves.[30] Thus, the variable of interest, trust, has little time variation. Third, Huang and Shang (2019) do not consider the independent effect of long-term debt ratio in their analysis. In their study, they consider short-term debt, book leverage, and market leverage. The latter two measures, while incorporating long-term debt, also include short-term debt. Thus, their results may reflect the effect of short-term debt and not the long-term debt. Leverage, especially short-term leverage, helps managers to be disciplined as shorter maturity forces firms to repay loans and renegotiate with issuers on a more frequent basis, which fosters improved monitoring (Harris & Raviv, 1990). Since social trust constrains opportunistic behavior and reduces self-dealing (Cline & Williamson, 2016), firms no longer need to issue short-term debt to monitor

[29] They also use the Rupasingha, Goetz, and Freshwater (2006) measure of social capital, which has time variation.
[30] There are six waves start from the year 1981 to 2014. Each wave corresponds to a separate survey.

managers. Rather, firms could issue long-term debt, which may be the cheaper alternative and has fewer liquidity consequences. Hence, I consider the long-term debt ratio as a measure of leverage; moreover, Demirgüc-Kunt and Maksimovic (1999) and Booth et al. (2001) also use long-term debt ratio in their research. Further, Barclay and Smith (1995) and Johnson (2003) state that long-term debt is a main driver of total leverage ratio. Lastly, the study offers more comprehensive analyses with robust evidence when I consider both U.S. and global data. I also consider the large change effect on trust and its impact on the leverage and find the results robust. Thus, in methodological viewpoints, this study offers a more granular analysis of how trust affects firms' capital structure decisions.

The paper is organized as follows. Section 2.2 surveys the existing literature, and Section 2.3 develops the hypotheses. The data and sample statistics are presented in Section 2.4, followed by the empirical findings with analysis in Section 2.5. Section 2.6 presents endogeneity and other robustness tests. Finally, I conclude in Section 2.7.

2.2. Literature Review

Rajan and Zingales (1995) were among the first to emphasize the importance of understanding capital structure differences across countries. Their motivation was to see how well traditional theories based on fundamental variables to characterized firms' leverage differences across countries. One of the implications of their study is the potentially important role that institutional differences may play in explaining capital structure choice. Gungoraydinoglu and Öztekin (2011), for example, find that country-level factors explain one-third of the variation in firm debt ratios. In another study, De Jong, Kabir, and Nguyen (2008) find that firm-specific factors vary from country to country, and country-specific factors indirectly influence the roles of firm-specific factors of the leverage ratio. Relatedly, there has been an increasing research focus on nonfundamental attributes such as cultural or social factors as determinants of firm capital structure policy. Chui, Lloyd, and Kwok (2002) find that countries with high scores of social-cultural dimensions of "conservatism"

and “mastery” possess less leverage in capital structures. They argue that country-level cultural dimensions have implications for agency problems and moral hazard, which in turn can influence capital structure preferences across countries.

Social trust, a vital country-level factor, is also studied heavily in the finance literature in many contexts. Social trust helps to develop informal institutions, which can create unwritten communications and enforce unofficial sanctioned channels (Helmke & Levitsky 2004). According to Dudley and Zhang (2016), social trust can be defined as a set of beliefs for a group of firms and organizations. In other words, trust is the value in an overall society regarding how much its people feel they can rely on each other. Relevant to this study are two areas of the social trust literature, which I summarize next: (1) its relation to macro-economic development, and (2) its impact on the cost of capital.

2.2.1. Social Trust and Macro-Economic Development

Various researchers discuss social trust that affects various macro-economic variables. Fukuyama (1995, p. 10) states that “…. Social trust can be defined as the existence of a certain set of informal values or norms shared among members that permit cooperation among them.” He hypothesizes that social trust fosters efficiency on a large scale and finds supporting results. This hypothesis is verified by La Porta et al. (1996), who find that trust promotes cooperation, large organizations, and efficiency in government. In another study, Guiso et al. (2004) find that in an environment of high social trust, people invest less in cash and more in stock, use more checks, and have higher access to institutional credit. The results are more robust even in an environment of poor governance and less educated countries. Trust is also shown to facilitate bilateral trade between countries (Guiso et al., 2009). Den Butter and Mosch (2003) find that increasing trust by one standard deviation increases bilateral trade between the countries by 150%. During the

COVID-19 crisis period, firms located in higher social trust U.S. states associate with better performance (Mazumder, 2020).

2.2.2. Trust and the Cost of Capital

More related to corporate finance, several researchers study the impact of social capital on the cost of capital. In a study of U.S. firms, Gupta et al. (2018) find that the association of social capital and cost of equity is inversely related. They add that this specific relationship may be due to the effect of social monitoring channels through social trust. As a consequence, higher managerial credibility in high trust societies increases firm value and decreases the cost of equity. Hasan et al. (2017) and Meng and Yin (2019) examine whether social trust impacts the cost of debt. They also find evidence that social trust reduces the cost of debt. The findings are more robust when the countries have poor governance or during the period of a financial crisis.

2.3. Hypothesis Development

This section is organized into three parts. In the first part, I develop the core hypothesis on social trust as a determinant of capital structure policy. In the second part, I generate several hypotheses on the moderating role of trust on institutional environment impacts on capital structure choice. In the final part, I present several hypotheses on how social trust may interact with the impact of certain traditional firm fundamental determinants of leverage choice.

2.3.1. Trust and Capital Structure Choice

Social trust plays a vital role in ensuring reduced agency costs, which increases investors' confidence in agents and their proclivity to engage in opportunistic behavior. More precisely, higher social trust reduces self-serving behavior by agents (Gupta et al., 2018) as well as decreasing value expropriation in favor of equity holders (Hasan et al., 2017). In an agency theory framework, corporations are beset with conflicts between managers and shareholders and also between

debtholders and shareholders. To minimize the former agency cost, shareholders appoint a board of directors to directly monitor the activities of agents (Fama, 1980). In the latter, managers are presumed to engage in wealth expropriation in favor of shareholders at the expense of bondholders. To protect their interests, creditors to resort to covenants to constrain management behavior. However, firms' compliance with the covenants requires monitoring by debtholders (Leland and Pyle, 1977). Thus, the cost of debt varies with the ease of monitoring. I argue that social trust mitigates information asymmetry and acts as intangible collateral (Karlan et al., 2009). Thus, creditors located in high trust countries require less monitoring of debtors, which reduces the cost of debt and also increases the supply of debt. Social trust reduces incentive conflicts between the parties and induces creditors to extend favorable terms. This leads to the first hypothesis that rational managers will issue more long-term debt in high trustworthy societies.

H1: The higher a country's trustworthiness, the more the use of long-term debt in the capital structure of firms.

2.3.2. Trust, Institutional Differences, and Capital Structure Choice

Here I explore the potential mediating role of social trust on institutional environment traits that extant literature shows to affect corporate debt structure. Informal and formal institutions play vital roles in a number of spheres, including economic development (Law & Azman-Saini, 2012), capital market development (Guiso et al., 2004; La Porta et al., 1998), determining the cost of debt (Duarte et al., 2012), stock market performance (Core, Guay, & Rusticus, 2006), firm performance (Anderson & Gupta, 2009), and capital structure decisions (Guiso et al., 2004). In a trust intensive society, the mutual understanding between borrowers and lenders can potentially complement other country-level institutional traits such as governance, financial development, and creditors' protections. I hypothesize that the association between trust and long-term leverage is more

prominent if countries have weak governance, weak creditors' rights, and low financial development.

Trust and Governance: Countries' governance, such as the judicial system, anti-corruption efforts, voting rights, accountability, and political stability improves countries' economic development (La Porta et al., 1996). Considerable evidence shows that country-level governance variables are important determinants of firm policies along with risk-taking by firms (John, Litov, & Yeung, 2008). Prior studies find the choice of capital structure is contingent on a country's legal environment. Firms in stronger formal institutional environments use more financial leverage (Cheng & Shiu, 2007). I suggest that social trust can substitute for governance in countries with weak governance. Thus, even though firms are located in poorly governed countries, high social trust can serve as a mediating factor and fosters more debt financing. Consistent with this perception, I hypothesize that social trust associates more positively with the long-term debt ratio if firms are located in poorly governed countries.

H2. Social trust is more positively associated with long-term debt if country governance is weak.

Trust and Creditors' Rights: Stronger creditors' rights offer higher protection to creditors and encourages debt financing. Economies with better creditor protections demonstrate higher private credit to countries' GDP ratio (Djankov et al., 2007) and market development (La Porta et al., 1996). Creditors' rights can be defined as how easily lenders can force repayment, liquidate collateral, or take control of distressed firms. Thus, stronger creditors' rights ensure a higher level of monitoring by debtors. In the supply-side view, creditors' rights have a positive effect on firms' use of debt (La Porta et al., 1998). According to this view, better legal protections enable financiers to provide capital to entrepreneurs with reasonable conditions, and this enhances external financing for firms. I argue that social trust has an intermediating role. If creditors' rights are lacking, then

social trust can facilitate more debt financing because of the implied understanding between parties. Thus, the association between social trust is stronger for firms located in weak creditors' rights environments.

H3: Social trust is more positively associated with long-term debt in countries where creditor protection is low.

Trust and Financial Development: It is well-established that a country's financial development is associated positively with its growth (De Gregorio & Guidotti, 1995). The institutions that promote financial development also ease lending and borrowing constraints and eventually decrease the cost of debt (Qian & Strahan, 2007; Liberti & Mian, 2010). Extant literature argues in support of financial development that plays a crucial part in industrial and firm growth (Demirguc-Kunt & Maksimovic, 1998; Rajan & Zingales, 1998). From the earlier discussion, I am also aware of the positive influence of social trust on financial development and markets. In the next hypothesis, I explore the interaction between the two on firm financial leverage. Financial development and social trust may complement each other or, as I suggest, could substitute for each other. In one study, Putnam (1993) finds that people possess less cash and invest more in stock, use more checks, have higher access to credit, and make less informal loans in high trust-worthy countries. Hence, one can argue that trust fosters financial development. However, another study by Guiso, Sapienza, and Zingales (2004) finds that the effect of trust on financial development is stronger if a country's legal enforcement is weaker and if the country has less educated people. Even though existing literature finds that higher social trust results in improved financial development on average, I argue that where financial development is lacking, high social trust can play a more prominent and positive role in promoting firm leverage use. Hence, I hypothesize that the association between trust and leverage is stronger when financial development is weak.

H4: Social trust is more positively associated with long-term debt in countries where financial development is weak.

2.3.3. Trust and Firm-Level Factors

In the final set of hypotheses, I examine how trust interacts with key firm-level variables in moderating their impact on capital structure policy. I consider the following fundamental variables: tangible assets, profitability, growth opportunity, and financial distress, all of which are considered to be first-order determinants of firm capital structure (Titman & Wessels, 1988; Rajan & Zingales, 1995; Guedes & Opler, 1996; Frank & Goyal, 2009; Öztekin, 2015). The argument is that trust can mitigate some of the underlying risk factors for which fundamental variables proxy. It is conceivable that social trust could be viewed by investors and firms as a significant intangible asset that can moderate the effects of firm-level factors deemed important by investors and firms as determining elements of appropriate leverage policy. First, I consider tangible assets, a key determinant of corporate capital structure policy. Tangible assets are positively associated with firm leverage, presumably because as a form of collateral, they provide some degree of assurance of where funds are being invested and potentially available for recovery in the event of failure. Tangible assets also serve as a monitoring device (Rajan & Winton, 1995). In a high trust environment, creditors may not rely as much on tangible assets to ensure their interests; therefore, I expect tangible assets to be less sensitive to debt financing in high trust economies compared to low trust economies. I hypothesize that social trust is less positively associated with leverage if firms possess more tangible assets.

H5: Leverage is less positively associated with tangible assets in countries with higher social trust.

Profitability has been shown to be negatively associated with debt (Titman & Wessels, 1988; Frank & Goyal, 2009) because profitable firms accumulate internal funds to finance from an

internal source rather than debt (Myers & Majluf, 1984). In other words, the negative association between profitability and leverage is due to the passive accumulation of internal funds by profitable firms (Kayhan & Titman, 2007). The negative association is consistent with the Pecking Order Theory of capital structure because internally generated funds involve fewer adverse selection problems as well as less asymmetric information. I argue that social trust mitigates the adverse selection problem between lenders and borrowers, thus moderating the negative association between profitability and leverage.

H6: Leverage is less negatively associated with profitability in countries with higher social trust.

Prior evidence shows that growth (market-to-book) firms are associated with lower debt ratio (Rajan & Zingales, 1995; Öztekin, 2015; among others), possibly due to higher agency costs (Titman & Wessels, 1988). The theory predicts that firms with a higher market-to-book ratio may associate with higher financial distress costs and therefore a negative association with leverage. Moreover, high-growth firms are exposed to a greater debt overhang problem; thus, I expect leverage to be negatively associated with market-to-book ratio (Graham & Leary, 2011). I argue that a high trust environment may ameliorate concerns over information asymmetry, thereby implying a less negative effect of growth on the debt ratio.

H7: Leverage is less negatively associated with growth opportunities in countries with higher social trust.

Extant evidence also shows that higher financial distress is associated with lower debt ratio (Graham & Leary, 2011). Higher financial distress implies a greater potential for agency costs for debt (Timan & Wessels, 1988). This may reflect higher direct and indirect costs of bankruptcy associated with these firms, including greater potential for agency costs for debt. In a high trust

environment, creditors may not view these costs to be as significant. Thus, the sensitivity of social trust on leverage is higher if firms have higher financial distress.

H8: Leverage is less negatively associated with financial distress in countries with higher social trust.

2.4. Data and Sample Description

2.4.1. Data

Firm-level sample data is the outcome of combining different databases. I collected firm-level accounting and stock price data for global firms from COMPUSTAT global.[31] The COMPUSTAT Global database reports over 24,000 firms and begins at the year 1988. The COMPUSTAT Global package consists of international companies except for firms from the U.S. and Canada.[32] Due to the limited number of observations before 1990, the sample period starts in 1990 and ends in 2018.

I used several other sources to collect data on other variables. Country-level trust variable as collected from the WVS.[33] I measured trust as the proportion of respondents who responded positively to the following question: *Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?* Following Alesina and La Ferrara (2000), I linearly interpolated to get interim values of social trust from one survey to the next. If the social trust values of any country were missing in the beginning or ending surveys, then I considered the social trust to remain the same for the previous and later periods from the available data point. The country-level governance data is from the World Governance Indicators (WGI).[34]

[31] For robustness test, I use a U.S. sample collected from the COMPUSTAT NA database.
[32] I drop the U.S. and Canadian firms from the study in case these firms report in COMPUSTAT global.
[33] WVS is a global network where researchers study changing values and their impacts on social and political life.
[34] WGI project reports aggregate and individual governance indicators data for 200 countries. The variables collected from the database are Voice and Accountability, Political Stability, Governance Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

Country-level factors such as GDP, stock and bond market development, inflation, and time required for enforceability are from the World Development Indicator (WDI).[35] Finally, creditors' rights data and shareholder protection rights index data were collected from La Porta et al. (1998) and Djankov et al. (2007). According to La Porta et al. (1998), a creditors' right score of one is assigned for each of the following four components: (1) are there restrictions such as creditor consent or minimum dividends for a debtor to file for reorganization? (2) can secured creditors seize their collateral after the reorganization petition is approved, i.e., is there an "automatic stay" or "asset freeze?" (3) are secured creditors paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers? (4) does management retain administration of its property pending the resolution of the reorganization. An affirmative (negative) condition for the first three conditions (last condition) imply stronger creditor rights. Thus, creditors' rights index ranges from 0 (weak creditors' rights) to 4 (strong creditors' rights).

The preliminary data sample includes 662,933 firm-year observations collected from COMPUSTAT Global. I removed all the regulated (SIC 4900-4999) and financial firms (SIC 6000-6999). If cash (che), tangibility (ppent), total asset (AT), cash-flow, total book leverage, and total debt were missing, I dropped these firm-years from the study. Moreover, I excluded observations if the value of cash (che), total assets (AT), and sales were negative. To make this study free from small firm bias, I excluded firms that had total assets of less than $1 million U.S. The values are inflation adjusted in terms of 2004 dollar value. To eliminate potential reporting bias in the sample, I excluded firm-years if one of the following ratios was greater than 1: LTD to total assets, short-term debt ratio, total debt ratio. I also excluded countries with very few observations. Countries having less than 50 firm-year observations and less than 15 unique trading firms were eliminated from the final sample. Observations were also dropped if I did not find the legal origin or creditors' rights data in the sample. Outliers may make the results biased; hence, I winsorized all continuous

[35] WDI covers time-series data for 217 countries.

variables at 1% and 99% to eliminate outliers. Finally, I dropped the firm-year observations if any of the control variables were missing. The final sample size stands at 238,933 firm-year observations from 32 countries.

2.4.2. Sample Descriptive Statistics

Table 2.1 reports the descriptive statistics for the key variables. The mean and median long-term debt (LTD) ratios are 0.111 and 0.068, respectively. The market leverage (MktLev), which is the total leverage divided by the market value of the firm, averages 0.299, while the median value is 0.236. The sample firms' average tangible assets ratio is 0.309 and the median value is 0.279. On average, firms in my sample are growth firms with a mean market-to-book ratio of 1.476 and a median of 1.095. The average profitability (net income divided by total assets) of sample firms is 0.038, while the median value is 0.049. The sample firms' median R&D expenditure scaled by sales is zero and the average value is 0.013. The average Altman Z-score measure of financial distress is 1.451 and the median value is 1.559. Lastly, the mean (median) total industry leverage of sample firms is 0.223 (0.213).

Table 2.2 reports mean values for selected variables categorized by country. Firms from Japan, India, and the UK dominate my sample. Almost 25.6% (61,220 firm-year observations) of observations are from Japan, making it the most participated country. Noticeably, the long-term debt ratio of Japanese firms is lower, 10.50%, than that of many other countries. The aggregate governance of Japan is in the 85th percentile.[36] Average social trust for Japan is 0.375, meaning that 37.5% of the respondents answered affirmatively that they trust most of the people in the society, while the mean trust value of the sample countries is 27.9%. The second dominating country is India. Almost 9.23% of observations came from 2,900 unique Indian firms. On average, Indian

[36] Aggregate governance is the percentile average of the six governance indicators: Voice and Accountability, Political Stability, Governance Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

firms use 14.7% long-term debt ratio in their capital structures. Approximately 19.5% of survey respondents from India answered that they trust most of the people in the society, while the aggregate governance index of India is in the 44th percentile. The third dominating country with respect to firm-year observations is the UK. These firms account for 19,954 firm-year observations, approximately 8.35% of sample observations, with an average 10.7% long-term debt ratio in their capital structures. The average social trust measure of the UK is 0.296, which is slightly above the sample mean.

Zimbabwe is the least participating country in the sample. Only 60 firm-year observations from 18 different firms belong to Zimbabwe. Colombian and Argentinian firms are second and third least participating firms with 308 and 798 firm-year observations, respectively. Relating to the social trust measure, Scandinavian countries are the most trustworthy countries. On average, 71.5% of respondents from Norway trust most of the people in the society, and 62.5% of Swedish respondents say that the people are trustworthy. On the other hand, Latin American countries display the least percentage of trust in society. On average, social trust measures for Brazil, Colombia, and Peru are 6.9%, 7.8%, and 8.0% respectively. Figure 1 displays time series graphs of social trust and leverage ratio.

2.4.3. Aggregate Level Flow of Financing for Countries Categorized by Social Trust

As a prelude to the main results, I provide a macro-level view of the relationship between social trust and sources of external financing. Specifically, using country-level flow-of-funds data, I see whether aggregate corporate capital sources are associated systematically with country-level differences in social trust.

In Table 2.3, I find some interesting results. In the first column, I report the net external financing scaled by total financing sorted by social trust tercile. Following the methodology of Rajan and Zingales (1995), I calculate net external financing as the sum of net total debt issued and

net total equity issued. Total financing is the sum of cash flows from operations and external financing. After sorting by trust tercile, I find that external financing scaled by total financing increases when trust in a country increases from the lowest tercile to the highest tercile, though the association is not monotonic. The results reveal that firms use more external financing when country-level trust is higher. In the next columns, I segregate external financing into equity and debt sources to see whether there are systematic differences across the country trust terciles.[37] I present aggregate dollar amounts as well as proportions relative to total assets. Firms in low-trust countries issue more equity financing both in dollars and percentage terms. The association of equity issuance and trust is negative, meaning that equity issuance decreases with an increase in social trust on average. In the next columns, I analyze aggregate debt issue categorized by social trust tercile. Long-term debt appears to be the primary source of external financing on average in a trust intensive society. The association is monotonically positive across the country trust terciles. The mean ratios of long-term debt ratio scaled by total assets also increase with the trust tercile. However, the association of short-term debt with social trust is not clear. Though the dollar values of short-term debt ratio exhibit positive association with social trust, the mean ratios of short-term debt scaled by total assets have no pattern, remaining the same for both low-and high-trust terciles. This is not surprising as agency issues may be less severe in the case of short-term debt. These results motivate us to study further the association of social trust and leverage ratio, especially long-term debt.

[37] Following Hovakimian, Opler, and Titman (2001, p. 4, footnote 4), I calculate that equity issue is the sale of common stock (sstk) minus purchase of common stock (prstkc) scaled by total asset exceeding 5%. To calculate the long-term and short-term debt issue, I track long-term (ltdch) and short-term debt change (dlcch) from the COMPUSTAT Global database.

2.5. Empirical Results

2.5.1. Trust and Capital Structure

I test the hypotheses using a panel regression framework. For the primary hypothesis (*H1*), I regress the long-term debt ratio on social trust along with other firm, industry, and country-level attributes. Specifically, I estimate the following regression model:

$$LTD_{i,t+1} = \alpha + \beta_1 * Trust_{i,t} + \gamma * Controls_{i,t} + d_j + d_c + d_t + \epsilon_{i,t} \quad (1)$$

where $LTD_{i,t+1}$ is firm *i*'s long-term debt scaled by total asset at time *t + 1*.[38] $Trust$ represents the measure of social trust as described previously. γ in the above equation represents the vector of coefficients of the control variables. Following existing literature, I identify 13 firm, industry, or country-level control variables that determine the capital structure of firms. The firm-level controls are Firm Size, Fixed Asset Ratio, Return on Asset, Growth Opportunity, Research and Development scaled by sales, and Altman Z-score. Industry Mean Leverage is the only industry-level control. Country-level factors included are as follows: GDP per capita, the Enforceability of Contracts, the Rule of Law, Government Effectiveness, Creditors' Rights, and Stock Market Development. The Appendix B.1. contains a detailed description of the variables. Finally, the model includes industry, country, and year fixed effects to capture the firm and year unobserved fixed effects. d_j denotes the industry-level fixed effects (to capture the industry unobserved variation), d_c is the country fixed effect, d_t represents year fixed effects (to capture the year

[38] Moreover, for a robustness check, I use market leverage and find the results robust.

specific unobserved variation), and $\epsilon_{i,t}$ is the white noise or cluster robust error at the firm-level with mean zero and standard deviation of 1.[39,40]

Estimates of Equation (1) are presented in Table 2.4. Columns 1 to 3 display the results with different fixed effect combinations in the model. In all the models, I find that social trust is positively and significantly associated with long-term debt ratio at the 1% level. The effect is also economically significant. In Column 3, the coefficient of 0.038 for social trust suggests that an increase in social trust from 25th percentile to 75th percentile (1-IQR change) is associated with a long-term debt ratio change of 0.63% (0.038 × 0.167), which is a 5.67% (0.63%/11.1%) increase relative to the sample mean leverage of 11.1%. The result supports the view that high trust reduces the friction (such as the need for monitoring of the debtors) in the market (Duarte et al., 2012; Meng & Yin, 2019), enabling firms to adopt a debt ratio in their capital structures.

Turning now to the control variables, I find that results are generally in line with prior studies. Findings are consistent with Öztekin (2015) that firm size, tangibility, and industry-leverage are positively associated with the long-term debt ratio. The empirical findings of size on leverage are mixed. For example, Rajan and Zingales (1995) and Booth et al. (2001) find conflicting results due to different sample selections. The finding of a positive association between size and leverage is consistent with the notion that bigger firms are more transparent and therefore may have a relatively lower cost (Byoun, 2008). They may also be more diversified or subject to lower bankruptcy risk (Timan & Wessels, 1988). Tangibility shows a positive association (consistent with Rajan & Zingales (1995) that is consistent with the fact that tangible assets are used as collateral, making them a relatively cheaper source of capital. The two-digit SIC industry mean leverage ratio is also

[39] I did not consider firm fixed effect in the models as there is not too much variation of social trust over the sample period. For robustness, I tested the model with firm fixed effect along with year fixed effect in a separate model and end up with consistent results.

[40] The errors in the model are primarily robust standard errors (Huber-White estimators that adjusted heteroscedasticity). For the sake of robustness, I consider firm-level clustering in at least one of the models in each test.

positively associated with leverage in all the models, meaning that firms in the same industry use a similar proportion of debt ratio on average. The Altman Z-score is negatively associated with leverage, meaning that lower financial distress firms are associated with lower long-term debt in capital structures. Lastly, other firm-level controls such as R&D to sales and growth opportunities are insignificant if I consider industry, country, and year fixed effects with clustered standard errors.

Along with the firm-specific factors, I also control for several country-specific factors defined in the Appendix B.1. Consistent with the findings of prior research (Öztekin, 2015), I find a positive association between leverage and the Rule of Law, Creditors' Rights, along with Stock Market Development. The results indicate that higher governance quality generally induces higher use of leverage in capital structures. However, some of the country-level factors, such as Enforceability of Contracts and Government Effectiveness display negative association with leverage, perhaps due to a higher correlation with other explanatory variables (e.g., Rule of Law). Overall, I find consistent coefficients with the previous literature.

2.5.2. Trust, Institutional Differences, and Leverage

In this section, I test interaction effects between trust and three measures of institutional differences across countries: Governance Quality, Creditors' Rights, and Financial Development (H2-H4). To test these interactions, I modify Equation (1) as follows.

$$LTD_{i,t+1} = \alpha + \beta_1 * Trust_{i,t} + \beta_2 * IE + \beta_3 * IE\ X\ Trust_{i,t} + \gamma * Controls_{i,t}$$

$$+ d_j + d_c + d_t + \epsilon_{i,t} \qquad (2)$$

Here, IE is a dummy variable if the particular institutional environment of interest is weak, i.e., Governance, Creditors' Rights, and Financial Development. I take the same controls used in Equation (1) along with industry, country, and year fixed effects.

Leverage, Trust, and Governance: Table 2.5 reports results of *H2* by including the interaction effect of trust with the country-level measure of Governance Quality.[41] To implement the test, I create a weak governance dummy ($WeakGovernance$) equal to 1 if the governance index is below the median value and 0 otherwise. I find that the interaction between trust and the weak governance dummy is positive. In each of the models in Columns 1 to 3, the interaction term between trust and weak governance is positive and significant at the 1% level, supporting hypothesis *H2*. More precisely, from Column 3, the coefficient of the interaction term is 0.082, meaning that if social trust increases from the 25th percentile to the 75th percentile (1-IQR change), the long-term debt ratio changes by 1.37% (0.082 × 0.167) for the firms in the weak governance countries. The results are significant both statistically and economically, supporting the hypothesis that the association of social trust with leverage is more pronounced for firms located in countries with weak governance.

Leverage, Trust, and Creditors' Rights: In Table 2.6, I regress the leverage ratio on social trust, interacting it with Creditors' Rights (*H3*). To test *H3*, I create a low Creditors' Rights dummy that is set equal to 1 if the Creditors' Rights score is ≤ 2 and 0 for Creditors' Rights scores of 3 or 4 (the maximum). In the supply-side view, strong Creditors' Rights encourage firms to take on more debt as the supply of debt is higher. I argue that trust in society increases confidence between creditors and issuers, which can serve to promote debt use even when Creditor's Rights at the institutional level are weak. Consistent with *H3*, I actually find that the positive impact of trust on the debt ratio is stronger when Creditor Rights are weaker. From Column 3, the coefficient of the interaction term is 0.138, meaning that if social trust increases from the 25th percentile to the 75th percentile (1-IQR change), the long-term debt ratio changes by 2.30% (0.138 × 0.167) for firms in low Creditors' Rights countries compared to high Creditors' Rights countries. The result is both statistically and

[41] I collect governance data from World Governance Indicators (WGI). WGI reports the percentile rank of each of the six indicators: Voice and Accountability, Political Stability, Governance Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. To calculate the governance index, I take the average of the percentile rank of all the governance indicators.

economically significant and supports the view that trust can ameliorate, to some extent, concerns over moral hazard between managers and creditors in economies with weak Creditors' Rights. Thus, markets appear to rely on intangible societal traits in place of formal institutional parameters (e.g., Governance and Creditors' Rights) in optimizing corporate financing policy.

Leverage, Trust, and Financial Development: The development of financial markets and institutions is a critical and inextricable part of economic growth (Levine, 1999). According to Liberti and Mian (2010) and Qian and Strahan (2007), financial development eases the lending and borrowing constraints with a concomitant decrease in the cost of debt. As with Country Governance and Creditors' Rights, I would like to see whether social trust plays a more substantial role in encouraging debt use when Financial Development is not as strong. To test the hypothesis, I create terciles based on FinMkt (a proxy of Financial Development as defined in the Appendix B.1) and create a dummy variable, $WeakFinDev$, assigning it a value of 1 for observations that fall into the bottom tercile of Financial Development and 0 otherwise.[42]

Table 2.7 reports the regression results of the long-term debt ratio on trust interacting with weak Financial Development. The significantly positive coefficient for the interaction between trust and weak Financial Development dummy supports the view that social trust as a determinant of debt policy is even stronger in weak Financial Development countries. The economic interpretation of Column 2 is that the long-term debt ratio increases by 0.23% (0.014 × 0.167) if social trust increases from the 25th percentile to the 75th percentile (1-IQR change) in the weak financially developed countries. Importantly, the association here is not as economically significant as for Governance and Creditors' Rights. It can be interpreted as trust acting as a mediating factor

[42] As explained in the Appendix B.1, FinMkt is computed by averaging standardized values of Stock Market and Bond Market Development. Stock market development is the standardized average value of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. Bond market development is the average of standardized values of liquid liabilities to GDP and domestic credit for private firms to GDP ratios. The results are robust if I take the median value to compute the WeakFin Dev instead of tercile.

that makes more sense for Governance and Creditors' Rights; conversely trust may be one of the many elements that determine Financial Development.

2.5.3. Leverage, Trust, and Firm-Specific Factors

In this section, I introduce firm-level variables and their interaction effect with social trust on the leverage ratio. The main hypothesis, which the results reliably support, argues that social trust is positively related to the use of debt. Secondarily, I also show that social trust can mitigate the negative effects of country-level governance and creditors' rights on the use of debt. A natural extension of the study is whether trust can moderate some of the firm-specific determinants of debt use. I argue that trust can mitigate some of the underlying risk factors for which fundamental variables proxy. I hypothesize that social trust can moderate the influence of firm proxies that imply higher costs of debt (e.g., due to agency or information asymmetry costs), and vice versa. This is because social trust acts as a mediator if there exists any firm-level friction, such as high distress risk.

I consider several important firm-level determinants of the capital structure such as Tangible Assets, Profitability, Size, Growth Opportunity, and Distress Risk following existing literature (Titman & Wessels, 1988; Guedes & Opler, 1996; Rajan & Zingales, 1995; Frank & Goyal, 2009, Öztekin, 2015). To test these predictions, I add an interaction between the high trust dummy variable and the selected firm-specific variables. The results are reported in Table 2.8. In Model 1, I test the interaction effect of trust with Asset Tangibility. From theory and prior evidence, I know that Tangible Assets are positively associated with firm leverage because they provide a degree of assurance of how funds are being invested and potential for recovery in the event of failure. In Hypothesis *H5*, I hypothesize that in a high trust environment, creditors may not rely as much on Tangible Assets to ensure their interests; therefore, I expect Tangible Assets to be less sensitive to debt financing in high-trust economies compared to low-trust economies. I find that the interaction

between social trust and Tangible Assets is negative, meaning that the association between leverage and tangible is less positive in countries with higher social trust.

Model 2 reports a positive interaction effect between social trust and Profitability. Existing literature shows a negative association between Profitability and leverage, consistent with the Pecking Order Model that due to information asymmetry, firms prefer to use internal financing before accessing debt and other external sources of capital. In Model 2, I find that the association of leverage and Profitability is less negative as the interaction term is positive; this offers support of Hypothesis *H6*. Thus, it appears that trust can moderate concerns over agency issues related to information asymmetry that restrain use of external debt capital. Next, I test Hypothesis *H7* by interacting Growth Opportunity with social trust. In Model 3, the interaction between social trust and Growth Opportunity is positive, which supports the hypothesis of a less negative association between leverage and Growth Opportunity in high social trust countries. The result supports the view that despite firm-level opaqueness associated with high-growth firms, creditors are willing to supply debt that they otherwise would not because of greater trust between people that translates to trust between financial parties. In Model 4, I interact social trust with firm Distress proxies, Altman Z-score. Extant evidence shows that Altman's Z-score is associated with a lower debt ratio. I find that the interaction terms for Model 4 are positive and significant at least the 1% level. This means that the association of leverage and financial distress is less negative in countries with higher social trust, consistent with the hypothesis *H8*. Overall, these results imply that the association of social trust and leverage is stronger (weaker) if firms' financial proxies indicate higher costs of debt financing due to agency and/or information asymmetry considerations.

2.6. Robustness and Endogeneity Tests

2.6.1. Additional Tests

In Table 2.9, I run several robustness tests to see whether the results are sensitive to (1) alternate measures of the leverage ratio, (2) dropping countries with disproportionately large sample size (the UK and Japan), and (3) additional firm, industry, and country-level control variables. In Column 1, I substitute market leverage for long-term debt ratio in the base model. Market leverage is defined as the ratio of total leverage over the market value of the firm (following Chen, Harford, & Kamara, 2019). The coefficient is positive (0.018) and statistically significant. Columns 2 and 3 report the regression results except for the firms from Japan and the UK, the two countries contributing the most to the sample. I find that the coefficient of social trust is 0.058 (0.024) for long-term debt (market leverage) ratio. Columns 4, 5, 6, and 7 report the regression adding some firm, industry, and country-level control variables. In Column 4, I add individualism and uncertainty avoidance from Hofstede's cultural dimensions measure to test whether the trust variable is still robust. I include the cultural traits of individualism, uncertainty avoidance, masculinity, and long-term orientation and find that the trust variable is still significantly positively associated with long-term debt ratio.[43] In Column 5, I control for additional firm, industry, and country-level variables but without the Hofstede cultural variables. In Column 6, I augment the model in Column 5 with the Hofstede cultural variables. Both models reveal that trust continues to be positively associated with the long-term leverage ratio and market leverage ratio. In Columns 8 and 9, I take excess long-term debt and market leverage as dependent variables and find that the associations of social trust and leverage is positive in these two regressions.[44] This implies that

[43] Following Mogha and Williams (2020), I control f Hofstede culture variables: individualism, uncertainty avoidance, masculinity, and long-term orientation. The other two factors, power distance and indulgence, are not included because these two controls are multicollinear with the previous four factors.
[44] Following Chen et al. (2019), I calculate excess leverage as the error of the regressions using Equation (1).

firms' deviation from the optimal leverage ratio is also higher if firms are headquartered in high social trust countries.

2.6.2. Endogeneity Test

Endogeneity is a common concern in almost all corporate finance studies. The main reasons for endogeneity are missing variables, misspecification of critical variables, or reverse causality. One may argue that the first two points apply to this study. I acknowledge the possibility of endogeneity and consider three tests: the instrumental variable approach, propensity score matching, and analysis using large changes in trust.

2.6.2.1. Instrumental Variable Approach

This approach requires that I find instruments to predict social trust where the instrument is presumed to be uncorrelated with the dependent variable. Importantly, finding appropriate instruments is one of the pre-conditions to obtain unbiased estimators. Based on the work of Davis (2016) I use rainfall variation as an instrument of social trust.[45] The data of rainfall variation is collected from Davis (2016), where the author uses rainfall variation as an instrument of individualism versus collectivism. He finds that rainfall variation is positively associated with collectivist societies; people in higher rainfall variation countries help each other more than in less rainfall variation countries. Hence, I use the rainfall variation as an instrument of trust, expecting a positive association between trust and rainfall variation. To validate the instrument, I take two

[45] Cline and Williamson (2016) use three instruments: pronoun drop, rainfall variation, and genetic distance from the U.S. as instruments of social trust. I also test with the three instruments and find the result robust, but the instruments do not pass the endogeneity test. The possible reason might be the difference in datasets. Cline and Williamson (2016) use cross-sectional data while I use panel data. Using panel dataset increases of the number of observations (*N*). According to Davidson and MacKinnon (2004, p. 336), "… the overidenfication test statistics will lead us to reject the null hypothesis whenever the sample size is large enough." Thus, even though I use the same instruments from the same datasets (following Cline and Williamson, 2016), the null hypothesis of the Hansen J test might be rejected due to the increase in the sample size. Considering all this, I take one instrument (rainfall variation) with proper economic intuition to predict social trust in the first stage.

consideration: adjusted R^2 and F-statistics.[46] The adjusted R^2 is around 20% benchmark and F-statistics are above the critical 10.0 benchmark.[47]

Table 2.10 reports the base regression results using the instrumental variables method. In the first column, I report the test statistic that regresses social trust with rainfall variation. I find that the coefficient of rainfall variation is positive and statistically significant at the 1% level in the expected direction. In the second stage (Columns 2 and 3), I use the predicted values of trust to regress on the long-term debt ratio along with other control variables. The two columns differ in the use of fixed effects. I find that coefficients of trust in both the models associate positively with long-term debt ratio and the statistics are significant at the 1% level. Hence, the results confirm the previous findings that social trust increases the use of long-term debt in the capital structures of firms.

2.6.2.2. Propensity Score Matching (PSM)

The presumption is that firms do not choose their domicile based on social trust; consequently, my baseline model can be used to draw a causal inference from social trust to debt ratio preference. However, if firm domicile (social trust) is endogenous, then drawing a causal inference may be problematic. To mitigate this concern, I use PSM technique. According to Caliendo and Kopeinig (2008), PSM has become a popular approach to estimate causal inferences. Specifically, the outcome involves speculation about how an individual firm would have performed if the firm had not received the treatment. Here, I am concerned about how firms' leverage ratios vary if firms are located in high trust societies. Thus, I create a treatment group consisting of firms located in high social trust countries and a control group of firms located in low-trust countries that are otherwise equal. I do this by ranking all the countries annually based on their social trust index

[46] I take one instrument to predict social trust. Thus, the Hansen overidentification test is not appropriate for the just-identified model.
[47] The correlation between trust and predicted trust is 73.82%, which validates that the instruments are strong.

and then identifying countries in the lowest (highest) quartile as low (high) social trust countries. This procedure generates 71,151 firm-year observations in the treatment group and a similar number of firm-year observations in the control group. Using this sample, I generate the propensity score running a logistic regression with a high social trust dummy as a dependent variable (1 for high-quartile firms and 0 for low-quartile firms) and all the independent variables used in the baseline regression. I then match without replacement each treatment observation with a unique control observation using a caliper of 0.1% to find the closest match.[48] After matching, I get 17,639 firm-year pair observations as treatment and control groups. Using this PSM sample, I re-estimate the baseline regression, which is shown in Table 2.11. From Columns 1 and 2, I find that the association between trust and the debt ratio is positive and significant at the 1% level, consistent with previous results. Relative to their matched counterparts in low-trust countries, firms located in the high social trust countries use more long-term debt in their capital structures.

2.6.2.3. Large Change Effect

Third, I analyze the effect of a large change in social trust on a large change in the leverage ratio. The analysis in this section mitigates the lingering concern about whether other country-specific factors drive the observed association. Practically, the trust of a society tends to change very slowly; thus, one may argue that the association may be due to country-level factors other than social trust. To overcome this issue, I estimate the large change effect in countries' trust over a longer period of time on changes in the long-term debt ratio. Following Adhikari and Agarwal (2016), I employ the following regression in which a five-year change in trust explains the five-year change in the long-term debt ratio. I create a dummy variable of large and small social trust changes over five years based on the terciles. Changes that fall into the highest (lowest) tercile are classified as large (small) changes. This is repeated on a rolling five-year basis. The dependent

[48] Caliper refers to the difference in the predicted propensity scores between the treatment and the match.

variable is the change in the long-term debt ratio over the five years on a rolling basis. I then run the following model consistent with Adhikari and Agarwal (2016):

$$\Delta_5 LTD_{t+1} = \beta_1 + \beta_2 Large\Delta_5 Trust_{i,t} + \beta_3 Small\Delta_5 Trust_{i,t} + d_t + \epsilon_{i,t} \quad (3)$$

where $\Delta_5 LTD_{t+1} = LTD_{t+1} - LTD_{t-4}$ and $Large\Delta_5 Trust_{i,t}(Small\Delta_5 Trust_{i,t}) = 1$ if $Trust_t - Trust_{t-5}$ is in the top (bottom) tercile of the sample during year *t*.[49] In Table 2.12, I find that firms in countries that experience the largest change in social trust increase their long-term debt ratios. Conversely, I also find that the firms in countries that experience the smallest change in social trust have a negative association with long-term debt ratios. Both the findings are statistically significant at the 1% level. The testable hypothesis is $\beta_1 - \beta_2 > 0$, meaning that firms increase their long-term debt ratio if social trust increases significantly. The results offer robust evidence that countries with larger social trust changes over the last five years increase their long-term debt ratios. Both Columns 1 and 2 show that the difference of statistic tests are positive and significant at the 1% level.

2.6.3. Robustness: Using the U.S. Sample

The main sample excludes U.S. firms because they would make up an overwhelming proportion of the total sample.[50] Given the international scope of the study, however, it would be considered incomplete if I ignored U.S. firms. Moreover, the empirical results based on global data contradict the results of the study of Huang and Shang (2019) for the U.S. Thus, further analysis of U.S. data would help provide additional robustness to the findings using a broader global dataset. I conduct two sets of tests in this section. In the first test, I simply augment the global dataset with U.S. data and re-run the baseline regression model. The second test estimates the relationship

[49] I calculate the change on a rolling basis so that the panel structure remains in the sample.
[50] In the preliminary study, I ignore the U.S. sample because it is almost 50% of the total sample. This may bias result. In this section, I include the U.S. sample with the global database and rerun Equation (1) for a robustness test.

between leverage and trust for U.S. firms but only using a state-level measure of trust and firms located in that state (headquarters). The intent here is twofold. First, despite controlling for a number of country-level variables and undertaking several robustness tests, it is still possible that the country-level measure of trust may be picking up some other trait or country characteristic. By focusing on a single country, I avoid such a criticism. Second, I would like to see whether the replication using U.S. data is consistent with the broader findings globally or whether they reconfirm the contradictory findings reported by Huang and Shang (2019).

Table 2.13, Panel A reports the regression results of social trust on the long-term leverage ratio, including the U.S. sample with the global sample database. Consistent with the baseline results in Table 2.4, I find that social trust associates positively with long-term debt ratio. Columns 1 and 2 report the alternative fixed effects model, and the coefficients of social trust in both the models are positive and statistically significant at the 1% level. Columns 3 and 4 report the instrumental variable (IV) regressions taking the same instrument (rainfall variation) used in Table 2.10. I find that the coefficients are positive and significant at the 1% level.

Panel B reports the regression results of state-level U.S. social trust on the leverage ratio. As a trust measure, I use Putnam's (1993) state-level trust measure, $Trust_{US}$, based on fraction of people in the state that believe most of the people in the society are trustworthy.[51] $Trust_{US}$ is a state-level static trust measure meaning that the Putnam measure does not change over time (it is a one-time measure). Consistent with the baseline regression, I control for the following variables: size, tangible assets scaled by total assets, ROA, market-to-book ratio, R&D to sales, Altman Z-score, and mean industry leverage. The variables are defined in the Appendix B.1. Firms' locations are identified by the headquarter locations provided by COMPUSTAT. I control for additional

[51] I collect the Putnam trust measure from Putnam's official website.

variables used in Huang and Shang (2019), such as size^2 (for capturing nonlinearity). I use U.S. data from 1990 to 2018.

From Panel B, I observe that social trust associates positively with the long-term debt ratio for U.S. firms using state-level trust data. In Column 1, I find that the coefficient of trust is 0.051 with a significance level at 1%. Column 2 reports the regression coefficients when I take size^2 as an additional control (as per Huang and Shang, 2016) in the model. The results are consistent. In Columns 3 and 4, I adopt an instrumental variable approach taking two instruments for social trust: number of times people volunteered per capita and a measure of "most people are honest in the society."[52] Both instruments indirectly affect state-level social trust but do not affect the dependent variable. First, the number of volunteer activities per year proxies social trust since a trust-intensive society constrains opportunistic behavior; thus, individuals voluntarily participate in community betterment projects. Moreover, Campbell (2000) states that participating in volunteer activities builds social capital. Second, I consider the honesty in the society as an instrument of social trust. The Hansen J score of overidentification test shows that the instruments are exogenous. After adopting the IV approach, I again confirm in Columns 3 and 4 that social trust and the long-term debt ratio are positively related. Overall, the results offer robust evidence that social trust is positively associated with the long-term leverage ratio in the U.S. and mirrors my broader findings using a global framework.

2.7. Conclusion

The role of social trust as a determinant of capital structure choice has received little attention to date. This study provides deeper insight into understanding the role of social trust in borrowing

[52] Participation in volunteer activities and people honesty data are collected from Putnam (1993). The volunteer data is scaled by the population of the state.

and its implication as a country-level factor. I argue that intangible assets such as social trust can also serve as important collateral to increase firms' debt capacity.

Overall, the results demonstrate that social trust is a critical country-level factor that determines the cost of debt and capital structure. Using a large sample of firm-year data from 32 countries, I report a significant positive association between social trust and long-term debt ratio. Furthermore, I find that social trust can mitigate the effects of critical institutional factors, including countries' governance quality, creditors' rights, and financial development. The results offer robust evidence of a stronger positive association between social trust and long-term debt when governance and creditors' rights are weak and financial development is low. Additionally, I find that social trust moderates the effects of certain firm-level factors that impact firm leverage, including profitability, growth opportunity, tangibility, and firms' distress measures.

I validate the results by adding additional firm, industry, and country-level factors. The association between trust and leverage holds even if when I add more control variables. I also take alternative measures of leverage, market leverage, and find that the association between social trust and leverage is positive. The tests of endogeneity reveal that the results are consistent with the hypotheses if I use instruments and match with similar peer firms. Lastly, the association remains robust when I add U.S. data with the global data. This study is perhaps the first study to reveal the importance of social trust in the capital structure decisions for global firms. Short-term and long-term performance for firms that use higher leverage in high social trust countries are subject to future research.

Figure 2.1. Trust and Leverage

This figure reports the time-series pattern of country trust, equity issue, debt issue, and deficit financing. Following Hovakimian et al. (2001), the net equity issue is the change of equity over total assets (sstk-prstkc/total assets) greater than 5%. Following Hovakimian et al. (2001), the net debt issue is tracked from the change of short-term debt or long-term debt reported in the COMPUSTAT Global. Deficit financing is calculated as $(Dividend + investment + \Delta WC - Internal\ CF)/AT$.

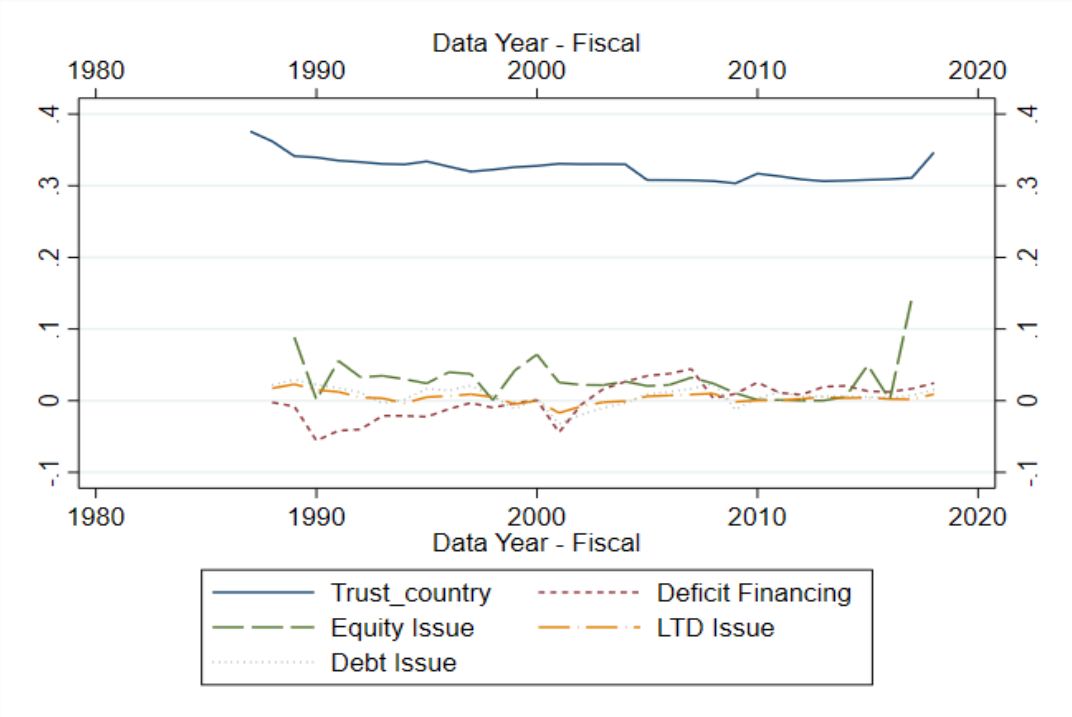


Table 2.1. Descriptive Statistics

This table presents the mean value of variables for each country. Market leverage is (long-term debt+ short-term debt)/market value of the assets. The long-term debt ratio (LTD) is (dltt/AT). Profitability (ROA) is EBIT/AT. Tangibility is Property, plant, and equipment(ppent)/Total Assets (AT). Growth Opportunity is the ratio of market value over book value. Altman Z-score is calculated as 3.3(EBIT/AT)+1.0(Sales/AT)+1.4(RE/AT)+1.2(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the SIC 2-digit industry mean leverage. *N* represents the total number of firm-year observations for this sample country.

Variable Name	Mean	Std. Dev	P10	P25	P50	P75	P90	Min	Max	*N*
LTD	0.111	0.126	0.000	0.003	0.068	0.178	0.297	0.000	0.497	238,933
Market Leverage (MktLev)	0.299	0.272	0.000	0.048	0.236	0.493	0.717	0.000	0.962	238,933
Asset (USD)/1000	1.566	8.113	0.017	0.051	0.175	0.638	2.401	0.003	26.921	238,933
Tangibility	0.309	0.219	0.039	0.132	0.279	0.447	0.621	0.002	0.888	238,933
ROA	0.038	0.117	-0.061	0.012	0.049	0.094	0.148	-0.493	0.253	238,933
Growth Opportunity	1.476	1.221	0.707	0.875	1.095	1.542	2.506	0.467	7.625	238,933
RnD	0.013	0.040	0.000	0.000	0.000	0.004	0.035	0.000	0.238	238,933
Altman Z-Score	1.451	3.286	0.019	0.881	1.559	2.215	2.918	-6.539	5.700	238,933
Mean Ind. Leverage	0.223	0.100	0.110	0.154	0.213	0.278	0.354	0.040	0.519	238,933

Table 2.2. Descriptive Statistics: Categorized by Country

This table presents the mean value of variables for each country. Market Leverage is (long-term debt+ short-term debt)/market value of the assets. The Long-Term Debt ratio is long-term debt (dltt)/total assets (AT). Profitability (ROA) is EBIT/AT. Tangibility is (property, plant, and equipment)/AT. Growth Opportunity is the ratio of market value over book value. Altman Z-Score is calculated as 3.3*(EBIT/AT)+1.0*(sales/AT)+1.4*(RE/AT)+1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the SIC 2-digit industry mean leverage. *N* represents the total number of firm-year observations for this sample country. # of Distinct Firms represents how many unique firms prevail in the sample country. Aggregate Governance is the average percentile rank of six governance indicators. Trust is the percentage of WVS respondents saying they trust people they meet for the first time.

	LTD	Mkt. Lev	Asset (bn$)	Tangiblit -y	ROA	Growth Oppor- tunity	RnD	Altman Z-Score	Mean Indus. Lev	*N*	# of Distinct Firms	Agg. Gover- nance	Trust
Argentina	0.107	0.274	1.224	0.385	0.083	1.725	0.000	1.589	0.215	798	65	0.445	0.190
Australia	0.083	0.142	0.562	0.341	-0.065	1.858	0.022	-0.984	0.131	17,024	2,145	0.926	0.498
Brazil	0.167	0.341	2.309	0.338	0.065	2.644	0.002	1.064	0.286	2,951	322	0.519	0.069
Chile	0.158	0.220	1.656	0.431	0.054	2.986	0.000	1.261	0.240	1,559	143	0.826	0.151
Colombia	0.100	0.252	3.309	0.448	0.055	1.140	0.000	4.621	0.152	308	35	0.418	0.078
Egypt	0.066	0.217	0.546	0.391	0.077	1.360	0.000	1.444	0.182	1,110	141	0.268	0.214
Finland	0.163	0.315	1.481	0.276	0.058	1.466	0.028	1.841	0.244	1,727	151	0.979	0.554
France	0.126	0.315	3.301	0.182	0.044	1.432	0.018	1.399	0.213	9,710	987	0.843	0.186
Germany	0.111	0.265	3.386	0.232	0.027	1.514	0.024	1.464	0.189	10,640	992	0.908	0.351
Hongkong	0.080	0.266	0.763	0.300	0.015	1.445	0.005	0.969	0.190	3,758	687	0.864	0.441
India	0.147	0.402	0.483	0.340	0.071	1.443	0.005	1.662	0.291	22,057	2,900	0.439	0.195
Indonesia	0.144	0.328	0.537	0.401	0.073	2.099	0.000	4.401	0.297	4,512	426	0.354	0.398
Israel	0.145	0.294	0.937	0.204	0.024	2.115	0.049	0.584	0.250	3,080	383	0.688	0.229
Italy	0.127	0.443	3.093	0.233	0.031	1.257	0.007	1.590	0.259	3,245	345	0.716	0.275
Japan	0.105	0.328	2.187	0.292	0.044	1.200	0.015	1.864	0.233	61,220	4,093	0.849	0.375
Jordan	0.057	0.214	0.114	0.408	0.034	1.298	0.001	1.076	0.173	1,034	118	0.500	0.202
Malaysia	0.082	0.285	0.339	0.349	0.042	1.260	0.004	1.226	0.211	14,300	1,095	0.614	0.087
Mexico	0.181	0.353	3.574	0.452	0.083	1.364	0.000	1.582	0.251	1,677	136	0.459	0.175
Netherlands	0.134	0.262	2.939	0.264	0.065	1.610	0.015	1.786	0.220	2,563	242	0.957	0.481
Nigeria	0.072	0.239	0.270	0.449	0.082	1.819	0.001	1.518	0.204	810	103	0.159	0.167
Norway	0.206	0.295	1.573	0.330	0.012	2.087	0.015	0.985	0.281	2,674	331	0.965	0.715
Pakistan	0.121	0.421	0.185	0.465	0.094	1.308	0.001	1.827	0.301	2,892	317	0.213	0.239
Peru	0.114	0.370	0.659	0.504	0.089	1.186	0.001	1.353	0.203	831	82	0.439	0.080
S Korea	0.093	0.412	1.612	0.336	0.037	1.179	0.014	2.094	0.273	13,752	1,743	0.728	0.293
Singapore	0.085	0.269	0.568	0.291	0.027	1.302	0.004	1.205	0.197	8,266	737	0.877	0.283
South Africa	0.088	0.205	1.004	0.315	0.095	1.538	0.002	2.108	0.159	3,999	381	0.616	0.148

Spain	0.160	0.366	4.394	0.324	0.053	1.482	0.006	1.142	0.266	2,201	205	0.788	0.244
Sweden	0.121	0.230	1.132	0.199	0.004	1.796	0.032	1.239	0.182	4,086	540	0.963	0.625
Switzerland	0.145	0.263	2.622	0.305	0.051	1.653	0.030	1.558	0.211	3,503	274	0.966	0.438
Thailand	0.102	0.295	0.453	0.390	0.058	1.446	0.000	1.519	0.258	7,491	621	0.479	0.367
Turkey	0.090	0.254	1.193	0.328	0.049	1.751	0.005	1.300	0.215	3,052	314	0.479	0.102
UK	0.107	0.198	1.489	0.285	0.033	1.787	0.022	1.273	0.171	19,954	2,512	0.893	0.296
Zimbabwe	0.051	0.225	0.233	0.425	0.105	1.496	0.002	2.884	0.127	60	18	0.090	0.084

Table 2.3. Sources of External Financing Categorized by Social Trust

This table presents the mean value of total external financing categorized by social trust. Following Rajan and Zingales (1995), external financing is a fraction of net external funding over total financing (sum of cash flows from operations and net external financing). Net external financing is the sum of net total debt issues and net equity issues. External financing is calculated from the aggregate sample of nonfinancial firms reported in the COMPUSTAT Global. Net debt issues, and equity issues are calculated following Hovakimian et al. (2001). While net total debt financing is the sum of net short-term debt issuance and long-term debt issuance adjusted with the debt reductions, Equity issuance is the change of equity (CEQ) greater than 5% in a given year. The mean values are categorized by the trust tercile of low trust, medium trust, and high trust. The mean issue scaled by mean total asset for each tercile is reported in the bracket.

			Debt Issue		
	External Financing as a Fraction of Total Financing	**Equity Issue $ Billion (Mean Issue Scaled by Asset)**	**Long-Term Debt Issue $ Billion (Mean Issue Scaled by Asset)**	**Short-Term Debt Issue $ Billion (Mean Issue Scaled by Asset)**	**Total Debt Issue $ Billion (Mean Issue Scaled by Asset)**
Low Trust	0.074	122.28 (0.37)	-7.09 (0.09)	-64.68 (0.02)	-71.77 (0.11)
Medium Trust	0.051	1.89 (0.04)	3.00 (0.01)	-1.13 (0.001)	1.87 (0.01)
High Trust	0.087	45.20 (0.14)	25.73 (0.56)	13.29 (0.02)	39.03 (0.59)

Table 2.4. Base Regression

This table presents the regression results of firm-leverage and social trust with other control variables. Trust is the percentage of WVS respondents saying they trust people when they meet for the first time. Size is the natural log of the total assets (AT) in USD. Tangibility is the Property, Plant, and Equip./AT. ROA is EBIT/AT. Growth Opportunity is the market to book value of the asset. Altman Z-score is calculated as 3.3*(EBIT/AT)+1.0*(Sales/AT)+1.4*(RE/AT)+1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the average total leverage of 2-digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent to which agents abide by the rules of society. Governance Effectiveness captures the perceptions of the quality of public services. Creditors' Rights are derived from Djankov et al. (2007). Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

Dependent Variable: LTD/AT_{t+1}	**(1)**	**(2)**	**(3)**	**(4)**
Trust	**0.023*****	**0.031*****	**0.038*****	**0.035*****
	(3.805)	**(5.684)**	**(3.580)**	**(5.746)**
Size	0.017***	0.027***	0.017***	0.016***
	(114.941)	(56.325)	(42.460)	(40.073)
Tangibility	0.129***	0.081***	0.130***	0.129***
	(90.714)	(35.802)	(39.414)	(38.532)
ROA	0.011***	-0.005**	0.011***	0.016***
	(5.102)	(-2.398)	(2.805)	(4.009)
Growth Opportunity	-0.001***	0.001**	-0.001***	0.000
	(-7.068)	(2.265)	(-3.608)	(0.569)
RnD	-0.085***	0.001	-0.090***	-0.073***
	(-13.334)	(0.059)	(-6.820)	(-5.376)
Altman Z-Score	-0.004***	-0.002***	-0.004***	-0.004***
	(-13.670)	(-10.202)	(-5.631)	(-5.822)
Mean Ind. Leverage	0.422***	0.284***	0.434***	0.414***
	(127.892)	(62.994)	(59.441)	(58.234)
GDP per Capita/ 100,000	-0.007	-0.054***	-0.071***	-0.074***
	(-1.561)	(-10.137)	(-7.730)	(-9.008)
Enforceability of Contracts	-0.000	-0.000***	-0.000***	0.000***
	(-0.432)	(-12.358)	(-8.615)	(20.670)
Rule of Law	0.027***	0.021***	0.027***	0.031***
	(15.209)	(12.012)	(8.968)	(12.801)
Government Effectiveness	-0.006***	-0.020***	-0.013***	-0.005**
	(-5.831)	(-17.400)	(-6.217)	(-2.426)
Creditors' Right	0.004***	0.004***	0.004*	-0.005***
	(3.071)	(3.198)	(1.872)	(-7.279)
Stock Market Development	0.008***	0.003***	0.004***	0.008***
	(23.630)	(7.631)	(6.016)	(11.172)
Constant	-0.100***	-0.112***	-0.108***	-0.147***
	(-21.160)	(-22.532)	(-9.459)	(-5.338)
Observations	238,653	238,933	238,653	238,653
Adjusted R^2	0.310	0.661	0.313	0.287
Ind FE	YES	YES	YES	NO
Country FE	NO	NO	YES	NO
Ind X Country FE	NO	NO	NO	YES
Year FE	NO	YES	YES	NO
Clustering	NO	NO	Firm-Level	Firm-Level

Table 2.5. Leverage, Trust, and Governance

This table presents the regression results of firm-leverage and country trust when the country's governance is weak. The dependent variable is the long-term debt ratio. Trust is the percentage of WVS respondents saying that they trust people they meet for the first time. Weak Governance is a dummy variable 1 if the aggregate governance is below the median value, 0 otherwise. Aggregate Governance is an index of average percentile rank of voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law, and control of corruption for each country. Size is a natural log of total assets (AT). Tangibility is the Property, Plant, and Equip/AT. ROA is EBIT/AT. Growth Opportunity is the market-to-book ratio of the asset. Altman Z-score is calculated as 3.3*(EBIT/AT)+1.0*(Sales/AT)+1.4*(RE/AT)+1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the average total leverage of 2-digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception to the extent to which agents abide by the rules of society. Governance Effectiveness captures the perceptions of the quality of public services. Creditors' Rights are derived from Djankov et al. (2007). Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

Dependent VARIABLE: LTD/AT_{t+1}	**(1)**	**(2)**	**(3)**
Trust	0.014*	-0.004	-0.004
	(1.744)	(-0.523)	(-0.329)
WeakGovernance (1 if above median, 0 otherwise)	-0.017***	-0.034***	-0.034***
	(-4.867)	(-9.564)	(-6.703)
Trust* WeakGovernance	**0.027*** **	**0.082*** **	**0.082*** **
	(2.725)	**(7.860)**	**(5.394)**
Size	0.019***	0.019***	0.019***
	(120.646)	(121.228)	(44.107)
Tangibility/AT	0.052***	0.055***	0.055***
	(24.405)	(25.820)	(11.244)
ROA	0.022***	0.022***	0.022***
	(8.048)	(8.037)	(4.480)
Growth Opportunity	-0.002***	-0.002***	-0.002***
	(-11.916)	(-11.821)	(-5.954)
RnD	-0.105***	-0.109***	-0.109***
	(-15.793)	(-16.391)	(-7.793)
Altman Z-Score	-0.005***	-0.005***	-0.005***
	(-14.541)	(-14.660)	(-6.126)
Mean Ind. Leverage	0.449***	0.460***	0.460***
	(133.120)	(135.334)	(60.534)
GDP per Capita/ 100,000	-0.017***	-0.069***	-0.069***
	(-3.524)	(-10.563)	(-7.086)
Enforceability of Contracts	-0.000***	-0.000***	-0.000***
	(-2.692)	(-12.336)	(-9.404)
Rule of Law	0.021***	0.021***	0.021***
	(11.602)	(11.182)	(6.971)
Government Effectiveness	-0.003***	-0.009***	-0.009***
	(-2.794)	(-6.767)	(-3.976)
Creditors' Rights	0.002	0.002	0.002
	(1.211)	(1.250)	(0.917)
Stock Market Development	0.007***	0.003***	0.003***
	(19.188)	(5.536)	(4.128)
Constant	-0.070***	-0.067***	-0.067***
	(-13.334)	(-11.217)	(-5.888)
Observations	238,653	238,653	238,653
Adjusted R^2	0.279	0.282	0.282
Ind FE	YES	YES	YES
Country FE	YES	YES	YES
Year FE	NO	YES	YES
Clustering	NO	NO	Firm-Level

Table 2.6. Leverage, Trust, and Creditors' Rights

This table presents the regression results of firm-leverage and country trust when the firms located in weak creditors' rights countries. The dependent variable is the long-term debt ratio. Trust is the percentage of WVS respondents saying they trust people they meet for the first time. Low Creditors' Rights is a dummy variable if creditors' rights are ≤2, 0 otherwise. $Ln(AT)$ is the natural log of the total assets (AT). Tangibility is the Property, Plant, and Equip/AT. ROA is EBIT/AT. Growth Opportunity is the market-to-book ratio of the asset. Altman Z-score is calculated as 3.3*(EBIT/AT)+1.0*(Sales/AT)+1.4*(RE/AT)+1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the average total leverage of 2-digit SIC industry. The Enforceability of Contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception to the extent that agents abide by the rules of society. Governance Effectiveness captures the perceptions of the quality of public services. Creditors' Rights are derived from Djankov et al. (2007). Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	**(1)**	**(2)**	**(3)**
Trust	-0.033***	-0.018***	-0.018
	(-4.761)	(-2.622)	(-1.616)
Creditors' Right	0.015***	0.018***	0.018***
	(11.070)	(10.710)	(8.145)
Trust * Low Creditors' Right	**0.130*** **	**0.138*** **	**0.138*** **
	(15.803)	**(15.986)**	**(10.580)**
Size	0.019***	0.019***	0.019***
	(120.776)	(121.273)	(44.206)
Tangibility	0.052***	0.055***	0.055***
	(24.372)	(25.754)	(11.220)
ROA	0.022***	0.022***	0.022***
	(8.019)	(8.053)	(4.501)
Growth Opportunity	-0.003***	-0.003***	-0.003***
	(-12.468)	(-12.405)	(-6.253)
RnD	-0.104***	-0.108***	-0.108***
	(-15.628)	(-16.173)	(-7.687)
Altman Z-Score	-0.005***	-0.005***	-0.005***
	(-14.575)	(-14.696)	(-6.146)
Mean Ind. Leverage	0.451***	0.462***	0.462***
	(134.254)	(136.123)	(60.848)
GDP per Capita/ 100,000	-0.009**	-0.072***	-0.072***
	(-2.072)	(-11.263)	(-7.493)
Enforceability of Contracts	-0.000*	-0.000***	-0.000***
	(-1.752)	(-11.783)	(-8.946)
Rule of Law	0.029***	0.028***	0.028***
	(15.825)	(14.865)	(9.279)
Government Effectiveness	-0.001	-0.007***	-0.007***
	(-0.671)	(-5.935)	(-3.286)
Stock Market Development	0.006***	0.003***	0.003***
	(18.058)	(5.761)	(4.283)
Constant	-0.108***	-0.120***	-0.120***
	(-21.840)	(-21.029)	(-10.809)
Observations	238,653	238,653	238,653
Adjusted R^2	0.280	0.282	0.282
Ind FE	YES	YES	YES
Country FE	YES	YES	YES
Year FE	NO	YES	YES
Clustering	NO	NO	Firm-Level

Table 2.7. Leverage, Trust, and Financial Development

This table presents the regression results of firm-leverage and country trust when firms are headquartered in weak financial developed countries. The dependent variable is the long-term debt ratio. Trust is the percentage of WVS respondents saying they trust people they meet for the first time. WeakFinDev is a dummy variable if the country's FinMkt, financial development index, is below (above) the median. Size is the natural log of the total assets (AT). Tangibility is the Property, Plant, and Equip./AT. ROA is EBIT/AT. Growth Opportunity is the market-to-book ratio of the asset. Altman Z-score is calculated as 3.3*(EBIT/AT)+1.0*(Sales/AT) +1.4* (RE/AT)+1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the average total leverage of 2-digit SIC industry. The Enforceability of Contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception to the extent that agents abide by the rules of society. Governance Effectiveness captures the perceptions of the quality of public services. Creditors' Rights are derived from Djankov et al. (2007). Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	**(1)**	**(2)**	**(3)**
Trust	0.008	0.036***	0.036***
	(1.253)	(5.474)	(3.238)
$WeakFinDev$ (1 if Fin Mkt is in bottom Tercile, 0 Otherwise)	-0.005***	-0.003*	-0.003
	(-3.169)	(-1.797)	(-1.321)
Trust* $WeakFinDev$	**0.023*** **	**0.014*** **	**0.014** **
	(5.211)	**(3.189)**	**(2.332)**
Size	0.019***	0.019***	0.019***
	(117.804)	(118.905)	(43.785)
Tangibility	0.048***	0.054***	0.054***
	(21.910)	(24.642)	(10.830)
ROA	0.002	0.003	0.003
	(1.326)	(1.631)	(1.200)
Growth Opportunity	0.025***	0.025***	0.025***
	(7.927)	(7.926)	(4.576)
RnD	-0.003***	-0.003***	-0.003***
	(-12.874)	(-12.362)	(-6.263)
Altman Z-Score	-0.117***	-0.121***	-0.121***
	(-16.763)	(-17.287)	(-8.263)
Mean Ind. Leverage	-0.005***	-0.005***	-0.005***
	(-14.239)	(-14.302)	(-6.469)
GDP per Capita/ 100,000	0.448***	0.459***	0.459***
	(129.026)	(131.392)	(59.168)
Enforceability of Contracts	-0.006	-0.081***	-0.081***
	(-1.270)	(-12.907)	(-8.885)
Rule of Law	-0.000***	-0.000***	-0.000***
	(-3.504)	(-13.028)	(-9.853)
Government Effectiveness	0.024***	0.024***	0.024***
	(12.734)	(12.187)	(7.529)
Stock Market Development	0.007***	-0.006***	-0.006***
	(6.415)	(-4.938)	(-2.941)
Constant	-0.076***	-0.091***	-0.091***
	(-15.557)	(-16.172)	(-8.264)
Observations	228,719	228,719	228,719
Adjusted R^2	0.278	0.281	0.281
Ind FE	YES	YES	YES
Country FE	YES	YES	YES
Year FE	NO	YES	YES
Clustering	NO	NO	Firm-Level

Table 2.8. Leverage, Trust, and Firm-Specific Factors

This table presents the regression results of firm-leverage and country trust. The dependent variable is the long-term debt ratio. Trust is the percentage of WVS respondents saying they trust people they meet for the first time. $High_{Trust}$ is a dummy variable 1 if country trust lies above the median value, 0 otherwise. Size is the natural log of the total assets (AT). Tangibility is the (Property, Plant, and Equip)/AT. ROA is EBIT/AT. Growth Opportunity is the market to book ratio. Altman Z-score is calculated as 3.3*(EBIT/AT)+1.0*(Sales/AT)+ 1.4*(RE/AT)+1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the average total leverage of 2-digit SIC industry. The Enforceability of Contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception to the extent that agents abide by the rules of society. Governance Effectiveness captures the perceptions of the quality of public services. Creditors' Rights are derived from Djankov et al. (2007). Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	**(1) Tangibility**	**(2) ROA**	**(3) MkttoBook**	**(4) Altman_Z**
$High_{Trust}$	0.150***	0.002	0.000	-0.002
	(5.770)	(0.870)	(0.111)	(0.891)
Tangibility	0.141***	0.130***	0.130***	0.128***
	(36.900)	(39.602)	(39.410)	(39.049)
Size	0.017***	0.017***	0.017***	0.017***
	(42.489)	(43.671)	(42.607)	(44.566)
ROA	0.011***	-0.011	0.011***	0.008*
	(2.696)	(-1.279)	(2.870)	(1.852)
Growth Opportunity	-0.002***	-0.001***	-0.002***	-0.001***
	(-3.751)	(-3.011)	(-4.424)	(-3.294)
RnD	-0.094***	-0.097***	-0.091***	-0.098***
	(-7.133)	(-7.401)	(-6.907)	(-7.603)
Altman Z-Score	-0.004***	-0.004***	-0.004***	-0.006***
	(-5.657)	(-6.748)	(-5.650)	(-8.055)
Mean Ind. Leverage	0.434***	0.433***	0.435***	0.432***
	(59.406)	(59.277)	(59.509)	(59.263)
Tangibility/AT* $High_{Trust}$	**-0.039*** **			
	(-6.860)			
ROA* $High_{Trust}$		**0.036*** **		
		(4.158)		
MkttoBook* $High_{Trust}$			**0.002** **	
			(2.426)	
Altman_Z* $High_{Trust}$				**0.004*** **
				(5.226)
Constant	-0.137***	-0.133***	-0.132***	-0.130***
	(-16.322)	(-15.938)	(-15.788)	(-15.633)
Country-Level Control	YES	YES	YES	YES
Observations	238,653	238,653	238,653	238,653
Adjusted R^2	0.314	0.314	0.313	0.315
Ind FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Clustering	Firm-Level	Firm-Level	Firm-Level	Firm-Level

Table 2.9. Robustness Test: Market Leverage and Adding Other Control Variables

This table presents the regression results of firm-leverage and country trust taking additional firm and country-level controls. The dependent variable is the long-term debt ratio and market leverage (MktLev). Trust is the percentage of WVS respondents saying they trust people they meet for the first time. Market leverage (MktLev) is calculated as Total Leverage/Market value. The Appendix B.1. contains the variable descriptions. Standard errors are adjusted for heteroscedasticity (Huber-White estimators). ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Except for Japan and the UK (Cols. 2-3)			Additional Firm and Country-Level Variables (Cols 4-7)			Excess Leverage (Cols. 8-9)	
VARIABLES	**MktLev**	**LTD**	**MktLev**	**LTD**	**LTD**	**LTD**	**MktLev**	**ExcessLTD**	**ExcessMkt**
Trust	**0.018***	**0.058*****	**0.024***	**0.038*****	**0.039*****	**0.039*****	**0.055*****	**0.066*****	**0.024*****
	(1.721)	**(8.427)**	**(1.791)**	**(6.093)**	**(5.168)**	**(5.168)**	**(3.774)**	**(5.336)**	**(3.752)**
Size	0.063***	0.018***	0.023***	**0.017*****	**0.015*****	**0.015*****	**0.015*****	**0.000**	**0.001*****
	(64.675)	(99.019)	(60.587)	(115.713)	(79.127)	(79.566)	(35.626)	(0.011)	(9.391)
Tangibility	0.137***	0.124***	0.127***	0.130***	0.138***	0.138***	0.127***	0.006**	0.003*
	(34.637)	(74.277)	(40.964)	(91.722)	(58.457)	(58.452)	(29.978)	(2.152)	(1.807)
ROA	-0.031***	0.006***	-0.033***	0.011***	0.032***	0.031***	0.011	0.000	-0.004*
	(-5.438)	(2.928)	(-4.870)	(5.022)	(5.096)	(5.032)	(0.843)	(0.007)	(-1.647)
Growth Opportunity	-0.031***	-0.002***	-0.059***	-0.001***	0.001**	0.001**	-0.046***	0.000	-0.002***
	(-65.632)	(-10.575)	(-137.175)	(-7.167)	(2.340)	(2.217)	(-68.293)	(0.911)	(-8.717)
RnD	-0.056***	-0.045***	-0.226***	-0.090***	-0.066***	-0.067***	-0.170***	0.007	-0.017***
	(-3.585)	(-5.889)	(-15.835)	(-14.167)	(-8.522)	(-8.556)	(-10.056)	(0.587)	(-2.741)
Altman Z-Score	-0.005***	-0.003***	-0.004***	-0.004***	-0.005***	-0.005***	-0.012***	-0.000	0.000
	(-9.539)	(-12.078)	(-7.564)	(-13.781)	(-12.074)	(-12.061)	(-10.285)	(-0.476)	(1.143)
Intangible to Asset					0.075***	0.075***	0.058***		
					(11.941)	(11.942)	(8.803)		
Financial Slack					0.049***	0.049***	0.083***		
					(12.986)	(12.990)	(11.970)		
Inventory to Asset					0.019***	0.019***	0.167***		
					(6.103)	(6.133)	(10.613)		
Dividend to Asset					-0.007	-0.007	0.008		
					(-0.639)	(-0.646)	(0.267)		
Tax to Asset					-0.151***	-0.151***	-0.399***		
					(-7.730)	(-7.688)	(-6.556)		
Cash to Asset					-0.125***	-0.126***	-0.446***		
					(-24.997)	(-25.040)	(-44.556)		
CF to Asset					-0.236***	-0.238***	-0.540***		
					(-6.781)	(-6.800)	(-6.795)		
Mean Ind. Leverage	0.555***	0.433***	0.851***	0.434***	0.408***	0.408***	0.740***	-0.054***	0.019***
	(67.223)	(114.354)	(121.828)	(130.560)	(95.954)	(96.001)	(88.534)	(-8.631)	(5.802)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Except for Japan and the UK (Cols. 2-3)			Additional Firm and Country-Level Variables (Cols 4-7)			Excess Leverage (Cols. 8-9)	
VARIABLES	**MktLev**	**LTD**	**MktLev**	**LTD**	**LTD**	**LTD**	**MktLev**	**ExcessLTD**	**ExcessMkt**
HHI					0.005***	0.005***	0.003		
					(3.291)	(3.056)	(0.953)		
GDP per Capita/	-0.091***	-0.072***	-0.071***	-0.071***	-0.032***	-0.045***	-0.111***	0.025**	0.003
100,000	(-9.068)	(-9.544)	(-5.132)	(-11.464)	(-3.823)	(-5.284)	(-6.793)	(2.112)	(0.502)
Enforceability of	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
Contracts	(-18.567)	(-14.046)	(-5.207)	(-11.577)	(-9.012)	(-7.890)	(-10.129)	(-12.583)	(-39.617)
Rule of Law	0.026***	0.016***	0.035***	0.027***	0.028***	0.025***	0.054***	0.003	0.001
	(7.630)	(7.702)	(8.222)	(14.371)	(8.971)	(7.963)	(8.752)	(0.884)	(0.754)
Government	0.005**	-0.008***	-0.016***	-0.013***	-0.017***	-0.019***	-0.000	0.016***	-0.008***
Effectiveness	(2.228)	(-4.658)	(-4.601)	(-11.352)	(-6.775)	(-7.348)	(-0.025)	(6.480)	(-6.638)
Creditors' Right	-0.000	0.001	0.007	0.004**	0.010***	0.009***	-0.022***	-0.005	0.011***
	(-0.080)	(0.483)	(1.280)	(2.570)	(5.418)	(4.773)	(-5.090)	(-1.569)	(7.141)
Stock Market	-0.013***	0.002***	-0.008***	0.004***	0.005***	0.005***	-0.002	-0.007***	-0.004***
Development	(-15.371)	(2.626)	(-6.655)	(8.153)	(6.165)	(5.713)	(-1.346)	(-6.311)	(-7.577)
R&D Exp Country					0.007***	0.006***	-0.056***		
					(4.848)	(4.501)	(-17.424)		
Inflation					-0.000***	-0.000***	0.002***		
					(-3.919)	(-4.107)	(6.916)		
Domestic Credit to					0.002	0.004	-0.034***		
Private Firm/GDP					(0.477)	(1.001)	(-4.327)		
Private Credit to GDP					-0.000***	-0.000***	0.000***		
					(-6.923)	(-6.704)	(4.952)		
Individualism				0.002***		0.002***	0.005***		
				(14.939)		(5.682)	(7.064)		
Uncertainty Avoidance				0.001***		0.000	0.002***		
				(6.152)		(1.152)	(4.045)		
Masculinity				-0.001***		-0.000	-0.001**		
				(-4.146)		(-0.896)	(-2.441)		
Long Term Orientation				-0.000**		-0.001***	-0.001*		
				(-2.141)		(-2.995)	(-1.821)		
Degree of					0.030***	0.024***	-0.036***		
Individualism					(7.345)	(5.915)	(-4.291)		
Degree of Hierarchy					-0.045***	-0.040***	-0.155***		
					(-3.502)	(-3.164)	(-5.050)		
Constant	-0.138***	-0.131***	0.022	-0.200***	-0.064***	-0.131***	0.018	0.014	0.009*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Except for Japan and the UK (Cols. 2-3)			Additional Firm and Country-Level Variables (Cols 4-7)			Excess Leverage (Cols. 8-9)	
VARIABLES	**MktLev**	**LTD**	**MktLev**	**LTD**	**LTD**	**LTD**	**MktLev**	**ExcessLTD**	**ExcessMkt**
	(-14.220)	(-20.207)	(1.632)	(-19.480)	(-5.773)	(-8.570)	(0.576)	(1.269)	(1.753)
Observations	238,514	156,118	155,750	238,593	170,608	170,608	170,299	238,235	238,653
Adjusted R^2	0.725	0.326	0.374	0.313	0.336	0.337	0.385	0.010	0.037
Ind FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 2.10. Endogeneity Test: Instrumental Variable (IV) Approach

This table presents the regression results of firm-leverage and country trust adopting an instrumental variable approach. The dependent variable is the long-term debt ratio. Trust is the percentage of WVS respondents saying they trust people they meet for the first time. $\widehat{\text{Trust}}$ is the predicted value of trust in the first stage of regression. Size is the natural log of the total assets (AT). Tangible is the Property, Plant, and Equip/AT. ROA is EBIT/AT. Growth Opportunity is the market-to-book ratio of the asset. Altman Z-score is calculated as: 3.3*(EBIT/AT)+1.0*(Sales/AT)+ 1.4*(RE/AT)+1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the average total leverage of 2-digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception to the extent that agents abide by the rules of society. Governance Effectiveness captures the perceptions of the quality of public services. Creditors' Rights are derived from Djankov et al. (2007). Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. I take Rainfall variation of a country as an instrument of social trust. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

	First-Stage	**Second Stage**	
Dependent Variable	**Trust**	**LTD**	
$\widehat{\text{Trust}}$		**0.408*** **	**0.373*** **
		(27.581)	**(29.060)**
Size		0.020***	0.020***
		(109.335)	(111.110)
Tangibility		0.063***	0.062***
		(27.815)	(27.318)
ROA		0.027***	0.026***
		(8.598)	(8.428)
Growth Opportunity		-0.002***	-0.001***
		(-7.141)	(-6.329)
RnD		-0.099***	-0.095***
		(-13.700)	(-13.266)
Altman Z-Score		-0.006***	-0.006***
		(-15.491)	(-15.342)
Mean Ind. Leverage		0.400***	0.407***
		(111.156)	(117.059)
Country-Level Controls		YES	YES
Rainfall Variation	0.076***		
	(85.710)		
Constant	0.222***	-0.182***	-0.129***
	(68.210)	(-43.082)	(0.00390)
Observations	234,882	234,882	234,882
Adjusted R^2	0.5454	0.184	0.202
F Stat	5,081.27		—
Industry FE	—	YES	YES
Year FE	—	NO	YES

Table 2.11. Endogeneity Test: Regression-Based on Propensity Score Matching

The sample contains 35,278 treatment and control firm-year observations from 17,639 matched pairs for the period 1990 to 2018. The propensity score matching method is used to generate the sample. I rank the trust annually based on the data in that year. Each year I make quartile portfolios and assign High Social Trust is equal to 1 if the trust is in the top quartile and assign 0 when the trust remains in the bottom quartile. Using logit regression to create the propensity score, I regress High Social trust as the dependent variable and all the controls of the baseline regression as independent variables. I use the predicted High Social Trust from the logistic regression and match the treatment group (High Social Trust = 1) with the control group (High Social Trust = 0) without replacement using caliper 0.001 as a matching criterion. After creating the propensity score-matched sample, I perform the same baseline regression. The dependent variable is the long-term debt ratio. $High_{Trust}$ is a dummy variable 1 if the social trust is in top quartile and 0 when trust is in the bottom quartile. Size is the natural log of the total assets (AT) in USD. Tangibility is the Property, Plant, and Equip/AT. ROA is EBIT/AT. Growth Opportunity is the market-to-book ratio of the asset. Altman Z-score is calculated as 3.3*(EBIT/AT)+1.0*(Sales/AT)+1.4*(RE/AT)+ 1.2*(WC/AT). RnD is R&D scaled by sales. Mean Ind. Leverage is the average total leverage of - digit SIC industry. The Enforceability of Contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception to the extent that agents abide by the rules of society. Governance Effectiveness captures the perceptions of the quality of public services. Creditors' Rights are derived from Djankov et al. (2007). Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	**(1)**	**(2)**
$High_{Trust}$	**0.013*****	**0.013*****
	(10.323)	**(5.495)**
Size	0.019***	0.019***
	(52.455)	(28.306)
Tangibility	0.048***	0.048***
	(8.739)	(5.379)
ROA	0.015**	0.015*
	(2.303)	(1.699)
Growth Opportunity	-0.000	-0.000
	(-0.383)	(-0.258)
RnD	-0.054***	-0.054**
	(-3.221)	(-2.125)
Altman Z Score	-0.004***	-0.004***
	(-6.478)	(-4.777)
Mean Ind. Leverage	0.406***	0.406***
	(55.157)	(34.985)
GDP per Capita/ 100,000	-0.048***	-0.048**
	(-3.749)	(-2.320)
Enforceability of Contracts	0.000***	0.000***
	(8.277)	(5.560)
Rule of Law	0.018***	0.018***
	(6.364)	(4.055)
Government Effectiveness	0.005*	0.005
	(1.868)	(1.246)
Creditors' Right	-0.004***	-0.004***
	(-6.328)	(-3.687)
Stock Market Development	0.008***	0.008***
	(5.566)	(4.261)
Constant	-0.109***	-0.109***
	(-11.850)	(-7.602)
Observations	35,058	35,058
Adjusted R^2	0.274	0.274
Ind. FE	YES	YES
Year FE	YES	YES
Clustering	NO	Firm-Level

Table 2.12. Analysis of Large Change in the Country Trust

This table summarizes the analysis of large changes in country trust on the change of leverage ratio. I use a change of five years of the long-term debt ratio as a dependent variable. $Large\Delta_5 Trust$ ($Small\Delta_5 Trust$) is a dummy variable 1 when the five years change of trust is in the top (bottom) tercile, 0 otherwise. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	$\Delta LTD5_{t+1}$	$\Delta LTD5_{t+1}$
$Large\Delta_5 Trust$ (β_1)	0.007***	0.005***
	(7.206)	(3.654)
$Small\Delta_5 Trust$ (β_2)	-0.004***	-0.003***
	(-5.269)	(-3.186)
Constant	-0.008***	-0.007***
	(-3.472)	(-3.153)
Difference Test: $\beta_1 - \beta_2 = 0$	**0.011*** **	**0.008*** **
T-stat	**9.521**	**4.666**
Observations	161,259	161,122
Adjusted R^2	0.003	0.006
Ind FE	NO	YES
Year FE	YES	YES
Clustering	NO	Firm-Level

Table 2.13. Trust and Leverage (Including U.S. Data with the Global Data)

This table presents the regression results of firm-leverage and country trust including U.S. data with the global sample. Trust is the percentage of WVS respondents saying they trust people when they meet for the first time. Panel A presents the regression results including the U.S. data with the global sample. I take the same instrument (rainfall variation of a country) of Table 10 to run the instrumental variable regressions in Columns 3 and 4. Panel B presents the regression results of firm-leverage and U.S. state-level trust. The dependent variable is the long-term debt ratio. $Trust_{US}$ is the measure of most people are trusted collected from Putnam (1993). Size is the natural log of the total assets (AT). Size_sqr is the square term of the size to capture the curvature. ROA is EBIT/AT. Market-to-book ratio is market value over book value of the asset. Tangibility is the Property, Plant, and Equip/AT. Mean Ind. Leverage is the average total leverage of 2-digit SIC industry. Altman Z is 3.3*(EBIT/AT)+1.0*(Sales/AT)+1.4*(RE/AT)+1.2*(WC/AT). RnD is R&D over sales. In Columns 2 and 4, I control for Size_sqr to capture the curvature as additional firm-level controls. Column 3 and 4 report the instrumental variable approach. I take the number of volunteered last year per capita and a measure of most people are honest as instruments of $Trust_{US}$. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**
	FE		**IV (Second Stage)**	**IV (Second Stage)**
Panel A: Including U.S. Data with the Global Data				
$Trust$	**0.034*****	**0.034*****		
	(15.598)	**(6.533)**		
$\widehat{Trust}$			**0.405*****	**0.405*****
			(29.401)	**(12.081)**
Firm-Level Controls	YES	YES	YES	YES
Country-Level Controls	YES	YES	YES	YES
Constant	-0.101***	-0.101***	-0.181***	-0.181***
	(-21.326)	(-12.140)	(-37.670)	(-15.880)
Observations	305,798	305,798	213,636	213,636
Adjusted R^2	0.275	0.275	0.194	0.194
Ind FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Clustering	NO	Firm-Level	—	—
Panel B: Only U.S. data				
$Trust_{US}$	**0.051*****	**0.045*****		
	(3.714)	**(3.260)**		
$\widehat{Trust}_{US}$			**0.033*****	**0.025*****
			(5.670)	**(4.296)**
Additional Firm-Controls	NO	YES	NO	YES
Firm-Level Controls	YES	YES	YES	YES
Constant	0.010	-0.056***	-0.062***	-0.156***
	(0.575)	(-2.956)	(-4.061)	(-9.009)
Observations	166,710	166,710	91,733	91,733
Adjusted R^2	0.173	0.178	0.177	0.183
Ind. FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Clustered SE	NO	Firm-Level	—	—
Hansen J-score			0.3158 (p-value = 0.574)	0.739 (p-value = 0.390)

CHAPTER III

ASSET TANGIBILITY AND CAPITAL STRUCTURE: A CROSS COUNTRY ANALYSIS

Introduction

It is well established that collateral (tangible assets) is a key determinant of capital structure across various economies.[53] The universality of tangible assets as a positive determinant of debt ratio has been shown to hold across various subsets of countries, e.g., G7 countries (Rajan and Zingales, 1995), ten developing countries by Booth et al. (2001), and 39 countries segregating by developed and developing economies by Fan et al. (2012). More recently, Oztekin (2015) examines factors that reliably determine the capital structure for global firms.[54] However, none of the studies explores the role of tangible assets in the context of the prevailing institutional heterogeneity.[55]

[53] Collateral has played significant role in the history of credit granting (Steijvers and Voordeckers, 2009). Though unsecured debt is fairly common now, collateral still plays a sizeable, and arguably even bigger and direct role in the granting of credit. For example, in the US, according to the National Survey of Small Business Finance (NSSBF), 30.3% of business loans were collateralized in 1998. The recent statistics reveals that the use of collateral is increasing, i.e., 45% of loans in 2003 were collateralized and 49% of the loans are collaterized by the business assets in 2020.

[54] Other prominent international capital structure studies that include collateral as a significant determinant are Antoniuo et al. (2008), Kayo and Kimura (2011), among others.

[55] Law and finance literature determines the formal and informal institutions, such as creditors' rights, financial development, corruptions, social trust, and so on, that can explain the financial and economic growth of a country. See also Liberti and Mian, 2010; Qian and Strahan, 2007; Demirguc-Kunt and Maksimovic, 1998; LLSV,1997.

Therefore, the lessons learned from one environment cannot be generalized to other countries where the institutions and culture are different. Though the existing literature is vast and rich in analyzing the direction of the association between collateral and leverage ratio, the analysis of how much variation of this association comes from country-level institutional heterogeneity remains unexplored. This paper attempts to examine the impact of asset tangibility on the capital structure by exploiting the cross-country institutional heterogeneity. To disentangle the association, I link two relevant literature streams- international capital structure and law and finance.

One of the central features of tangible assets is that they are inherently less informationally asymmetric and have higher recovery value (Liberti & Sturgess, 2018). Tangible assets are highly desirable to the creditors as a medium of collateral because it can be used as a monitoring device (Rajan and Winton, 1998). The law and finance literature provides evidence that some country-level institutional characteristics, e.g., creditors' rights, financial development, and so on, ease the lending and borrowing constraints and influence the capital structure decisions around the world (Demirguc-Kunt & Maksimovic, 1998; LLSV, 1997; Qian & Strahan, 2007; and among others). Thus, the presence of stronger institutional characteristics reduces the role of collateral because both stronger institutional characteristics and collateral serve the common purpose of reducing market friction and information asymmetry. Theoretically, the demand for collateral is likely different for firms located in the less financially developed countries due to the opacity of information and weaker enforcement (Bae & Goyal, 2009; Behr et al., 2011). Other formal and informal institutions, i.e., creditors' rights, country transparency, governance, and so on, may also alter the association between tangible assets and capital structure choice. In light of the above discussion, the sensitivity of asset tangibility with leverage ratio may strengthen or weaken depending upon the country-level factors that reduce or increase the market frictions and information asymmetry. Specifically, this paper aims to answer the following question: does the

magnitude of the association between tangible assets and leverage ratio vary with different institutional environments?

In light of the above discussion, I first develop a set of empirical predictions of how tangible assets associate differently with the leverage ratio given the heterogeneity of the institutional environment. I hypothesize that the association of tangible assets on leverage ratio is weaker if the firms are headquartered in strong institutional environments, i.e., stronger creditors' rights, better financial development, good country governance, and higher country-level transparency.

Using firm-year observations of 32 countries spanning from 1990 to 2018, I find that tangible assets are less positively associated with the capital structure in stronger creditors' rights countries. I find that the interaction effect between tangible assets and stronger creditors' rights on long-term debt ratio is -0.050, implying a less positive relation between leverage use and tangible assets for firms located in stronger creditors rights countries compared to weaker creditors' rights countries. I further find that tangible assets are less positively associated with leverage for firms located in countries with strong financial development. The interaction effect between tangible assets and strong financial development on market book leverage is -0.016, meaning that the association between tangible assets and leverage is less positive in stronger financial development countries than weaker financial development countries. Next, I examine the sensitivity of tangible assets to leverage conditioned on country-level governance and corruption or transparency. I argue that a country's governance and transparency act as informal institutions that may affect capital structure decisions. I find that tangible assets are less positively associated with leverage ratio for firms in strong governance and more transparent countries. Finally, I test the role of tangible assets on leverage during the crisis period. I argue that tangible assets' inherent characteristic of being less informationally asymmetric and higher recoverable value become more crucial especially during

the crisis period.[56] Thus, I hypothesize that tangible assets associate with leverage ratio more positively during the crisis period when lending constraints are higher. However, stronger institutional characteristics help to ease the lending constraints when the overall market is in crisis. In this situation, the association between tangible assets and leverage becomes less positive for firms headquartered in the stronger institutional environments. Consistent with this belief, I find that the association between tangible assets and leverage is more positive during crisis periods, but this association moderates when firms are headquartered in stronger institutional characteristics.

The cross-country approach to examining the association between tangible assets on leverage makes it possible to study the effect of differences in legal environments. This analysis fits into both the international capital structure literature and law and finance literature. This paper contributes to our understanding of international capital structure and law and finance studies in at least two ways. First, to my best knowledge, this is the first study that disentangles the magnitude of the association between tangible assets and leverage using a cross-country sample. I argue that strong country-level institutional characteristics reduce the market frictions that eventually mitigate the lending and borrowing constraints. According to the supply-side view of capital structure, asset tangibility and redeployability are the primary drivers of leverage when credit frictions are high (Campello & Giambona, 2013). Thus, the expected association between asset tangibility and leverage is not uniform for all firms in differential institutional environments. my study is different from previous international capital structure studies of Antoniou et al. (2008), Booth et al. (2001), Fan et al. (2012), Oztekin (2015), and Rajan & Zingales (1995) because these studies do not disentangle the association of tangibility and leverage with the institutional heterogeneity of a country. Further, I supplement Campello and Giambona (2013) by considering country-level frictions while they investigate firm-level frictions that create financing constraints to test the

[56] The U.S housing crisis of 2007 to 2010 contributed to the global financial crisis. The crisis had severe long-lasting consequences for the U.S and European countries. Thus, I define crisis period from the year 2007 to 2010.

magnitude of the association between collateral and leverage ratio. Second, I contribute to the law and finance literature. According to the literature, some institutional characteristics, such as creditors' rights, financial development, transparency, foster economic development. Thus, firm's leverage ratio increases due to the ease of access to external financing. Collateral is one of the most important determinants of the capital structure that can mediate the lack of any institutional characteristics; thus, the association of collateral on leverage is stronger if firms headquartered in the weaker institutional environment countries.

The paper is organized as follows. In section 3.2, I survey the existing literature and develop the hypotheses. Section 3.3 presents the data and sample statistics. Section 3.4 discusses the results of the tangible assets' role as a determinant of capital structure across varied institutional environments. Section 3.5 provides additional results that take into account endogeneity concerns. Finally, section 3.6 concludes the paper.

3.2. Literature Review and Hypothesis Development

The aim is to contribute to two different streams of literature; thus, I discuss the pertinent literature segregated into these areas: international capital structure and law and finance.

3.2.1. International Capital Structure

Perhaps the study of Rajan and Zingales (1995) is the first that tests the reliable factors of capital structure from a global perspective. The study uses the data from seven G7 countries and analyzes the capital structure determinants based on the existing theories.[57] Though different from each other, the characteristics of the G7 countries are more similar than dissimilar because they all

[57] The G7 countries include the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada.

belong to developed countries. The focus of the study is to determine the association of the fundamental factors that affect firm leverage choice when the countries are different in accounting standards, tax treatment, bankruptcy law, and creditors' rights, although they do not explicitly control for these institutional differences nor do they look at how these institutional differences moderate the capital structure determinants. They find that the association between tangible assets and book leverage ratio is higher for Japanese firms than for any of the other six countries. They argue that this association is higher for Japanese firms because Japan's land value was appreciated during the 1980s. Thus, Japanese firms are able to borrow more because of the higher collateral value. In another study, Booth et al. (2001) examine the determinants of capital structure for 10 developing countries. Though they argue that the financial leverage decisions differ significantly between developed and developing countries, they find that the determinants are almost the same as the developed countries. However, the magnitude of associations is heterogeneous in different countries. The variation of association results from the differential tax treatment, bankruptcy process, and many others. With regard to tangible assets, they find that the association is positive with the long-term debt ratio, while the association is negative for the total debt ratio but as this was not the focus of the paper no explanation was provided. Using a broader dataset, Fan et al. (2012) segregate the data into two major categories: developing and developed countries. They assess the determinants of the capital structure for these two groups and find the association between tangible assets and leverage ratio is higher for the developed countries.

3.2.2. Law and Finance

The difference in laws in various countries might explain why firms from different countries use different financing sources. According to LLSV (1998), the law varies considerably across countries, perhaps due to the heterogeneous legal origin. In their seminal paper, LLSV (1998) document that country's legal system influences its bank credit level and its stock market development. They further document that the common law countries are more likely to have a more

developed equity market than civil law countries. The well-developed markets attract firms to invest more by financing from the equity market. LLSV (1997) find that countries with poorer investors' protection laws are associated with smaller and narrower capital markets.

Besides legal origin there are other relevant institutional characteristics including strong financial markets, transparency, and so on. LLSV (1997) document a positive association between stronger investor protection rights and financial development, while Rajan and Zingales (1998) find that financial development facilitates economic growth. Liberti and Mian (2010) show that institutions that promote financial development also ease the financial constraints and lower the credit spread. They find that financial development reduces the collateral cost and collateral spread. More to the point, financial development enables firms to pledge a broader class of assets as collateral. The association is due to the better legal protection and stronger creditors' rights that enable lenders to seize and liquidate specialized forms of assets more efficiently. Moreover, countries' laws shape the association between collateral and leverage ratio. Calomiris et al. (2016) find that loan to values of collateral is lower for firms located in the weak collateral law countries.

One of the important institutional characteristics of a country is the creditors' protection. Djankov et al. (2008) analyze the impact of creditors' rights on the private credit of 129 countries across the world. They find that countries with stronger creditors' rights are associated with a more positive private credit to GDP ratio, and the association is stronger for richer countries. In another study, Gu and Kowaleswski (2015) examine the association between creditors' rights and corporate bond markets. They find that stronger creditors' rights are associated with more developed corporate bond markets. LLSV (1997) and Demirguc-Kunt and Maksimovic (1999) study the impact of institutional characteristics on capital structure choice and, among other things, document a positive association between creditors' protection and use of financial leverage.

3.2.3. Hypothesis Development

Previous literature primarily focuses on how tangible assets mitigate firm-level market frictions to facilitate debt capacity, but its implication on the country-level frictions has received little attention. The use of international data provides a unique opportunity to test whether country-level factors influence the association between firm-level factors, asset tangibility in this case, and leverage ratio. The impact of different institutional structures is important because they may affect the country's cross-sectional correlation between leverage and firm-level factors, such as asset tangibility. I argue that country-level factors are an important driving force in debt contracting that may moderate the association between firm-level characteristics on leverage ratio. First, higher creditors' rights offer greater protection to the lenders that eventually advance financial development (Djankov et al., 2007). I argue that creditors' rights increase creditors' bargaining powers; thus, it lowers creditors' monitoring need (Jayaraman and Thakor, 2013). On the other hand, Rajan and Winton (1995), Ono and Uesugi (2009) argue that the collateral can be used as the monitoring device. Costello (2019) argues that collateral rights decrease suppliers' incentives to monitor. Thus, both stronger creditors' rights and collateral serve the same purpose: as a monitoring device. In light of the above discussion, I hypothesize that tangible assets are associated more positively with leverage when firms are headquartered in the weaker creditors' rights countries.

H1. The association of tangible assets with leverage is less (more) positive when creditors' rights are strong (weak).

Financial development can mitigate market friction by increasing the level of credit and the capital market's capacity (Rajan & Zingales, 1998) that eventually lessens the moral hazard and adverse selection problem. In other words, financial development is stimulated by institutional developments, which ultimately ease the lending and borrowing constraints resulting in reduced cost of capital (Qian & Strahan, 2007; Liberti & Mian, 2010). Previous literature shows how

financial development leads to industrial growth (Demirguc-Kunt & Maksimovic, 1998; Rajan & Zingales, 1998). Moreover, financial development promotes a credit market that eventually cultivates lender-borrower associations. Thus, the absence of strong financial development creates another type of market friction that makes debt financing expensive. I argue that the presence of tangible assets reduces this type of market friction and increases debt capacity. Hence, I hypothesize that the association of tangible assets with leverage is stronger in weaker financial development environments than stronger financial development environments. I argue that firms located in stronger financial development countries rely less on tangible assets than firms in weaker financial development countries.

H2. Other things remaining the same, the association of tangible assets and leverage is less (more) positive for firms located in stronger (weaker) financial development countries.

According to La Porta et al. (1996), the country-level governance indicators, such as the judicial system, anti-corruption efforts, voting rights, accountability, and political stability, improves countries' economic development. Other studies show that firm policy and risk-taking decisions are also determined by the country-level governance variables (John, Litov, & Yeung, 2008). Previous capital structure literature also emphasized the importance of a country's legal environment, such as firms using more leverage if they are headquartered in stronger formal institutional environments (Cheng & Shiu, 2007). I suggest that tangible assets and governance are both substitutable with each other because both ease lending constraints. Thus, the importance of tangible assets in the capital structure policy is less prominent for firms that are headquartered in strong country-level governance economies. Consistent with this perception, I hypothesize that

tangible assets associate less positively with the leverage ratios if firms are located in strong governance countries.

H3. Other things remaining the same, the association of tangible assets and leverage is less (more) positive for firms located in stronger (weaker) governance countries.

Another cross-country market friction is transparency. By country-level transparency, I mean the availability and reliability of information about a country's public and private sectors. A country is transparent when the business and government practices are open, the power is well-distributed, social trust is higher, and there exists a low level of corruption. Country-level transparency lowers the information asymmetry as Stiglitz (2000) argues transparency is another name of information, so greater transparency becomes a way of minimizing information asymmetry in the market. Transparency has been shown to attract capital, reduce capital market volatility, and lessen the severity of the financial crisis (Gelos and Wei, 2005). They also state that during volatile times, international investors may be more likely to rush into the less opaque countries (International Monetary Fund, 2001). Higher country-level transparency acts as an invisible institution that decreases the information asymmetry and lowers banks' risk-taking (Houston et al., 2010). Jensen and Meckling (1976) state that agency cost between lenders and managers arises when the potential for asset substitution is higher. The asset substitution problem may become more acute in less transparent countries because of less effective monitoring and governance. I argue that macro-level transparency promotes financial development and encourages both lenders and borrowers to engage in debt contracting. I further argue that lenders place greater reliance on tangible assets to overcome deficiencies associated with less transparency. Thus, the higher proportion of fixed assets complements the lack of transparency in the country.

H4. Other things remaining the same, the association of tangible assets and leverage is less (more) positive for firms located in more (less) transparent countries.

3.3. Data and Sample Description

3.3.1 Data

The sample consists of firm-level data from the COMPUSTAT Global database for the years 1990 through 2018. COMPUSTAT Global database contains accounting data for countries other than North America (the U.S. and Canada) with over 24,000 firms.[58] I use a series of country-level control variables collected from a variety of sources. Country-level governance data is collected from World Governance Indicators (WGI).[59] Among other country-level factors, the following factors are collected from World Development Indicators (WDI), i.e., GDP, stock and bond market development, inflation, and time required for enforceability.[60] The creditors' rights data is from La Porta et al. (1997) and Djankov et al. (2007). Creditors' rights index ranges from 0 to 4, where 0 represents the weakest rights and 4 represents the strongest. Each of the four components adds 1 to the index value if the component is present in the country. The components of creditor rights are as follows: MGMT_NOT_ STAY (captures the ability of creditors or courts to replace the incumbent management during bankruptcy), NO_AUTOSTAY (equals one if the bankruptcy code prohibits an automatic stay on assets), RESTRICT_REORG (equals one if the bankruptcy code prevents management from unilaterally filing a reorganization plan), and SECURED_FIRST (equals one if secured creditors' claims are given absolute priority relative to the government or employee claims). Finally, I use the mergers and acquisition data from SDC platinum to calculate a measure of asset redeployability.[61]

[58] In case I find any North American firms in the study, I drop them.
[59] Almost 200 countries that report the aggregate and individual governance indicators are recorded in the WGI project. I collect six variables from the database: Voice and Accountability, Political Stability, Governance Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.
[60] WDI reports time-series governance data for 217 countries.
[61] I use SDC platinum to calculate the historical mergers and acquisition transaction value of the completed mergers and acquisition deals. I obtain the value of all M&A activity involving publicly traded targeted firms in each of the 3 digit SIC industry and year from SDC. The details of the variable are in Appendix B.1.

The raw data sample in the study includes 662,933 international firm-year observations from the COMPUSTAT Global database. I then apply a series of filters. Following Morellec et al. (2018) and other international studies, I drop all the regulated utilities (SIC 4900-4999) and financial firms (SIC 6000-6999). I also drop firm-year observations from the study if the key variables, e.g., cash, tangibility, total asset, cash-flow, total book leverage, total debt, are missing. I also exclude firm-years if cash, total assets, and sales are reported with negative values. I also eliminate firms with excessive debt ratios that are likely due to reporting errors. Specifically, I drop firms with ratios that exceed one for the following leverage measures: long-term debt ratio, short term debt ratio, and total debt ratio. To keep the sample free from small firm bias, I exclude firms if the total assets' value is less than USD 1 million on an inflation-adjusted basis relative to 2004, the midpoint of the database. Consistent with other international studies, I eliminate countries with too few firms and firm-year observations. I exclude countries with less than 50 firm-year observations and less than 25 unique firms reported in a given year. Finally, I only consider countries included in the La Porta et al. (1997), the source of data for creditors' rights. The final sample comprises of 239,730 firm-year observations ranging from 1990 to 2018 of 32 countries.

3.3.2. Sample Descriptive Statistics

Table 3.1 reports the country-wise summary statistics of the asset tangibility and leverage ratios. Asset tangibility is the ratio of property, plant, and equipment scaled by total assets. I use three leverage ratios: long-term debt ratio (long-term debt scaled by total assets), total debt ratio (long-term plus short-term debt scaled by total assets), and market leverage ratio (total leverage scaled by the market value of firms). Firms from Japan, India, UK, and Australia make up the largest proportion of sample observations. The highest number of observations comes from Japan accounting for 25.53% of firm-year observations, and Japanese firms possess a comparatively lower percentage of fixed assets in their asset portfolio. The use of leverage in Japan is comparatively low as well. Almost 10.5% of the financing comes from long-term debt, and 23.1%

of the capital is from debt financing. The sample's second-largest representation comes from India, with 22,689 firm-year observations accounting for 9.50% of the total sample size. Indian firms also possess more fixed assets than the mean value and use 14.50% and 28.60% long-term debt and total debt ratio in the capital structure, respectively. On the other hand, firms from Peru retain 50% of the total assets portfolio as fixed assets. Surprisingly, these firms use less debt in the capital structure. Indonesian firms use the most debt in the capital structure, and these firms retain a higher level of fixed assets as well.

Table 3.2 reports the summary statistics of selected variables categorized by creditors' rights. I find an almost monotonic negative association between creditors' rights and long-term debt ratio. The higher the creditors' right, the lower the long-term debt ratio, which is consistent with previous findings of Cho et al. (2014). On the other hand, the tangible asset ratio does not associate with the creditors' rights. I find that firms belonging in the highest and lowest creditors' rights environments use less fixed assets than firms in the moderate creditors' rights environment. Presumably, firms belonging to the higher creditors' rights environment use less tangible assets because higher creditors' rights facilitate easy access to credits with affordable collateral conditions. On the other hand, weak creditors' rights may discourage lenders from extending loans with collateral as the lack of creditors' rights increases the liquidation cost. Table 3.3 provides further clarification of this association. Liquidation rights afford the lenders the authority of liquidating the fixed assets when the firms become distressed. Table 3 reports that the higher the liquidation right, the less the long-term debt to tangibility ratio is. This intuitively suggests that lenders in the higher liquidation environment demand more collateral to issue long-term debt. The higher liquidation right facilitates lenders repossessing the fixed assets and liquidating them to recover the loan if the firms become distressed.

Table 3.4 shows the relation between tangible assets ratio and long-term debt ratio categorized by colonial region or legal origin. I find that English origin countries possess a higher

proportion of fixed assets at 32.8%, whereas the Nordic firms use the least at 25.6%. Noticeably, though the Nordic firms possess less tangible assets, they use more long-term debt in the capital structure. These firms use almost 15.7% long-term debt in their capital structure, while English-origin countries use 10.6% long-term debt on average. French firms possess the second-highest proportion of tangible assets in the asset portfolio. On average, these firms own 30.5% of tangible assets and use 13.1% of long-term debt in the capital structure.

Table 3.5 reports the descriptive statistics of the key variables used in the regression analyses. The mean (median) total value of assets in USD is 1,560.83 (173.33) million. On average, the proportion of fixed assets in the sample is 0.308, while the median value is 0.279. The sample firms are growth firms with a mean market to book value of 1.478 and a median value of 1.096. The proportions of short-term debt and long-term debt are almost identical. On average, the long-term debt ratio is 11.1%, while the mean short-term debt ratio is 10.8%. Almost 22.2% of capital is raised from debt, and the 50th percentile of the debt ratio is 19.6%.

3.4. Methodology and Results

3.4.1 Basic Model

To investigate how tangible assets associated with leverage, I estimate variants of the following model:

$$Leverage_{i,t+1} = \alpha + \beta_1 TangibleAssets_{i,t} + \beta_2\, IE + \beta_3\, TangibleAssets_{i,t} \text{ x } IE + \gamma\, Controls_{i,t} + d_i + d_t + \epsilon_{i,t} \quad (3.1)$$

Where $Leverage_{i,t+1}$ is the firm *i*'s long-term debt ratio, book leverage, or market leverage at year *t+1*. $TangibleAssets_{i,t}$ represents the proportion of fixed assets in the asset portfolio. IE (Institutional Environment) is the proxy for formal and informal institutions, e.g., creditors' rights, financial development, governance, and transparency. γ in the above equation represents the coefficients of the control variables. Consistent with Frank and Goyal 2009; Oztekin, 2015; Rajan and Zingales 1995, and many others, I initially use 13 firm, industry, or country-level control variables. The firm-level controls are size, return on asset, growth opportunity, R&D expenditure, and distress measure. Mean industry leverage is the only industry-level control variable. Country-level controls include GDP per capita, enforcement of law, the rule of law, governance effectiveness, creditors' rights, and stock market development. The variable descriptions are provided in *ndix B.1*. d_i denotes the firm or country level fixed effects and d_t represents year fixed effects, and $\epsilon_{i,t}$ is the white noise or firm-level clustered robust error with mean zero and standard deviation of 1.[62]

In estimating the above model, I address potential endogeneity due to missing unobserved variables and reverse causality. As noted above, in the base model, I consider firm and year fixed effects that take care of firm and year level unobserved fixed components. I acknowledge that taking fixed effects does not mitigate the endogeneity problem entirely. Hence, I consider an instrumental variable approach to address the endogeneity issue further.[63] I detail this in section 5.

Columns 1 to 3 of Table 3.6 present baseline estimates of equation (1) using long-term debt ratio as the dependent variable but excludes the interaction term. The columns differ in the

[62] I did not consider industry fixed effect in the models as the firm and country-level fixed effects sufficiently capture the time-invariant missing variables in the model. Including the industry fixed effect in the same model will make the model multicollinear. For robustness, I test the industry fixed effect along with year fixed effect in a separate model and end up with consistent results.

[63] Following Ortiz Molinnna and Phillips (2014), I take the following instruments: Financial Slack, and Total M&A activities in the industry, and mean industry tangible assets. The details of the variable description are in the Appendix B.1.

combination of fixed effects applied. As expected, I find the association between tangible assets and leverage is positive and significant at a 1% level in all the columns. I report the inter-quartile range (IQR) change effects on the leverage in the square bracket. The row displays the percentage change in leverage relative to its sample mean if tangibility increases from the 25th percentile to the 75th percentile. In column 3, I find that the coefficient for tangible assets is 0.0815, meaning that if the tangible assets ratio increases from the 25th percentile to the 75th percentile (1-IQR change), the long-term debt ratio changes by 2.58% (0.0815 x 0.316), which is a 23.20% (2.58%/11.1%) increase relative to the sample mean leverage of 0.111. The result is both economically and statistically significant at 1% level. Columns 5 and 6 report model estimates where the dependent variables are total book leverage and market leverage, respectively. I find that the association of tangible assets and leverage is positive and significant economically and statistically at the 1% level. Economically, if tangible assets increase by 1-IQR, then the total leverage changes by 16.44% and the market leverage changes by 14.35%. These findings support the previous evidence that tangible assets positively associate with the leverage ratio (Campello & Giambona, 2013; Ortiz-Molina & Phillips, 2014).

Next, I discuss the association between leverage and some of the control variables. Consistent with Oztekin, 2015, I find that firm size and industry leverage are positively associated with the long-term debt ratio. The positive association re-affirms the notion that the larger firms use more long-term debt because of being transparent, having a lower cost of debt (Byoun, 2008), being more diversified, and having lower bankruptcy costs (Titman & Wessels, 1988). I find that more profitable, higher growth, more innovative, and less distressed firms use less long-term debt in the capital structure. Overall, the results are consistent with the existing literature.

Firms' financing decision is also contingent upon other industry and country-level factors besides the firm-level factors. The results offer consistent findings with prior literature. I find leverage is positively associated with mean industry leverage and the rule of law, along with stock

market development. Thus, the result affirms the effectiveness of the rule of law of a country on leverage decisions. The better rule of law promotes firms to use more long-term debt. However, I find some surprising evidence of a negative association between leverage and governance quality, perhaps, due to the stronger correlation among the country-level factors.

3.4.2 The Association of Leverage and Tangible Assets Under Different Formal and Informal Institutions

3.4.2.1. Creditors' Rights

By creditors' rights, I mean how easily creditors can repossess assets to liquidate in default or take measures to re-organize the firms. As argued in the hypothesis section, higher creditors' rights can moderate the demand for collateral from creditors. In stronger creditors' rights environments, creditors have greater bargaining power over firms in distress, which eventually reduces market friction.[64] Under this scenario, collateral reliance as a safety valve should be less in a stronger creditors' rights environment. Table 3.7 estimates equation 1 with a creditors' rights dummy variable and an interaction term with tangible assets. Columns 1 to 3 report the association between the three leverage ratios and tangible assets and tangible assets' interaction with stronger creditors' rights dummy. I find that the interaction terms between creditors' rights and tangibility are negative across all three leverage ratios. In column 1, the negative interaction coefficient suggests that tangible assets are less associated with the long-term debt ratio in stronger creditors' rights countries compared to their weaker creditor rights' counterparts. The results imply that when tangible assets increase from the 25th percentile to 75th percentile (1-IQR change), the long-term debt ratio changes by 1.90% ((0.110-.050) x 0.316). On the other hand, for firms located in the

[64] According to La Porta et al. (1997), creditors' rights ranges from 0 to 4, and it has four components: MGMT_NOT_ STAY, NO_AUTOSTAY, RESTRICT_REORG, and SECURED_FIRST. Strong creditors' rights dummy is 1 if creditors right is either 3 or 4, and 0 otherwise.

weaker creditors' rights countries, the long-term leverage increases by 3.47% (0.11 x 0.316) if the tangible assets increase by 1 IQR. The results are robust if I consider other types of leverage ratios.

3.4.2.2 Financial Development

Financial development promotes credit markets that cultivate lender-borrower associations. As I argued earlier, financial development reduces market frictions enabling more robust and lower-cost credit markets. Thus, the importance of tangible assets in alleviating market frictions is less pronounced in countries with strong financial development. Consequently, I expect the association between tangible assets and leverage to be weaker (stronger) for firms located in stronger (weaker) financially developed countries. The findings in table 3.8 report the interaction effect between strong financial development and tangible assets on the leverage ratios.[65] Columns 1 to 3 report the interaction effect using different measures of leverage. The hypothesized effect is observed only in the case of market leverage and not in the other two measures. In column 3, I find that the interaction between tangible assets and strong financial development is negative, suggesting that tangible assets associate less positively with market leverage ratio, which is consistent with hypothesis *H2*. More specifically, the market leverage ratio increases by 4.00% if tangible assets increase from the 25th percentile to the 75th in strong financial development countries. In comparison, the association is 4.51% when firms are headquartered in weak financial development countries.

3.4.2.3 Governance:

Table 3.9 reports results of *H3* by including the interaction effect of tangible assets with the country-level measure of Governance Quality.[66] To implement the test, I create a strong governance

[65] Strong financial development is a dummy variable if the financial market development value is above the mean value, 0 otherwise.

[66] I collect governance data from World Governance Indicators (WGI). WGI reports the percentile rank of each of the six indicators: Voice and Accountability, Political Stability, Governance Effectiveness,

dummy ($Strong\ Governance$) equal to 1 if the governance index is above the median value, and 0 otherwise. I find that the interaction between tangible assets and the strong governance dummy is negative across all three leverage measures, though the results are not statistically significant in the case of market leverage. For columns 1 and 2, the interaction term between tangible assets and strong governance is negative and significant at the 1% level, supporting hypothesis *H3.* More precisely, from Column 1, the coefficient of the interaction term is -0.016, meaning that if tangible assets increase from the 25th percentile to the 75th percentile (1-IQR change), the long-term debt ratio changes by 2.27% (0.072 × 0.316) for the firms in the strong governance countries. On the other hand, the long-term debt changes by 2.78% by a one IQR change of tangible assets in weak governance countries. Using the book leverage ratios, the results are significant both statistically and economically, supporting the hypothesis that the association of tangible assets with leverage is less pronounced for firms in countries with strong governance.

3.4.2.4 Transparency

Table 3.10 reports the regression results of tangible assets and interaction with more country-level transparency on the leverage ratio. I collect the country transparency data from the website of Transparency International. Transparency International reports global country-level transparency index. The reporting scheme has been changed after the year 2012; thus, the index is not comparable in the pre and post-change regimes. Hence, I create a percentile index for each country each year, which is comparable year by year.[67] In all the models, the interaction variables are negative and statistically significant. Column 1 reports that the interaction between tangible assets and more transparent country dummy is -0.029. Economically, a one IQR change of tangible

Regulatory Quality, Rule of Law, and Control of Corruption. To calculate the governance index, I take the average of the percentile rank of all the governance indicators.

[67] According to the Transparency International, corruption is defined as: "1. Public servants demanding or taking money or favors in exchange for services. 2. Politicians misusing public money or granting public jobs or contracts to their sponsors, friends, and families. 3. Corporations bribing officials to get lucrative deals."

assets is associated with an approximately 2.43% increase of long-term debt in more transparent countries, while the association is 3.34% in less transparent countries. Column 2 reports that the interaction coefficient between tangible assets and more transparency dummy is negative 0.023, meaning that the total leverage changes by 3.50% if tangible assets change by 1 IQR in more transparent countries. In the last column, I report the coefficients of market leverage. More specifically, the market leverage increase by 3.70% if tangible assets change from the 25th percentile to the 75th percentile. On the other hand, the market leverage increase by 5.31% by a one IQR change of tangible assets in more transparent countries.

3.5. Endogeneity and Robustness Test

3.5.1. Endogeneity

Endogeneity concern is common but serious in corporate finance studies. In this study, I address the potentiality that the decision of a firm's leverage and possession of tangible assets may be endogenously associated with each other. The endogeneity may arise due to omitted variables or reverse causality. To tackle this concern, I use an instrumental variable (IV) method taking the instruments following Ortiz-Molina and Phillips (2014).

I take three instruments for tangible assets: Total M & A activity of the firm's industry ($TotM\&A$), financial slack of the competitors ($MNLPOTBUY$), and mean industry tangible assets. First, $TotM\&A$ captures how much M&A transactions occur in the firm's industry in a given year. The intuition to add this variable as an instrument is because higher M & A transactions in an industry correspond to higher asset liquidity. Thus, asset liquidity decreases the transaction costs of tangible assets during financial distress, which makes tangible assets appealing due to their higher liquidation value. I collect M&A transaction data from SDC platinum. Following Ortiz-Molina and Phillips (2014), I consider only the completed deals. Second, the financial slack of the

competitors increases the resale value of the tangible assets. The higher the competitors' financial slack ($MNLPOTBuy$), the higher the demand of the tangible assets if a particular firm is in distress. I take the minus average book leverage of the rivals in the industry (3 digits SIC code industry) averaged over the previous three years on a rolling basis. Lastly, I also use mean industry (FF 49 industry) tangible assets ($MeanIndTang$). The intuition of including the industry average tangible assets is because of its low correlation with firm's leverage ratio and its high correlation with a firm's tangible assets. I expect positive signs for all the instruments in the first stage.

Table 3.11 reports the base regression results using the instrumental variables method.[68] In the first stage, I find that the directions of the instruments are consistent with the predictions. I find that coefficients of both $MNLPOTBuy$ and $MeanIndTang$ are positive and significant. To validate the instruments, I adopt three parameters. First, the R^2, which is higher than the 20% level. Second, F-stat is also well above the threshold level of 10.00. Third, the Hansen J test could not reject the null hypothesis meaning that the instruments are exogenous. I also report the second stage of the 2SLS instrumental variable regression. Columns 1 to 3 report the interaction between tangible assets and strong creditors' rights dummy variables. I find that the results are robust with the main results that I find in table 7. Columns 3 to 6 present the interaction effect of tangible assets and strong financial development. Consistent with the previous finding, I find the interaction coefficients are negative. Columns 7 to 9 report that the interaction coefficients of predicted values of tangible assets and strong country governance are negative, meaning that the association between tangible assets and leverage is less positive in stronger governing countries. In columns 10 to 12, I report the interaction effect of tangible assets with more country transparency dummy and find

[68] Ortiz-Molina and Phillips (2014) use US firms in their observations. In their study all three instruments are positively associated with tangible assets. However, in my first stage regression, I also got positive association except one insignificant coefficient in the case of $TotM\&A$. This could be because merger and acquisition data for many countries may not be as comprehensive as for the US. However, the second stage regression results are robust with the previous findings.

the associations are negative, consistent with previous findings. Overall, the results are robust with the findings throughout the study.

3.5.2. Crisis Period

In this section, I use the global crisis period as a potential exogenous shock to test the robustness of findings. In the aftermath of the global financial crisis, the use of collateral backed secured debt increased substantially.[69] Access to credit became more constrained during the crisis. The prime reason for the scarcity of credit is greater information asymmetry. In this situation, firms with collateral (tangible assets) maybe more appealing as they are less information asymmetric potentially enhancing their borrowing capacity (Hart and Moore, 1994). Thus, the association of tangible assets with leverage is hypothesized to be more positive during the crisis period due to the higher uncertainty level. I argue that the association between tangible assets and leverage during a financial crisis will be less positive for firms headquartered in stronger institutional environments, such as stronger creditors' rights, stronger financial development, and higher country-level transparency.

Table 3.12 shows the association between tangible assets, leverage ratios, and crisis period in the heterogeneous institutional environment. The results show that the association of tangible asset on leverage is stronger during the crisis period in all columns. In columns 1 to 3, the triple interaction term, $CrisisDummy * Tangibility * StrongCreditorsRights$ is negative, meaning that even though tangible assets play a prominent role during the crisis period, the association is less positive if firms are headquartered in the strong creditors' rights environment. In columns 4 to 6 focusing on financial development country, I find that the triple interaction coefficients are negative and significant for total book leverage and market leverage. Consistent with prior results,

[69] Corradin, Heider, and Hoerova (2017) state that the use of collateral, in European bond market, to back financial transaction increases from 60 percent to 90 percent from pre-crisis to post-crisis periods.

in columns 7 to 9, I find that the association between leverage and tangible assets is less strong for firms in stronger governance countries during the crisis periods. Lastly, columns 10 to 12 report the association between tangible assets and leverage for the more transparent countries during the crisis period. I find robust evidence that the role of tangible assets in the leverage decision is less prominent for firms of more transparent countries during the crisis period.

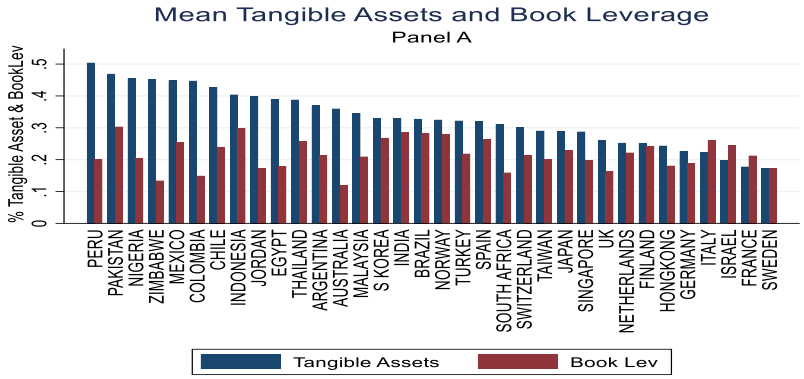
3.6. Conclusion

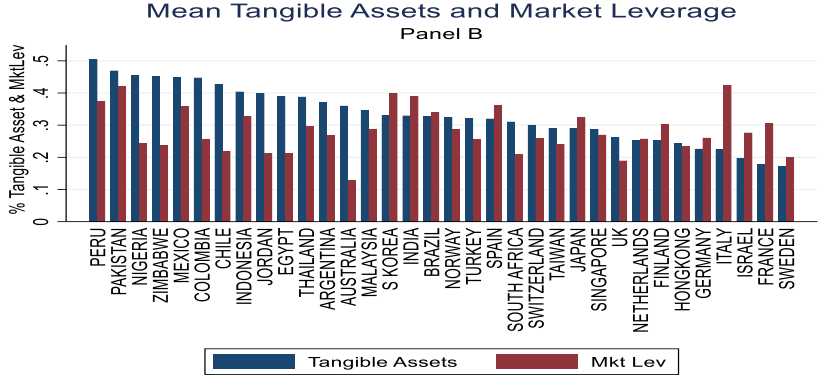
This study argues that the association of tangible assets with the leverage ratio is not uniform, but it varies from country to country due to institutional heterogeneity. The study contributes to both the international capital structure literature as well as the law and finance literature. Previous international capital structure studies only examine the direction of the association between tangible assets and leverage. Since tangible assets are considered as the single most important determinant of the capital structure (Campello & Giambona, 2013), the association of tangible assets on leverage needs to be further explored. In this study, I disentangle the association in a global context with heterogeneous institutional environments.

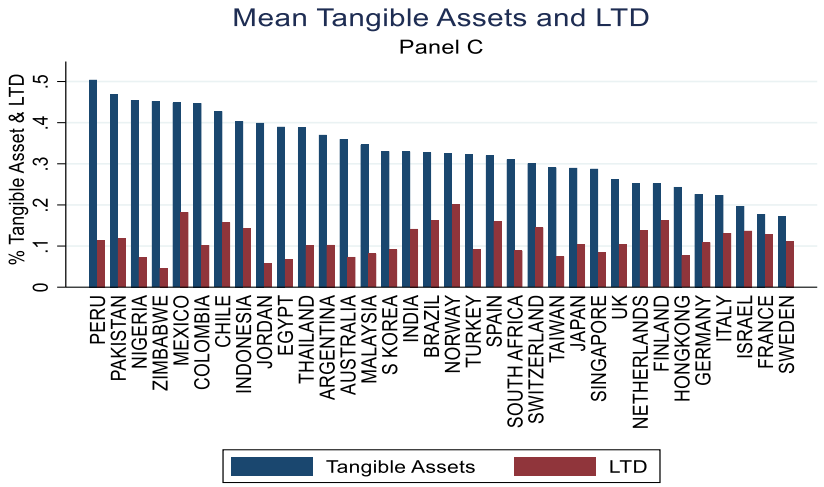
I find that the association of tangible assets with the leverage is less positive for firms located in stronger creditors' rights, stronger financial development, stronger governance, and more transparent countries. The findings are consistent with the viewpoint that the association is less positive in these countries because of the reduced market frictions and lower informational asymmetry. Lastly, I also analyze the association between tangible assets and leverage during the crisis period and how the magnitude of associations varies if firms headquartered in heterogeneous institutional environments.

Figure 3.1. Tangible Assets and Leverage (each Categories)

This figure presents the mean tangible assets and leverage ratio. Panel A, B, C, and D report the Total Leverage, market leverage, long-term debt ratio, and short-term debt ratio with tangible assets in each country from year 1990 to 2018.







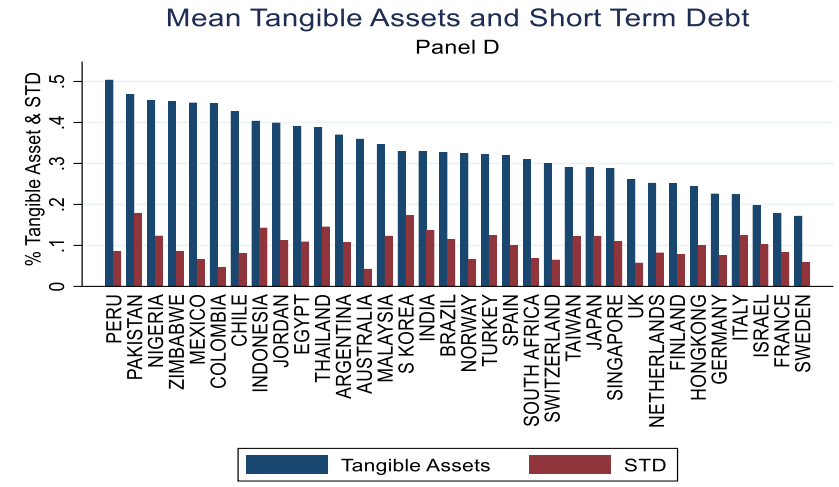


Table 3.1. Descriptive Statistics: By Country

This table presents the mean value of variables for each country. TotalLev is (Long-term debt+ Short Term Debt)/AT. LTD is long-term debt scaled by total assets. MktLev is (Long-term debt+Short-term debt)/(DLC+DLTT+MktEqu). $TangibileAsset$ is property, plant, and equipment scaled by total assets. N represents the total number of firm-year for this sample country.

	$TangibileAsset$	TotalLev	LTD	MktLev	N
ARGENTINA	0.385	0.217	0.107	0.274	798
AUSTRALIA	0.340	0.129	0.083	0.142	17106
BRAZIL	0.338	0.286	0.167	0.340	2951
CHILE	0.431	0.240	0.158	0.220	1559
COLOMBIA	0.448	0.147	0.100	0.252	308
EGYPT	0.391	0.178	0.066	0.216	1114
FINLAND	0.276	0.242	0.163	0.315	1727
FRANCE	0.182	0.212	0.126	0.315	9711
GERMANY	0.232	0.190	0.110	0.265	10642
HONGKONG	0.300	0.188	0.080	0.266	3758
INDIA	0.337	0.286	0.145	0.396	22689
INDONESIA	0.401	0.296	0.144	0.327	4515
ISRAEL	0.203	0.256	0.145	0.293	3084
ITALY	0.233	0.257	0.127	0.439	3245
JAPAN	0.292	0.231	0.105	0.328	61220
JORDAN	0.407	0.174	0.056	0.214	1038
MALAYSIA	0.349	0.207	0.082	0.285	14302
MEXICO	0.452	0.251	0.181	0.352	1677
NETHERLANDS	0.264	0.220	0.134	0.262	2563
NIGERIA	0.451	0.200	0.072	0.236	827
NORWAY	0.330	0.281	0.206	0.295	2674
PAKISTAN	0.465	0.298	0.121	0.420	2920
PERU	0.504	0.200	0.114	0.370	831
S KOREA	0.336	0.271	0.093	0.411	13752
SINGAPORE	0.291	0.197	0.085	0.269	8267
SOUTH AFRICA	0.315	0.157	0.088	0.205	4001
SPAIN	0.324	0.264	0.160	0.364	2201
SWEDEN	0.199	0.183	0.121	0.230	4089
SWITZERLAND	0.305	0.213	0.145	0.262	3503
THAILAND	0.390	0.255	0.102	0.295	7491
TURKEY	0.328	0.217	0.090	0.254	3056
UK	0.285	0.171	0.107	0.198	19962
ZIMBABWE	0.425	0.127	0.051	0.225	60

Table 3.2. Summary Statistics: Categorized by Creditors' Rights

This table presents the mean value of variables categorized by creditors' right. TotalLev is the sum of long-term debt (dltt) and short-term debt (dlc) scaled by total assets (AT). Long-term debt ratio (LTD) is long-term debt scaled by total assets. MktLev is (DLC+DLTT)/(DLC+DLTT+ MktEqu). Profitability is EBIT/AT.$TangibleAssets$ is property, plant and equipment scaled by total assets. Mkt to Book is the ratio of market value over book value. Creditors' rights data is collected from La Porta et al. (1997).

Creditors' Rights	TangibileAssets	TotalLev	MktLev	LTD	Mkt to Book	LTD/ Tangible Assets
0	0.245	0.215	0.322	0.132	1.400	2.400
1	0.322	0.238	0.325	0.126	1.604	2.374
2	0.314	0.246	0.332	0.119	1.390	1.567
3	0.313	0.201	0.270	0.095	1.487	4.120
4	0.293	0.175	0.209	0.102	1.738	2.734

Table 3.3. Summary Statistics: Categorized by Liquidation Index

This table presents the mean value of variables categorized by liquidation rights. Tangibility is the Property, Plant, and Equip/AT. TotalLev is the sum of long-term debt (dltt) and short-term debt (dlc) scaled by total assets (AT). The long-term debt ratio is long-term debt/AT. MktLev is (DLC+DLTT/(DLC+DLTT+ MktEqu). Creditors' rights data is collected from LLSV (1997).

	Liquidation Right	TangibileAssets	TotalLev	MktLev	LTD Ratio	LTD /Tangibility
Mean	0	0.263	0.228	0.326	0.139	0.528
Std. Dev		0.217	0.165	0.273	0.127	-
N		15577	15577	15577	15577	15542
Mean	1	0.300	0.211	0.284	0.108	0.360
Std. Dev		0.211	0.184	0.259	0.120	-
N		106817	106817	106817	106817	106391
Mean	2	0.322	0.232	0.309	0.110	0.341
Std. Dev		0.224	0.193	0.282	0.131	-
N		116298	116298	116298	116298	115909

Table 3.4. Summary Statistics: Categorized by Legal Origin

This table presents the mean value of variables categorized by legal origin. Total Lev is the sum of long-term debt (dltt) and short-term debt (dlc) scaled by total assets (AT). LTD is a long-term debt/AT. MktLev is DLC+DLTT/(DLC+DLTT+ MktEqu l). $TangibileAssets$ is the Property, Plant, and Equip scaled by total assets. Creditors' rights data is collected from LLSV (1997).

Legal Origin	Creditors' Rights	TangibileAssets	TotalLev	MktLev	LTD
English	2.912	0.328	0.209	0.269	0.106
French	1.218	0.305	0.237	0.315	0.131
German	2.177	0.292	0.232	0.330	0.106
Nordic	1.366	0.256	0.226	0.268	0.157

Table 3.5. Descriptive Statistics

This table presents the descriptive statistics of the major variables used in the study. Total Book Leverage is (Long-term debt+ Short Term Debt)/AT. LTD (STD)raio is long-term debt or short term debt/AT. Market Leverage is (DLC+DLTT)/(DLC+DLTT+MktEqu). Profitability is EBIT/AT. TangibileAssets is property, plant, and equipment/AT. MkttoBook is the ratio of market value over book value. RnD is R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide by the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' right is derived from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios.

Variable Name	Mean	Std. Dev	P1	P10	P25	P50	P75	P90	P99	N
Total Book Leverage (TotalLev)	0.222	0.188	0.000	0.000	0.051	0.196	0.348	0.488	0.738	239,730
Market Leverage (MktLev)	0.298	0.271	0.000	0.000	0.047	0.235	0.493	0.716	0.959	239,730
Long-term debt ratio (LTD)	0.111	0.126	0.000	0.000	0.003	0.068	0.178	0.297	0.497	239,730
Short term debt ratio	0.108	0.117	0.000	0.000	0.012	0.069	0.166	0.281	0.471	239,730
Tangibility/ Total Assets	0.308	0.219	0.002	0.039	0.131	0.279	0.447	0.621	0.888	239,730
Total Assets (USD)	1560.825	8100.416	2.518	16.650	50.096	173.328	634.296	2392.065	26840.537	239,730
Profitability	0.043	0.250	-0.560	-0.061	0.012	0.050	0.095	0.153	0.371	239,730
Mkt to Book	1.478	1.225	0.467	0.706	0.874	1.095	1.543	2.512	7.625	239,730
RnD	0.013	0.040	0.000	0.000	0.000	0.000	0.004	0.035	0.238	239,730
Altman Z	1.443	3.320	-6.611	0.010	0.877	1.557	2.214	2.917	5.691	239,730
Mean Industry Leverage	0.223	0.100	0.040	0.110	0.154	0.213	0.278	0.354	0.519	239,730
GDP per Capita/100000	0.265	0.178	0.005	0.016	0.086	0.280	0.385	0.468	0.725	239,730
Enforceability of contracts	348.476	298.184	60.000	60.000	75.000	360.000	425.000	600.000	1445.000	239,730
Rule of Law	1.029	0.742	-0.857	-0.063	0.456	1.312	1.626	1.773	1.966	239,730
Government Effectiveness	1.120	0.735	-0.766	-0.019	0.647	1.291	1.706	1.884	2.229	239,730
Creditors' Right	2.325	0.967	0.000	1.000	2.000	2.000	3.000	4.000	4.000	239,730
Stock Market Development	0.275	0.728	-1.170	-0.695	-0.187	0.260	0.839	1.184	1.881	239,730

Table 3.6. Base Regression

This table presents the regression results of firm leverage and tangibility with other control variables. *Size* is a natural log of total assets. TangibleAssets is Property, Plant, and Equip/AT. Profitability is EBIT/AT. MkttoBook is the ratio of market value over book value. RnD is R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide by the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' rights data is collected from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios. TotalLev is (DLC+DLTT)/AT. MktLev is (DLC+DLTT)/(DLC+DLTT+ MktEqu). LTD is Long-term Debt/AT. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

Dependent VARIABLE:	**LTD (1)**	**LTD (2)**	**LTD (3)**	**TotalLev (4)**	**MktLev (5)**
TangibleAssets	**0.1289*** **	**0.0805*** **	**0.0805*** **	**0.1145*** **	**0.1341*** **
	(90.5747)	**(35.7064)**	**(19.4366)**	**(20.0573)**	**(18.7459)**
	[36.68%]	**[22.91%]**	**[22.91%]**	**[16.29%]**	**[14.19%]**
Size	0.0156***	0.0267***	0.0267***	0.0401***	0.0618***
	(107.4910)	(56.4134)	(30.0884)	(28.4744)	(34.5240)
Profitability	0.0163***	-0.0047**	-0.0047	-0.0123	-0.0306**
	(6.9573)	(-2.3375)	(-1.4639)	(-1.5318)	(-2.5269)
Growth Opportunity	0.0003*	0.0005**	0.0005	-0.0014**	-0.0306***
	(1.7522)	(2.1618)	(1.3549)	(-2.4559)	(-37.6225)
RnD	-0.0713***	0.0009	0.0009	0.0174	-0.0675***
	(-11.1644)	(0.0984)	(0.0617)	(0.7794)	(-2.6517)
Altman Z	-0.0040***	-0.0022***	-0.0022***	-0.0043***	-0.0045***
	(-14.0053)	(-10.2816)	(-4.5273)	(-3.4029)	(-3.2788)
Mean Industry Leverage	0.4174***	0.2849***	0.2849***	0.5374***	0.5656***
	(134.0178)	(63.2126)	(35.5962)	(51.0726)	(39.7129)
GDP per Capita/100000	-0.0518***	-0.0436***	-0.0436***	-0.0700***	-0.1492***
	(-16.0312)	(-8.4332)	(-4.6843)	(-5.4086)	(-8.5661)
Enforceability of contracts	0.0000***	-0.0000***	-0.0000***	0.0000***	-0.0000***
	(44.4493)	(-12.5044)	(-7.5441)	(2.7350)	(-8.4712)
Rule of Law	0.0320***	0.0225***	0.0225***	0.0065	0.0212***
	(29.9166)	(12.5884)	(6.8051)	(1.4077)	(3.3853)
Government Effectiveness	-0.0075***	-0.0206***	-0.0206***	-0.0283***	-0.0122***
	(-8.6425)	(-17.5907)	(-8.9515)	(-8.8218)	(-2.7468)
Creditors' Right	-0.0044***	0.0037***	0.0037*	0.0018	-0.0089**
	(-16.7983)	(2.9239)	(1.8660)	(0.6328)	(-2.0785)
Stock Market Development	0.0088***	0.0034***	0.0034***	0.0004	-0.0159***
	(17.5633)	(7.5625)	(4.7929)	(0.3999)	(-11.6586)
Constant	-0.1271***	-0.1038***	-0.1038***	-0.0883***	-0.0994***
	(-34.5301)	(-22.1401)	(-13.2444)	(-7.9642)	(-6.4438)
Observations	238,653	238,933	238,933	238,933	238,514
Adjusted R-squared	0.2851	0.6607	0.6607	0.7394	0.7248
Firm FE	NO	YES	YES	YES	YES
Ind FE	YES	NO	NO	NO	NO
Year FE	YES	YES	YES	YES	YES
Clustering	NO	NO	Firm-Level	Firm-Level	Firm-Level

Table 3.7. Creditors' Right

This table presents the regression results of firm leverage, tangibility, and creditors' right with other control variables. Strong Creditors' Right is a dummy variable when the creditors' right index is 3 or 4, 0 otherwise. Size is the natural log of total asset. TangibleAssets is Property, Plant, and Equip/AT. Profitability is EBIT/AT. MkttoBook is the ratio of market value over book value. RnD is R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide by the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' rights are derived from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios. TotalLev is DLC+DLTT/AT. MktLev is DLC+DLTT/(DLC+DLTT+ MktEqu). LTD is long-term Debt/AT. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

	LTD	**TotalLev**	**MktLev**
	(1)	(2)	(3)
Stronger Creditors' Rights	-0.020***	0.040***	0.121***
	(-2.869)	(3.816)	(14.589)
TangibleAssets	0.110***	0.142***	0.182***
	(16.044)	(15.396)	(28.758)
TangibleAsset * Strong Creditors' Rights	**-0.050*** **	**-0.046*** **	**-0.079*** **
	(-6.060)	**(-4.146)**	**(-9.952)**
Size	0.027***	0.040***	0.061***
	(30.292)	(28.333)	(65.939)
Profitability	-0.005	-0.013	-0.031***
	(-1.537)	(-1.570)	(-5.598)
MkttoBook	0.000	-0.001**	-0.031***
	(1.001)	(-2.451)	(-65.790)
RnD	0.002	0.014	-0.078***
	(0.160)	(0.617)	(-5.043)
Altman Z	-0.002***	-0.004***	-0.004***
	(-4.580)	(-3.347)	(-8.714)
Mean Industry Leverage	0.288***	0.534***	0.556***
	(35.936)	(50.692)	(67.458)
GDP per Capita/100000	-0.038***	-0.072***	-0.159***
	(-4.127)	(-5.587)	(-16.179)
Enforceability of contracts	-0.000***	0.000***	-0.000***
	(-6.780)	(2.640)	(-15.136)
Rule of Law	0.026***	0.003	0.010***
	(7.686)	(0.682)	(2.768)
Government Effectiveness	-0.021***	-0.028***	-0.012***
	(-8.938)	(-8.732)	(-5.041)
Creditors' Right	0.013***	-0.003	-0.028***
	(6.838)	(-1.050)	(-10.214)
Stock Market Development	0.003***	0.001	-0.015***
	(4.793)	(0.598)	(-17.794)
Constant	-0.124***	-0.092***	-0.094***
	(-15.991)	(-8.792)	(-10.453)
Observations	238,933	238,933	238,514
Adjusted R-squared	0.661	0.740	0.725
Firm FE	YES	NO	YES
Year FE	YES	YES	YES
Clustering	YES	YES	YES

Table 3.8. Financial Development

This table presents the regression results of firm leverage, tangibility, and financial development with other control variables. Strong FinDev is a dummy variable when the financial market development is above the median value, 0 otherwise. Size is the natural log of total assets. TangibleAssets is Property, Plant, and Equip/AT. Profitability is EBIT/AT. MkttoBook is the ratio of market value over book value. RnD is R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide by the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' rights are derived from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios. TotalLev is DLC+DLTT/AT. MktLev is DLC+DLTT/(DLC+DLTT+ MktEqu). LTD is Long-term Debt/AT. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	**LTD** **(1)**	**TotalLev** **(2)**	**MktLev** **(3)**
$TangibleAssets$	0.080***	0.112***	0.143***
	(16.998)	(17.510)	(17.777)
$Strong\ FinDev$	-0.003***	0.002	0.001
	(-2.842)	(1.266)	(0.239)
$\boldsymbol{TangibleAsset * Strong\ FinDev}$	**0.004**	**0.007**	**-0.016*** **
	(1.382)	**(1.653)**	**(-2.775)**
$Size$	0.027***	0.040***	0.061***
	(29.497)	(28.191)	(33.515)
Profitability	-0.004	-0.011	-0.028**
	(-1.224)	(-1.254)	(-2.213)
$MkttoBook$	0.000	-0.001**	-0.031***
	(1.200)	(-2.404)	(-37.040)
RnD	0.011	0.022	-0.062**
	(0.736)	(0.942)	(-2.318)
$Altman\ Z$	-0.002***	-0.005***	-0.005***
	(-4.765)	(-3.614)	(-3.555)
$Mean\ Industry\ Leverage$	0.283***	0.533***	0.571***
	(34.753)	(50.021)	(39.425)
$GDP\ per\ Capita/100000$	-0.040***	-0.074***	-0.100***
	(-4.281)	(-6.042)	(-6.023)
Enforceability of contracts	-0.000***	0.000**	-0.000***
	(-7.768)	(2.408)	(-7.898)
$Rule\ of\ Law$	0.024***	0.006	0.020***
	(6.882)	(1.197)	(3.099)
$Government\ Effectiveness$	-0.024***	-0.027***	-0.026***
	(-10.018)	(-8.678)	(-5.961)
$Creditors'\ Right$	0.003	0.003	-0.014***
	(1.334)	(0.974)	(-3.186)
Constant	-0.098***	-0.090***	-0.076***
	(-12.138)	(-8.080)	(-4.897)
Observations	228,994	228,994	228,582
Adjusted R-squared	0.663	0.742	0.727
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Clustering	Firm-Level	Firm-Level	Firm-Level

Table 3.9. Governance

This table presents the regression results of firm leverage, tangibility, and country-level governance with other control variables. High Governance is a dummy variable when the country-level governance is above the median value, 0 otherwise. Size is the natural log of total assets. TangibleAssets is Property, Plant, and Equip/AT. Profitability is EBIT/AT. MkttoBook is the ratio of market value over book value. RnD is R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide by the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' right is derived from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios. TotalLev is DLC+DLTT/AT. MktLev is DLC+DLTT/(DLC+DLTT+ MktEqu). LTD raio is Long-term Debt/AT. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	**LTD** **(1)**	**TotalLev** **(2)**	**MktLev** **(3)**
TangibleAssets	0.088***	0.127***	0.139***
	(18.110)	(18.294)	(15.353)
StrongGovernance	0.011***	0.001	-0.001
	(6.147)	(0.293)	(-0.226)
TangibleAsset * StrongGovernance	**-0.016*** **	**-0.025*** **	**-0.010**
	(-3.200)	**(-3.604)**	**(-1.065)**
Size	0.027***	0.040***	0.062***
	(30.181)	(28.540)	(34.569)
Profitability	-0.005	-0.012	-0.031**
	(-1.474)	(-1.548)	(-2.533)
MkttoBook	0.001	-0.001**	-0.031***
	(1.373)	(-2.539)	(-37.647)
RnD	0.001	0.015	-0.069***
	(0.060)	(0.673)	(-2.697)
Altman Z	-0.002***	-0.004***	-0.004***
	(-4.497)	(-3.406)	(-3.280)
Mean Industry Leverage	0.285***	0.537***	0.565***
	(35.628)	(51.020)	(39.702)
GDP per Capita/100000	-0.047***	-0.070***	-0.149***
	(-5.062)	(-5.403)	(-8.546)
Enforceability of contracts	-0.000***	0.000***	-0.000***
	(-7.358)	(2.613)	(-8.537)
Rule of Law	0.021***	0.008*	0.022***
	(6.197)	(1.679)	(3.476)
Government Effectiveness	-0.024***	-0.024***	-0.010**
	(-10.052)	(-7.479)	(-2.223)
Creditors' Right	0.003	0.002	-0.009**
	(1.548)	(0.894)	(-1.993)
Stock Market Development	0.003***	0.000	-0.016***
	(4.655)	(0.458)	(-11.676)
Constant	-0.103***	-0.095***	-0.103***
	(-13.060)	(-8.607)	(-6.626)
Observations	238,933	238,933	238,514
Adjusted R-squared	0.661	0.740	0.725
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Clustering	Firm-Level	Firm-Level	Firm-Level

Table 3.10. Country Transparency

This table presents the regression results of firm leverage, tangibility, and the country's transparency measure. MoreTranspCountry is a dummy variable of 1 when the CPI score of a country is above the median value, 0 otherwise. Size is the natural log of total assets. TangibleAssets is Property, Plant, and Equip/AT. Profitability is EBIT/AT. MkttoBook is the ratio of market value over book value. RnD is R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' rights are derived from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios. TotalLev is DLC+DLTT/AT. MktLev is DLC+DLTT/(DLC+DLTT+ MktEqu). LTD is Long-term Debt/AT. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	**LTD** **(1)**	**TotalLev** **(2)**	**MktLev** **(3)**
$TangibleAssets$	0.106***	0.134***	0.168***
	(15.455)	(14.328)	(13.060)
$MoreTranspCountry$	0.014***	0.008**	-0.002
	(5.519)	(2.310)	(-0.319)
$\boldsymbol{TangibleAsset * MoreTranspCountry}$	**-0.029*** **	**-0.023*** **	**-0.051*** **
	(-4.771)	**(-2.751)**	**(-4.326)**
$Size$	0.026***	0.041***	0.065***
	(28.920)	(27.923)	(35.376)
Profitability	-0.004	-0.013	-0.031**
	(-1.292)	(-1.533)	(-2.436)
$MkttoBook$	0.000	-0.001**	-0.030***
	(1.090)	(-2.462)	(-36.410)
RnD	0.009	0.020	-0.059**
	(0.621)	(0.898)	(-2.310)
$Altman\ Z$	-0.002***	-0.005***	-0.005***
	(-4.699)	(-3.709)	(-3.457)
$Mean\ Industry\ Leverage$	0.272***	0.524***	0.555***
	(32.685)	(47.240)	(37.136)
$GDP\ per\ Capita/100000$	-0.033***	-0.076***	-0.175***
	(-3.394)	(-5.749)	(-9.852)
Enforceability of contracts	-0.000***	0.000**	-0.000***
	(-7.026)	(2.360)	(-4.324)
$Rule\ of\ Law$	0.026***	0.011**	0.043***
	(7.070)	(2.134)	(5.951)
$Government\ Effectiveness$	-0.016***	-0.027***	-0.027***
	(-6.468)	(-7.567)	(-5.230)
$Creditors'\ Right$	0.002	-0.000	-0.019***
	(1.157)	(-0.141)	(-4.651)
Constant	0.002**	-0.001	-0.015***
	(2.439)	(-1.126)	(-10.531)
	-0.118***	-0.091***	-0.150***
Observations	(-13.760)	(-7.363)	(-8.800)
Adjusted R-squared			
Firm FE	214,914	214,914	214,527
Year FE	0.665	0.742	0.730
Clustering	YES	YES	YES

Table 3.11. Endogeneity Test: 2SLS

This table presents the second stage regression results of firm leverage and tangibility taking the instrumental variable approach. The leverage ratio is the dependent variable. *Size* is a natural log of total assets. TangibleAssets is Property, Plant, and Equip/AT. Profitability is EBIT/AT. MkttoBook is the ratio of market value over book value. RnD is R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' right is derived from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios. TotalLev is DLC+DLTT/AT. MktLev is DLC+DLTT/(DLC+DLTT+ MktEqu). LTD is Long-term Debt/AT. I take three instruments: number of competitors in the 3 digit SIC industry (NoPotBuy), financial slack of the competitors in the SIC 3 digit industry (MNLPotBuy). Natural log of M&A transaction in the 3digit SIC industry in the last year ($Ln(M\&A)_{Industry}$). Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	First Stage	**LTD** (1)	**TotalLev** (2)	**MktLev** (3)	**LTD** (4)	**TotalLev** (5)	**MktLev** (6)	**LTD** (7)	**TotalLev** (8)	**MktLev** (9)	**LTD** (10)	**TotalLev** (11)	**MktLev** (12)
TangibleAssets		0.175***	0.167***	0.236***	0.159***	0.143***	0.191***	0.068***	0.019**	-0.023**	0.269***	0.202***	0.198***
		(28.652)	(18.284)	(19.369)	(25.833)	(16.017)	(16.304)	(11.360)	(2.245)	(-2.000)	(22.023)	(11.941)	(8.667)
Strong Creditor'sRight		-0.026**	0.023	0.089***									
		(-2.109)	(1.213)	(3.548)									
TangibleAssets ∗ Strong CredRight		**-0.048*** **	**-0.073*** **	**-0.090*** **									
		(-8.130)	**(-8.702)**	**(-8.128)**									
Strong Fin Dev					0.006***	-0.003	-0.013***						
					(3.810)	(-1.063)	(-4.239)						
TangibleAssets ∗ Strong Fin Dev					**-0.013*** **	**-0.012* **	**0.015**						
					(-2.644)	**(-1.699)**	**(1.640)**						
Strong Governance								0.009***	0.000	-0.006			
								(5.101)	(0.029)	(-1.498)			
TangibleAssets ∗ Strong Governance								**-0.010* **	**-0.026*** **	**-0.004**			
								(-1.918)	**(-3.512)**	**(-0.359)**			
More Transparency											0.053***	0.021***	-0.055***
											(10.659)	(3.052)	(-5.813)
TangibleAssets ∗ More Transparen											**-0.129*** **	**-0.074*** **	**0.003**
											(-11.040)	**(-4.662)**	**(0.147)**
TOT M&A	0.00006												
	(0.07)												
MNLPOTBUY	0.0002***												
	(3.331)												
MeanIndTang	0.890***												
	(122.41)												
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	111,742	111,742	111,742	111,569	111,742	111,742	111,569	128,723	128,723	128,508	103,331	103,331	103,166
Adjusted R-squared	0.480	0.231	0.225	0.304	0.231	0.224	0.304	0.240	0.228	0.300	0.231	0.223	0.305
Ind. FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Hansen J Test	**1.632**												
	(0.442)												

Table 3.12. Robustness Test: Crisis Period

This table presents the association between tangible assets and leverage during the housing crisis periods in the heterogeneous institutional environment. The crisis period is a dummy variable 1 when the data point is either in 2007,2008,2009 or 2010. The leverage ratio is the dependent variable. *Size* is a natural log of total assets. TangibleAssets is Property, Plant, and Equip/AT. Profitability is EBIT/AT. MkttoBook is the ratio of market value over book value. RnDis R&D scale by sales. Altman Z is equal to 1.2*working capital + 1.4*retained earnings + 3.3*EBIT+0.6*Mkt value of equity + 1.0*Sales. Mean Ind. Leverage is the average total leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perception of the extent that agents abide the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditors' rights are derived from La Porta et al. (1997). Stock Market Development is the averaging standardized market capitalization values to GDP, total value traded to GDP, and total value traded to market capitalization ratios. TotalLev is (DLC+DLTT)/AT. MktLev is (DLC+DLTT)/(DLC+DLTT+MktEqu). LTD is Long-term Debt/AT. Standard errors are adjusted for heteroscedasticity (Huber-White estimators) or clustered at firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	**LTD** (1)	**TotalLev** (2)	**MktLev** (3)	**LTD** (4)	**TotalLev** (5)	**MktLev** (6)	**LTD** (7)	**TotalLev** (8)	**MktLev** (9)	**LTD** (10)	**TotalLev** (11)	**MktLev** (12)
TangibleAssets	0.107***	0.141***	0.180***	0.078***	0.110***	0.141***	0.103***	0.130***	0.161***	0.086***	0.126***	0.138***
	(29.260)	(30.068)	(28.002)	(29.431)	(31.534)	(30.082)	(22.293)	(21.799)	(18.822)	(30.902)	(33.844)	(26.838)
CrisisDummy	-0.017***	-0.017***	0.047***	-0.008***	-0.013***	0.039***	-0.010***	-0.027***	0.074***	-0.007***	-0.017***	0.026***
	(-7.061)	(-5.525)	(10.405)	(-3.097)	(-4.190)	(8.339)	(-3.038)	(-6.252)	(11.665)	(-2.852)	(-5.603)	(5.609)
CrisisDummyX TangibleAssets	**0.012*** **	**0.003**	**0.011** **	**0.003**	**0.008** **	**0.016*** **	**0.015*** **	**0.017** **	**0.033*** **	**0.010*** **	**0.007***	**0.015*** **
	(4.548)	**(1.051)**	**(2.208)**	**(1.070)**	**(2.225)**	**(3.140)**	**(2.590)**	**(2.324)**	**(3.081)**	**(3.478)**	**(1.845)**	**(2.759)**
HighCreditorsRights	-0.009**	0.037***	0.090***									
	(-2.006)	(6.601)	(11.528)									
HighCreditorsRights X $Tangibility_{Titman}$	-0.045***	-0.045***	-0.074***									
	(-9.716)	(-7.419)	(-9.142)									
CrisisDummyXHighCreditorsRights	0.008***	0.006***	0.015***									
	(5.810)	(2.970)	(5.430)									
CrisisDummyXHighCreditorsRights X TangibleAssets	**-0.020*** **	**-0.005**	**-0.029*** **									
	(-4.694)	**(-0.900)**	**(-3.887)**									
Strong FinDev				-0.002**	0.002**	0.002						
				(-2.511)	(2.081)	(1.024)						
Strong FinDev X $Tangibility_{Titman}$				0.006**	0.009***	-0.009**						
				(2.418)	(3.136)	(-2.280)						
CrisisDummy X *Strong FinDev*				0.002*	-0.001	-0.005**						
				(1.756)	(-0.801)	(-2.047)						
CrisisDummy X *Strong FinDev* X *TangibleAssets*				**0.001**	**-0.013** **	**-0.038*** **						
				(0.251)	**(-2.555)**	**(-5.245)**						
StrongGovernance							0.011***	-0.000	-0.006***			
							(9.467)	(-0.187)	(-2.700)			
StrongGovernance X $Tangibility_{Titman}$							-0.013***	-0.022***	-0.003			
							(-4.205)	(-5.626)	(-0.464)			
CrisisDummy X *StrongGovernance*							0.002	0.004**	0.015***			
							(1.288)	(2.118)	(5.499)			
CrisisDummy X *StrongGovernance* X *TangibleAssets*							**-0.016*** **	**-0.011** **	**-0.025*** **			
							(-3.841)	**(-2.189)**	**(-3.467)**			
MoreTranspCountry										0.014***	0.006**	-0.005
										(7.020)	(2.344)	(-1.269)
MoreTranspCountry X $Tangibility_{Titman}$										-0.027***	-0.019***	-0.043***
										(-5.939)	(-3.293)	(-5.079)

CrisisDummy X *MoreTranspCountry*										0.003	0.011***	0.024***
										(1.080)	(3.406)	(4.746)
CrisisDummy* X *MoreTranspCountry* X *TangibleAssets										**-0.015****	**-0.017****	**-0.033*****
										(-2.299)	**(-2.239)**	**(-2.857)**
Controls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Observations	238,933	238,933	238,514	228,994	228,994	228,582	214,914	214,914	214,527	238,933	238,933	238,514
Adjusted R-squared	0.661	0.740	0.725	0.663	0.742	0.727	0.665	0.742	0.730	0.661	0.740	0.724
Ind FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

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APPENDICES

A.1. Dynamic Panel Model

Table B.1 columns 1 and 2 report the results using equation (2). I find that lag book leverage is positively and significantly associated with book leverage with the coefficient of 0.813, meaning that firms' previous years leverage associates current year's leverage by 81.30%. The coefficient of lag market leverage is 0.73 and significant at the 1% level. In Blundell Bond system GMM, the coefficients of lag dependent variables are the measure of (1-λ) where λ represents for SOA.

A.2. Financial flexibility, low tangible assets, and investment

For the sake of robustness, I perform a separate test of whether financial flexibility and low tangible assets are associated negatively with the investment. I find that the interaction effect is negative and statistically significant at 1% level.

Appendix A.1. Dynamic Modeling

This table presents the dynamic regression model using the lag dependent variable as one of the regressors. I use the system GMM method to estimate the dynamic capital structure. The independent variables are as follows. Tangible assets scaled by the total assets is the variable of interest. *ROA* is EBIT/AT. Market to book is the market value scaled by book value. RnD/Sales is the R&D scaled by sales. RnD_Dummy is 1 if R&D expenditure is positive, 0 otherwise. Mean Ind. Leverage is the average book leverage of 2 digit SIC industry. The enforceability of contracts is the number of days to resolve a payment dispute through courts. Rule of Law is the perceptions of the extent that agents abide by the rules of society. Governance effectiveness captures the perceptions of the quality of public services. Creditor rights are the rights of the creditors. Stock Market Development is the averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios. BookLev is long term debt plus short-term debt scaled by total assets. MktLev is long term debt plus short-term debt scaled by long term debt plus short term debt plus market value. Standard errors are heteroscedasticity adjusted robust (Huber-White estimators). ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) $BookLev_{i,t+1}$	(2) $MktLev_{i,t+1}$
	System GMM (Blundell and Bond, 1998)	
BookLev	0.813***	
	(37.847)	
MktLev		0.730***
		(31.298)
Tangible Assets	0.018**	0.023*
	(1.987)	(1.677)
Size	0.003	0.002
	(1.630)	(0.497)
ROA	-0.009	-0.007
	(-0.957)	(-0.429)
MkttoBook	0.002	-0.006**
	(0.905)	(-2.498)
RnD/Sales	-0.089*	-0.308***
	(-1.802)	(-4.934)
RnD_Dummy	0.001	0.010
	(0.215)	(1.383)
Altman Z	0.001	0.001
	(0.782)	(1.220)
Mean Industry Leverage	-0.074	-0.192**
	(-0.707)	(-2.209)
GDP per Capita/100000	0.113	0.075
	(1.483)	(0.687)
Enforceability of contracts	0.000***	0.000***
	(2.995)	(3.077)
Rule of Law	-0.022	0.054
	(-0.922)	(1.505)
Government Effectiveness	0.010	-0.077**
	(0.497)	(-2.443)
Creditors' Right	0.040***	0.076***
	(2.867)	(3.351)
Stock Market Development	0.009	-0.009
	(1.578)	(-1.188)
Constant	-0.155***	-0.025
	(-2.579)	(-0.334)
Number of Obs.	149,859	149,475
Year FE	YES	YES
Wald Test (p-value)	0.000	0.000
AR 2 (p-value)	0.78	0.08

Appendix A.2. Financial flexibility, Low Tangible Assets, and Investment

This table presents the panel regression for the Q-model of investment as specified in Eq. (4). The dependent variable is $TotInv$. $TotInv$ is the sum of CAPEX, R&D expense, and sells and general expenditure scaled by total assets. CF is the cash flow scaled by total assets. FF2 is the firm's financial flexibility if a firm is under-levered for the previous two consecutive years. $LowTangibile_{Assets}$ is the dummy variable 1 if the asset tangibility is lower than the industry median value. $TobinQ$ is the market value plus total debt minus current debt scaled by gross PPENT following Andrei et al. (2019). Column 4 reports the 2nd stage of instrumental variable approach taking the following instruments: number of potential buyers ($NoPotBuy$), financial slack ($MNLPotBuy$), total M & A activity of the firms' industry ($TotM\&A$), and SIC 2 digit mean industry leverage. T-values are reported in parenthesis. Standard errors are robust standard errors or clustered at the firm level. ***, **, and * indicate that the coefficients are statistically significant at 1%, 5%, and 10% levels, respectively.

	(1) Pooled	(2) FE	(3) FE
$TotInv_{i,t-1}$	0.662***	0.268	0.653***
	(3.041)	(1.423)	(2.891)
$FF2$	0.021***	0.021***	0.022***
	(2.781)	(4.175)	(2.619)
$CF_{i,t-1}$	0.131***	0.050	0.120***
	(7.613)	(0.993)	(3.842)
$FF2{*}CF_{i,t-1}$	-0.097***	-0.046*	-0.100***
	(-3.406)	(-1.647)	(-2.840)
$LowTangibles_{i,t-1}$	0.007*	0.001	-0.002
	(1.682)	(0.088)	(-0.183)
$\boldsymbol{LowTangibles_{i,t-1}{*}FF2}$	**-0.010*** **	**-0.020*** **	**-0.012*** **
	(-3.430)	**(-3.384)**	**(-2.836)**
$TobinQ$	0.001*	0.000	0.001*
	(1.929)	(1.088)	(1.648)
Constant	0.076	0.094***	0.051
	(1.408)	(2.965)	(1.220)
Observations	90,975	90,975	90,910
R-squared	0.592	0.835	0.598
Year FE	NO	YES	YES
Ind. FE	NO	NO	YES
Firm FE	NO	YES	NO

Appendix B.1. Variables Description

Variable	Descriptions	Source
	Firm-level variables	
Altman Z score	3.3*EBIT/AT)+1.0*(Sales/AT)+1.4*(RE/AT)+1.2*(WC/AT), where AT= total assets	COMPUSTAT global
Book leverage (BookLev)	Long-term debt (DLTT) plus debt in current liabilities (DLC) to total assets net of cash (che)	COMPUSTAT global
CAPX	The ratio of capital expenditures (CAPX) to total assets.	COMPUSTAT global
Debt issue	Following Frank and Goyal (2003), $(\text{Book Debt}_t - \text{Book Debt}_{t-1}/\text{Total Assets} > 5\%$	COMPUSTAT global
CF	Income before extra-ordinary items +Depreciation and Amortizations+ Extra ordinary items and discontinued operations+ deferred tax+ equity in net loss-earnings+ other funds from operations+ gain (loss) from sale of PPE	COMPUSTAT global
Debt Issue	Following Hovakimian, Opler, and Titman (2001), the net debt issue is tracked from the change of short-term debt or long-term debt reported in the COMPUSTAT Global.	COMPUSTAT Global
Declining Profitability	Declining profitability if the firm's EBIT declines from the previous year for the previous three consecutive years	COMPUSTAT global
Deficit Financing	(Dividend + Investment + △WC-CF)/Total Assets	COMPUSTAT global
$DEV^{*}_{i,t+1}$	$\text{TargetLev}_{i,t+1} - \text{ActualLev}_{i,t}$. Where $\text{TargetLev}_{i,t+1}$ is the predicted value from eq (2).	COMPUSTAT global
Equity Issue	Following Hovakimian, Opler, and Titman (2001), Sale of common stock minus purchase of common stock scaled by total assets >5%.	COMPUSTAT global
Excess Leverage	Following Chen et al. 2019, I calculate excess leverage as the error of the regressions using equation (1).	COMPUSTAT Global
External Financing	External financing is a fraction of net external funding over total financing (sum of cash flows from operations and net external financing)	COMPUSTAT Global
FF2	If firms are under levered for the previous two consecutive years, then FF2 is 1, and 0 otherwise.	COMPUSTAT global
FinMkt	Measures total financial market development and is computed by averaging standardized values of Stock Market and Bond Market Development	WDI
Financial Slack	Cash (che)/ Lag Total Assets	COMPUSTAT Global
HighTangible	A dummy variable is equal to 1 if tangible assets is higher than the industry median value, 0 otherwise	COMPUSTAT global
$\widehat{\text{High}}_{\text{tangible}}$	A dummy variable is equal to 1 if predicted tangible assets is higher than the industry median value, 0 otherwise.	COMPUSTAT global
$\text{Large}\Delta_5\text{Trust}$ (β_1)	$\text{Large}\Delta_5\text{Trust}$ is a dummy variable 1 when the five years change of trust is in the top tercile, 0 otherwise	World Value Survey (WVS)
$\text{Ln(M\&A)}_{\text{Industry}}$	The natural log of the merger and acquisition value in the 3 digit SIC industry	SDC Platinum
LTD	Long term debt ratio. DLTT/AT	COMPUSTAT Global
Market Leverage (MktLev)	Following Chen, Harford, and Kamara (2019), MktLev=(long term debt+short term debt)/(long term debt +short term debt+market value)	COMPUSTAT global
Mean Industry Lev	Average book leverage of 2 digit SIC industry	COMPUSTAT global
Mean Industry Tangible	Mean tangible assets of Fama French 49 industries	COMPUSTAT global
Market to Book (Growth opportunity)	The market value of assets to book value of total assets (AT). The market value of assets is equal to the market value of common equity (fiscal year-end price (PRCC_F) times shares outstanding (CSHO), plus total assets (AT) minus book value of common equity (CEQ). The market value of equity for firms is calculated using the December closing price (PRCCD) multiplied by the total number of common shares outstanding for the issue (CSHOC). If the current figure for common shares outstanding as of the company's fiscal year-end is missing, the previous year's value is used.	COMPUSTAT global
MNLPOT	Minus average book leverage of the rivals in the industry (3 digits SIC code industry) averaged over the previous three years	COMPUSTAT global
Over Leverage	A dummy variable is equal to 1 if $\widehat{\text{Lev}_{i,t}} - \text{Lev}_{i,t} < 0$, 0 otherwise	COMPUSTAT global
Profitability (ROA)	EBIT scaled by total assets	COMPUSTAT global
R&D	R&D expenditure scaled by total assets	COMPUSTAT global
R&D expenditures	R&D expenditure (XRD) to sales (SALE). If R&D expenditure is missing, I follow the tradition to set the missing value to zero, over year t.	COMPUSTAT global
ROA	EBIT/AT	COMPUSTAT Global
Size	Ln(Total Assets)	COMPUSTAT global
Size_sqr	Size square	COMPUSTAT Global
Short-term debt ratio	Leverage due within 1 year	COMPUSTAT global
$\text{Small}\Delta_5\text{Trust}$ (β_2)	$\text{Small}\Delta_5\text{Trust}$ is a dummy variable 1 when the five years change of trust is in the bottom tercile, 0 otherwise	World Value Survey (WVS)

Tangibile Assets	PPENT/AT	COMPUSTAT global
Target D/A	Target leverage ratio predicted after equation (2)	COMPUSTAT global
Tobin Q	Market value / gross property, plant, and equipment, following Andrei et al. (2019).	COMPUSTAT global
TotInv	CAPEX, plus R&D, plus Sells and general expenditures scaled by total assets	COMPUSTAT global
TotM&A	Total M&A transactions occuring in firm's industry in a given year	SDC platinum
Under Leverage	A dummy variable is equal to 1 of $\widehat{Lev_{i,t}} - Lev_{i,t} > 0$, 0 otherwise	COMPUSTAT global
Working capital	the ratio of current assets less current liabilities less cash and marketable securities scaled by total assets	COMPUSTAT global
$\Delta BookLev_{i,t+1}$	Change of book leverage at t+1	COMPUSTAT global
$\Delta MktLev_{i,t+1}$	Change of market leverage at t+1	COMPUSTAT global
	Country-level Variables	
Aggregate governance	Sum of percentile rank of all the six indicators: Voice and Accountability, Political Stability, Governance Effectiveness, Regulatory Quality, Rule of Law, and Control of corruption.	World Governance Indicators (WGI)
Bond Market Development	Measures financial intermediary development and equals the average of standardized values of liquid liabilities to GDP and domestic credit for private firms to GDP ratios.	World Development Indicator (WDI)
Corruption Perception Index	The index of public sector corruption according to experts and businesspeople, uses a rank of 0 to 100, where 0 is highly corrupt and 100 is very clean	Transparency International databases
Creditor rights	The sum of four 0-1 indicator variables that evaluate whether there is no automatic stay on assets (NO_AUTOSTAY), whether secured creditor paid first (SECURED_FIRST), whether there are restrictions on going into reorganization (RESTRICT_REORG), and whether management stays in the reorganization (MGMT_NOT_STAY) (measured at the country-level)	La Porta et al.1997) and Djankov, McLeish, and Shleifer (2007)
CrisisDummy	Dummy variable 1 if the data point is in the year 2007 to 2010, 0 otherwise	
DEBTMKT	Measures financial intermediary development and equals the average of standardized values of liquid liabilities to GDP and domestic credit for private firms to GDP ratios. (Source: Brockman and Unlu, 2009)	World Development Indicators (WDI)
Degree of Hierarchy (DOH)	If people believe they should follow the instructions of superiors of doing a particular job.	WVS
Degree of Individualism (DOI)	If people believe they need larger income differences as incentives for individual efforts.	WVS
Domestic Credit to Private Firm/GDP	Domestic Credit to Private Firm scaled GDP	WDI
Enforcement of law	The number of days to resolve a payment dispute through courts	World Development Indicators (WDI) database.
Financial Market Development	It is computed by averaging standardized values of STKMKT and DEBTMKT.	World Development Indicators (WDI)
GDP per Capita/100000	GDP per capita scaled by 100000	WDI
Governance Effectiveness	Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	World Governance Indicators (WGI)
HHI	Sum of (sale/SIC 2 digits industry sale)^2	COMPUSTAT Global
$High_{Trust}$	$High_{Trust}$is a dummy variable 1 if the social trust is in top quartile and 0 when trust is in the bottom quartile.	World Value Survey (WVS).
Individualism	The degree to which people in a society are integrated into a group	Hofstede Insights
Inflation	GDP deflator	WDI
Log GDP per capita	Natural log of GDP per capita	(WDI) database.
Long Term Orientation	As Hofstede notes: "Long Term Orientation stands for the fostering of virtues oriented towards future rewards, in particular perseverance and thrift	Hofstede Insights
Low Creditors' Right	A dummy variable if creditors' rights are 0,1 or 2, and 0 otherwise.	La Porta et al. (1998)
Masculinity	Represents a preference in society for achievement, heroism, assertiveness, and material rewards for success	Hofstede Insights

MGMT_NOT_STAY	Captures the ability of creditors or courts to replace the incumbent management during bankruptcy	LLSV (1997)
MoreTranspCountry	A dummy variable of 1 if countries transparency value is higher than median value, 0 otherwise	Transparency International
NO_AUTOSTAY	Equals one if the bankruptcy code prohibits an automatic stay on assets	La Porta et al.1997)
Rainfall Variation	The covariance of rainfall for each country	Davis (2016)
RESTRICT_REORG	Equals one if the bankruptcy code prevents management from unilaterally filing a reorganization plan	La Porta et al. (1997)
Rule of law	The rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	World Governance Indicators (WGI)
R&D Expenditure_Country	Research and Development % of GDP	WDI
SECURED_FIRST	Equals one if secured creditors' claims are given absolute priority relative to the government or employee claims	La Porta et al. (1997)
STKMKT	Measures stock market development and is computed by averaging standardized values of market capitalization to GDP, total value traded to GDP, and total value traded to market capitalization ratios.	World Development Indicators (WDI)
Strong Creditor rights	A dummy variable is equal to 1 if the creditor rights index is 3 or 4, 0 otherwise	La Porta et al. (1997)
StrongCreditors'Rights	A dummy variable of 1 if Creditors' rights are 3 or 4, 0 otherwise.	La Porta et al. (1997)
Strong FinDev	A dummy variable of 1 if financial development is above the median, 0 otherwise	WDI
Trust	The ratio of the sum of positive response to total response of the following question ''Generally speaking, would you say that most people can be trusted or you need to be very careful in dealing with people?"	World Value Survey (WVS)
Trust_{US}	Most people are trusted	Putnam (1993)
Uncertainty Avoidance	A society's tolerance for ambiguity	Hofstede Insights
Weak Creditor rights	A dummy variable is equal to 1 if the creditor rights index is 0,1, or 2, 0 otherwise	La Porta et al. (1997)
WeakFinlDev	A dummy variable if the country's FinMkt, financial development index, is below (above) the median	WDI
WeakGovernance	A dummy variable 1 if the Aggregate governance is below the median value, 0 otherwise.	WGI

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