# Corporate Debt Structure Around the World*

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**Abstract**

Combining different datasets for the first time, we reconstruct the debt structure of 10,136 firms operating across 52 countries from 2002 to 2021, which comprise 124,101 corporate bond issues held by 63,323 bondholders and 85,817 bank loans and credit lines extended by 10,154 banks. Contrary to prior literature, total debt ownership is most concentrated in civil law countries, and most dispersed in common law countries. This result is driven by dispersion of junior arm's length debt. There is considerable heterogeneity: In countries with stronger investor protection the debt structure features dispersed debt ownership, with dispersed arm's length borrowing coexisting with concentrated bank borrowing. In countries with weaker investor protection, firms mitigate the unfavorable institutional environment by borrowing at shorter maturity, and by borrowing in USD-denominated (foreign) debt. These patterns are strongest for small-to-medium size firms, whereas the largest firms have dispersed debt ownership by international investors almost irrespective of their country of incorporation. The considerable heterogeneity that we uncover along debt types and firm size thus supports the importance of considering at the same time different sources of debt, including bank loans, credit lines, and arm's length debt, to obtain a full picture of firms' debt structures around the world. Our results broadly support legal origin and financial contracting theories of corporate debt structure.

**Keywords:** Debt Structure, Debt Ownership Concentration, Law and Finance, Investor Protection, Creditor Rights
**JEL Classification:** : G30, G32, K00, N20

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# 1 Introduction

Understanding the determinants and consequences of different sources of external financing is a first order question in corporate finance. While there has been a lot of work to date on corporate equity ownership and control around the world (e.g., La Porta et al. (1998), La Porta et al. (1999), Aminadav and Papaioannou (2020)), corporate debt structures have received less attention. Given that debt represents about 85% of the external financing of firms (Beck et al. (2008)) and debt structures determine the allocation of power and assets in financial distress and bankruptcy, it is important to study corporate debt structures around the world.

Debt structures are complex and multidimensional. For instance, some firms borrow from a single bank, using loans or credit lines; others borrow from multiple banks; others issue bonds to arm's length investors; and others borrow using a combination of debt classes from a multiplicity of borrowers. A sizable literature has studied various individual aspects of firms' debt structures across countries, but the literature has yet to reach a consensus, some times even on basic correlations, due to a number of empirical challenges.

The first challenge is that no single database covers all possible debt contracts and reports the identity of all lenders. Datasets covering bank debt contracts either focus on specific debt markets, e.g., individual bank loans (Ongena and Smith (2000), Detragiache et al. (2000)), or the syndicated loan markets (Esty and Megginson (2003); Qian and Strahan (2007); Bae and Goyal (2009)), and do not cover arm's length contracts. Conversely, datasets covering bond issuances do not cover bank debt (Manconi et al. (2016), Bretscher et al. (forthcoming)). Furthermore, datasets covering different debt classes typically do not record the identity of the lenders (Colla et al. (2013); John et al. (2021)). Finally, datasets covering capital structure do not distinguish among debt classes and do not record the identity of the lenders (Demirgüç-Kunt and Maksimovic (1999), Giannetti (2003), Fan et al. (2012)).

A second challenge relates to sample size and composition. Some of these datasets cover predominantly large firms, others cover small-to-medium size firms. A third challenge is

heterogeneity with respect to size and age of sample firms, as the size distribution of firms is highly skewed, and private and public firms at different stages of their life cycle differ systematically in their debt structure. Finally, unlike in the case of equity, no regulation mandates the disclosure of large blocks of bond holdings in excess of some threshold. As a result, reconstructing the full debt structure of firms is challenging, as it is possible to miss sizeable untraded or privately placed blocks of debt.

We make progress on each of these fronts by combining for the first time different databases including Amadeus, Capital IQ, Dealscan, eMaxx, and LSEG Refinitiv to reconstruct the structure of outstanding debt at the firm level, including bank loans, syndicated loans, bonds, credit lines, and by collating this information to reconstruct as large a fraction as possible of the outstanding debt ownership. We end up with a comprehensive dataset reconstructing the debt structure of 10,136 firms operating across 52 countries from 2002 to 2021, which comprises 124,101 corporate bond issues held by 63,323 bondholders and 85,817 bank loans and credit lines extended by 10,154 banks.

Debt structures allocate power across creditors and between creditors and debtors. Economic theories of creditor power start from the observation that when lenders can more easily force repayment, repossess collateral, or even gain control of the firm following non-repayment ex post, they are more willing to lend ex ante. These power theories of credit have been formalized in a one-creditor context by Townsend (1979), Aghion and Bolton (1992), and Hart and Moore (1994, 1998).

Building on this framework, there are two views of debt structure and creditor power in a context of creditor multiplicity. Under one view, high debt ownership dispersion substitutes for low investor protection. The reason is that debt ownership dispersion protects creditors against strategic default (Bolton and Scharfstein, 1996), which makes dispersion valuable at low levels of investor protection where strategic default is problematic (Diamond, 2004). Diamond (2004) also emphasizes that when investor protection is low creditors should protect themselves by lending at short maturity.

Under another view, high debt ownership dispersion is an outcome of high investor protection. The key idea here is that small, diversified investors can only be prevalent when investor protection is high (La Porta et al., 2008, 1998). Gennaioli and Rossi (2013) present a model where concentrated debt with exclusive control rights over the liquidation/reorganization decision coexists with dispersed junior creditors without control rights. In such a model, dispersion of junior debt protects the borrower against inefficient liquidation, which makes dispersion valuable at relatively high levels of investor protection, where rescuing profitable firms ex post is valuable. Gennaioli and Rossi (2013) also emphasize how securing debt with collateral should be easier when investor protection is higher.

While the two views yield opposite predictions on the dispersion of total debt ownership, the two views are not necessarily mutually exclusive, at least as soon as one recognizes that Bolton and Scharfstein (1996) and Diamond (2004) model a single debt class of "large" creditors without considering the allocation of control rights over the liquidation/reorganization decision, whereas Gennaioli and Rossi (2013) study the allocation of control rights and allow for multiple classes of debt, but do not consider debt maturity.

In this paper, we focus on five aspects of the debt structure related to creditor power: What determines the number of creditors a firm borrows from? What determines how many classes of debt firms use? What determines the maturity of (different types of) debt contracts? What determines the allocation of security interests among creditors and debt types? What determines the currency of debt contracts? Our analysis shows that there are large differences in debt structures across legal families and yields the following results.

(i) Total debt ownership is most concentrated in civil law countries, and it is most dispersed in common law countries. There is significant heterogeneity with respect to debt types: ownership dispersion in arm's length debt is largest in common law countries, whereas, if anything, firms borrow from more banks in civil law countries. Hence, the result that total debt ownership dispersion is largest in common law countries is driven by bond ownership dispersion. This is a novel result. As we discuss below in detail, prior

literature has examined only bank debt, documenting the opposite result of higher total debt ownership dispersion in civil law countries.

(ii) Firms in civil law countries borrow at shorter maturity. When distinguishing between bank debt and arm's length debt, we find that firms in common law countries issue bonds at significantly longer maturity; whereas bank loans and credit lines have very similar maturity across legal origins. As a result, the finding that maturity is shorter in civil law countries is driven by the maturity of arm's length debt.

(iii) Firms in common law countries are more likely to have their debt secured by some collateral. When distinguishing between bank debt and arm's length debt, we find that firms in common law countries are more likely to have secured bank debt, whereas arm's length debt is similarly (un-)secured in common law and civil law countries.

(iv) Firms in civil law countries are more likely to borrow in USD-denominated debt contracts. The USD-denominated proportion of both bank loans and arm's length debt is larger in French civil law countries. On the other hand, German civil law countries borrow in local currencies.

(v) Whereas total corporate leverage is similar in common law and civil law countries, firms in civil law countries are more likely to borrow from banks and less likely to issue arm's length debt than firms in common law countries.

Next, we examine the correlation between corporate control and institutional characteristics that legal origin theories emphasize in a simple, unified framework, employing multiple proxies for institutional quality to account for specific theoretical predictions. Namely, the creditor rights index (Djankov et al. (2007)) measures the rights of secured creditors in bankruptcy, and we use it accordingly to examine cross-country variation in secured debt. On the other hand, the anti-self-dealing index (Djankov et al. (2008b)) measures the legal protection available to minority investors against managerial self dealing in terms of both

disclosure and enforcement, and although it is defined specifically for minority shareholders it is likely also relevant for dispersed, arm's length creditors.[1] Although the cross-country associations are not well suited to advance causality, they are informative on the characteristics of the legal and institutional environment that relate to corporate debt structure.

(vi) Anti-self-dealing measures, namely, corporate law provisions allowing investors to take legal action against corporate insiders who abuse their position, are systematically linked to debt ownership dispersion. The correlation is not particularly strong in the full sample, but it masks considerable heterogeneity. For all but the firms in the largest size quartile, better anti-self-dealing provisions strongly correlate with higher total debt dispersion, and with higher dispersion in arm's length debt ownership. By contrast, for all firms, and particularly for the larger ones, better anti-self-dealing provisions correlate with lower bank ownership dispersion. That is, the stronger the investor protection, the more dispersed total debt ownership and public bond ownership; but the smaller the number of banks a firm borrows from.

(vii) Anti-self-dealing provisions are systematically linked to corporate debt maturity. This correlation masks considerable heterogeneity, too. Stronger investor protection is correlated with longer maturity of arm's length debt. The effect is largest for the smallest firms, declines monotonically with firm size, and remains strongly significant for all but the largest firm size quartile. Total debt maturity increases with investor protection, but the effect is significant only for small-to-medium size firms. On the other hand, the maturity of bank debt is, if anything, slightly decreasing with investor protection, particularly for larger firms, although the economic significance of this effect is small.

(viii) Creditor rights correlate with the extent to which corporate debt is secured by collateral. The stronger the creditor rights, the larger the likelihood that total debt is secured by

[1] Using the anti-self-dealing index to assess the dispersion of arm's length creditors is exactly in line with the predictions of the theoretical model of Gennaioli and Rossi (2013), who write "The notion of investor protection relevant for this prediction is broader than that of creditor rights and includes shareholder protection against managerial self-dealing and tunneling" (p.624).

collateral. This result is driven entirely by bank debt.

In a nutshell, our results highlight that in countries with stronger investor protection the debt structure features dispersed debt ownership, with dispersed arm's length borrowing coexisting with concentrated bank debt. In countries with weaker investor protection, firms mitigate the unfavorable institutional environment by borrowing at shorter maturity, and by borrowing in USD denominated (foreign) debt. Furthermore, our analysis highlights that investor protection is particularly relevant, indeed crucial, for small-to-medium size firms; whereas the largest firms are able to access international investors–and the protection of US courts–almost irrespective of their country of incorporation. The considerable heterogeneity that we uncover along debt types and firm size thus supports the importance of considering at the same time different sources of debt, including bank loans, credit lines, and arm's length debt, to obtain a full picture of firm's debt structure around the world.

Our results are consistent with legal origin and contracting theories of corporate finance (La Porta et al. (1998), Diamond (2004), Djankov et al. (2007), Djankov et al. (2008a), Gennaioli and Rossi (2013)). Consistent with La Porta et al. (1998) and La Porta et al. (2008), we find that debt ownership dispersion is largest in countries with better investor protection. In particular, our results are consistent with Gennaioli and Rossi (2013), who rationalize the coexistence of concentrated bank debt and dispersed arm's length debt in the firm's debt structure, and predict that dispersion of total debt and arm's length debt should increase with investor protection.

Our results are also consistent with theories of financial contracting. In particular, our results are consistent with the prediction of Diamond (2004) that firms in poor investor protection countries should mitigate the unfavorable institutional environment by borrowing more short term. Our results are also consistent with the prediction from prior literature that firms in poor investor protection countries should borrow from more banks, e.g., see Diamond (2004) and Bolton and Scharfstein (1996)), although our empirical results highlight that in countries with stronger investor protection arm's length borrowing is more prevalent–and

much more dispersed–than bank borrowing.

**Related literature.** Our paper contributes to the literature on the corporate debt structure. Ongena and Smith (2000) examine bank debt in a cross section of countries; Detragiache et al. (2000) examine the number of bank relationships of Italian firms operating in regions with different enforcement costs; whereas Esty and Megginson (2003), Qian and Strahan (2007), and Bae and Goyal (2009) focus on syndicated loans. These papers find that firms borrow from more banks in countries with weaker investor protection, and interpret their evidence in line with the models of Bolton and Scharfstein (1996) and Diamond (2004) in which firms borrow from multiple creditors to prevent strategic default, and in which strategic default is a more relevant concern in countries with weaker investor protection. We confirm the result from this literature that, *when looking at bank debt in isolation*, bank debt dispersion and the number of banks is larger in civil law countries, and in countries with weaker investor protection; but we show that the picture changes dramatically and we obtain diametrically opposite results when considering total debt ownership, including the ownership of arm's length debt, in line with the predictions of La Porta et al. (1998), La Porta et al. (2008), and Gennaioli and Rossi (2013).

Regarding debt maturity, Demirgüç-Kunt and Maksimovic (1999), Giannetti (2003), and Fan et al. (2012) examine corporate borrowing and find that the fraction of short term (as opposed to long term) debt is larger in countries with weaker investor protection (see John et al. (2017) for an opposing view). More recently, examining syndicated loan contracts Qian and Strahan (2007) and Bae and Goyal (2009) document a more nuanced picture. Qian and Strahan (2007) document that English common law countries have a 1-month longer maturity of bank loans than French civil law firms (see their Table 1), but a slightly shorter maturity in German and Scandinavian legal origin countries; in regression analysis, Qian and Strahan (2007) conclude that firms borrow with longer maturities in countries with stronger creditor protection. Bae and Goyal (2009) reach similar conclusions, although arguing that it is enforceability of contracts that drives longer debt maturity rather than creditor rights.

Our analysis builds on Qian and Strahan (2007) who emphasize heterogeneity with respect to firm size; we confirm the importance of heterogeneity with respect to firm size, and in addition we underscore the key role of heterogeneity with respect to debt types. That is, when examining bank borrowing in isolation, we confirm the picture that French civil law countries have a shorter maturity than English civil law countries, although the results are statistically insignificant and their economic magnitude is small. However, when examining arm's length borrowing and total borrowing, the picture changes dramatically, in that firms in common law countries borrow with a much longer maturity, and the result is particularly strong for arm's length debt and for small-to-medium size firms.

Regarding debt classes, John et al. (2021) find that firms from countries with stronger creditor protection choose debt structures with fewer debt types and interpret their result as being in line with predictions of Bolton and Scharfstein (1996) that debt structures should be more dispersed in countries in which strategic default concerns are higher. We show instead that when one examines direct measures of debt ultimate ownership rather than aggregate measures of debt classes, the overall conclusions change dramatically.

Finally, our results contribute to the literature on debt currency, which emphasizes the role of the US dollar as the key anchor of exchange rate regimes, e.g., see Maggiori et al. (2024) and references therein. Our results underscore the importance of borrowing in US dollars for firms located in French civil countries to be able to access the protection of US courts, in line with the legal ruling studied in Hébert and Schreger (2017).[2]

The rest of the paper is organized as follows. Section 2 details the data sources and the

[2]A recent and growing empirical literature has examined the effects of financial reform, in particular changes to creditor protection under corporate bankruptcy laws in individual countries, on various firm-level outcomes, including firms' debt structures. See, among others, Scott and Smith (1986), Hackbarth et al. (2015), and Kornejew (2024) for the US, Lilienfeld-Toal et al. (2012) and Vig (2013) for India, Araujo et al. (2012), Assunção et al. (2014), and Ponticelli and Alencar (2016) for Brazil, Cerqueiro et al. (2016) for Sweden, and Rodano et al. (2016) for Italy. While these individual-country studies have been advancing causality by exploiting variation among treated vs untreated firms, they have examined a wide array of heterogeneous reforms and firm-level outcomes; as a result, external validity and comparability of results across countries and reforms may be problematic. We complement these approaches by providing a simple, unified framework across a large number of countries to provide a panoramic analysis of the association between corporate debt structure and legal protection of investors.

construction of our final sample. Section 3 presents the main patterns of corporate debt structure around the world. Section 4 reports our empirical results. Section 5 concludes.

# 2 Data and Methodology

We construct a novel dataset on the corporate debt structure of firms around the globe. To that end, we combine data from various data providers. That is, in a first step, we obtain detailed information on the debt structure of international firms from Capital IQ. We then merge this data with quarterly balance sheet information from Worldscope, Compustat Global, and Amadeus. Further, we complement the sample with information on the nature and ownership of bond issues and commercial papers from eMAXX and details on loans and lines of credit, along with information on the lenders of these facilities, from LPC Dealscan. The resulting dataset contains information on the debt structure of 10,136 firms operating across 52 countries from 2002Q2 to 2021Q3. In the following, we discuss in detail the various steps of our sample construction. In what follows we describe in detail the various steps to build our dataset in subsections 2.1, 2.2, 2.3, and 2.4, and we discuss our measures of debt ownership concentration in subsection 2.5.

## 2.1 Debt Structure Information

As outlined above, we first obtain detailed debt structure information for the universe of firms in *Capital IQ*. As reported in Table 1, Capital IQ contains information on 135,807 firms (42.7% of which are public). This data includes the quarterly breakdown of total debt into seven distinct categories: commercial paper, drawn credit lines, term loans, bonds and notes, capital leases, trusts, and a residual category encompassing other types of debt. In our analysis, we rely on the unique company identifier "companyid" provided by Capital IQ which helps us identify duplicate balance sheet information that exist in at least two of Amadeus, Worldscope and Compustat.

## 2.2 Balance Sheet Information

In a second step, we retrieve quarterly balance sheet information of all international firms available in either *Worldscope*, *Compustat Global*, or *Amadeus*. Subsequently, we exclude firm-quarters from our sample which have missing or non-positive values for either total assets or total debt, or reported book leverage outside the unit interval. Moreover, since our ownership data is organized in calendar quarters, we map balance sheet information from fiscal quarters to calendar quarters based on the month in which the fiscal quarter concludes. For example, if a company's fiscal quarter concludes in January, February, or March of 2010, we assign that firm's quarterly balance sheet information to the first quarter of 2010, i.e. 2010Q1.

The merging of Capital IQ with the combined data from Worldscope, Compustat Global, and Amadeus is carried out in several steps. First, we merge the entire Capital IQ dataset with Worldscope. Each firm in Worldscope is matched with its corresponding companyid, as detailed in Appendix Section A.3.1. Following the approach outlined by Colla et al. (2020), we then eliminate firm-quarters for which the absolute percentage difference between total debt reported in Worldscope and the sum of debt types reported in Capital IQ exceeds 10%.

Next, we turn to the remaining Capital IQ observations that did not successfully match with Worldscope and attempt to merge them with Compustat Global. Similarly, we merge these observations with Compustat and discard firm-quarters where the discrepancy between total debt reported in Compustat and the sum of debt types reported in Capital IQ exceeds 10% of Compustat total debt. For unmatched Capital IQ entries of European firms, we employ an analog methodology using the financial statements sourced from Amadeus.[3]

Retaining firm-quarter observations with successful merges either in Worldscope, Compustat Global, and Amadeus and eliminating any duplicates leaves us with approximately 2.4 million firm-quarter observations, representing 85,576 unique firms across 145 countries

[3]In a first step, our integration with Amadeus relies on firms with non-missing ISINs. In a second step, we manually match firms which results in an additional 572 matched firms. Please see the details in Appendix Section A.3.1.

as can be seen in Table 1. Notably, about 61% of this sample comprises public firms, with the remaining 39% being private firms.

## 2.3 Debt Ownership Information

Next, we merge our data on debt ownership information. To that end, we obtain direct ownership information of **arm's length debt** (commercial papers, bonds, and notes) from *Thomson Reuters eMAXX*, which offers extensive coverage of institutional investors' fixed-income holdings at the security level. Importantly, these holdings are not limited to publicly traded securities but also include privately placed debt instruments such as 144A and Regulation S bonds, which have become more common in recent years, e.g., see Ellias and De Fontenay (2025). This database primarily includes asset holdings of insurance companies, mutual funds, ETFs, and pension funds.[4] That is, for each calendar quarter, the dataset contains debt ownership data as well as information about the securities themselves and their issuers. When available, we rely on CUSIP as a primary identifier for a security. If CUSIP is not available, we use CINS as an identifier.[5] The first six digits of CUSIP/CINS do not allow to unambiguously identify the issuer for at least two reasons. First, the issuer identifier might change over time due to corporate events. As a result, the 6-digit CUSIP/CINS is different for outstanding securities and new issues. Second, depending on the offering type and market, the same issuer might be assigned several 6-digit identifiers.[6] To overcome this problem, we use Refinitiv Python API and get the issuer PermIDs of all securities contained in eMAXX. This allows us to uniquely retrieve the "companyid" of the issuing firm from our Worldscope-Capital IQ merge which renders merging of ownership information from eMAXX with data on firm fundamentals straightforward. A more detailed discussion on this procedure can be

[4]With some exceptions, the eMAXX database does not include holdings of hedge funds and banks.

[5]The CUSIP International Numbering System (CINS) is a 9-character alphanumeric identifier denoting international securities and is an extension of the CUSIP system used for U.S. and Canadian securities. CINS employs the same nine characters as CUSIP but also contains a letter of the alphabet in the first position, denoting the issuer's country or geographic region.

[6]For example, Microsoft has US bonds with CUSIPs starting with 594918 and 00507V and Eurobonds with CINS that start with U59340.

found in Appendix Section A.3.

To compile data on **bank debt** ownership, we obtain data from *LSEG Loan Connector* which is part of *DealScan*. This data contains comprehensive historical information on loan characteristics, contract details, terms, and conditions. We focus on the entire DealScan universe to ensure that we capture loans which had been issued before the start of our sample but have not been fully repaid. Unlike eMAXX, which organizes the data as a quarterly panel, DealScan is an event-based dataset. That is, each unique observation corresponds to a distinct combination of $Lender \times Borrower \times Tranche \times Amendment$. Therefore, we first have to re-organize the information contained in DealScan in a quarterly panel. To do so, we assume that, for each tranche, the composition of lenders and the lenders' share in total lending would remain unchanged over time, unless, 1) there is a new amendment to the loan, in which case, we obtain an updated list of lenders; 2) the face value of the loan has been fully repaid; 3) the loan has reached its maturity date. These assumptions can be partially justified by the fact that only around 20% of syndicated loans are traded in secondary markets, as highlighted in (Brealey et al., 2020, Ch. 24, p. 649). In addition, only about one quarter of syndicated loans are eligible for secondary market trading in the US. In Europe and Asia this fraction is even lower.[7] Therefore, the composition of lenders of syndicated loans remains relatively stable over time.

For each quarterly observation of a loan, we calculate the remaining outstanding notional by taking into account the specified repayment schedule. These repayment schedules varied in installment frequency, ranging from weekly to once every three years. For cases where the repayment schedule is missing, we either assume a proportional repayment of all the outstanding loans with missing repayment schedules or a bullet payment at maturity. Distinguishing between proportional repayment and bullet repayment is made possible by comparing the observed outstanding Dealscan loans to the corresponding total outstanding

[7] As per information from the Bank of International Settlements. Refer to "The Syndicated Loan Market: Structure, Development and Implications" available at www.bis.org/publ/qtrpdf/r-qt0412g.pdf

loans from Capital IQ. Specifically, if the observed outstanding Dealscan loans amount to less than the total outstanding loans recorded in Capital IQ for the respective observation period, we assume a bullet repayment at maturity for these loans. Conversely, if the outstanding Dealscan loans exceed those in Capital IQ by $x\%$, it is assumed that $x\%$ of these loans have been fully repaid up to the current quarter.

DealScan does not report the type of lenders individually for each loan and instead reports the "union" of all lender types participating in each Tranche[8]. To circumvent this issue, we employ a sequential approach. That is, first we focus on loans with only one lender. For this subsample, we directly observe a one-to-one mapping between lenders and types. Building on this, in a second step, we use data on loans with two lenders where we know one lender's type from the first step, which allows us to determine the second lender's type. This iterative procedure allows us to determine the types of 95% of the lenders in DealScan. The remaining 5% of lenders we label as "Other." We then compute lender-specific ownership. For approximately one third of all the loans in DealScan, we have explicit information on each lender's ownership. For the remaining loans, we assume equal contributions of all participating lenders.

Finally, we merge bank loan ownership information and the existing data. To do so, we follow a two-step process. First, we use the PermID to companyid linking table that we have previously compiled by combining several linking tables provided by Capital IQ and Refinitiv. For a more detailed discussion on this, we refer to Appendix Section A.3.1. Second, we employ the linking table provided by Chava and Roberts (2008).[9] As reported in Table 1, combining firm fundamentals with debt ownership data leaves us with 18,104 firms (about 57% are public firms) domiciled in 108 different countries.

[8]The various lender types in DealScan include commercial banks, investment banks, other types of banks, insurance companies, distressed (vulture) funds, mutual funds, pension funds, hedge funds, trusts, and private equity.

[9]The linking table of Chava and Roberts (2008) is based on the legacy version of DealScan. Therefore, the borrower company identifiers must be updated according to the revamped version.

## 2.4 Final Data Set

Our final dataset combines information from Capital IQ; quarterly balanced sheet data from Worldscope, Compustat Global, and Amadeus; arm's length debt ownership data from eMAXX; and bank debt ownership data from DealScan. As our paper aims at studying the corporate debt structure around the world, we would like to focus on firms for which we have ownership data for a significant fraction of their total debt. To that end, we apply two more filters in our sample construction which limits our attention to firms for which we identify 1) the debt instruments of at least 50% the book value of the firms' total debt; and 2) the owners of their debt for at least 30% of the book value of the firms' total debt. That is, in summary, a hypothetical firm A is included in our sample in quarter $t$ if and only if the following criteria are met:

1. Capital IQ contains data on the debt structure of firm A for quarter $t$;
2. Worldscope, Compustat Global, or Amadeus contain balance sheet data of firm A for quarter $t$;
3. The relative percentage difference between the total debt reported in Capital IQ and the balance sheet is less than 10%;
4. Debt instruments identified through eMAXX and DealScan account for at least 50% of firm A's total debt amount outstanding according to the balance sheet;
5. Debt ownership must be known for at least 30% of firm A's total debt amount outstanding according to the balance sheet.

After applying these criteria, we exclude all observations from countries for which we have data on fewer than ten distinct firms. As reported in Table 1, our final sample includes 127,179 firm-quarter observations for 10,136 unique (about 55% are public firms) firms in 52 countries.

It is important to note that, despite merging several data sets from different sources and applying many filters when constructing the data, our final sample does not look that different than the sample of firms which we used as "population", i.e., the universe of firms contained in Capital IQ. As reported in Table 1, for example, the share of public firms is 55% in our final sample which compares to 43% in the Capital IQ sample. Given the fact that data availability is typically much better for public compared to private firms, this increase in the share of public firms seems quite small. Moreover, the slight increase in the share of arm's length debt and credit lines in the final sample compared to the starting sample suggests that our sample features relatively more large firms compared to the population. Again, this shouldn't come as a surprise as generally, data is more easily available for larger firms. Importantly, however, applying our filters four and five above does not materially change neither the average debt structures nor the average leverage of our sample firms.

Figure 1 shows the global average capital structure and debt structure for our pooled sample, including the composition of various debt types. The debt categories comprise arm's-length debt, bank loans, credit lines, and other forms of debt. Figure 1 documents average leverage, measured as total book debt divided by total assets, is 32.2%. When examining debt types as a percent of total book debt, bank loans are 34.8%, arm's length debt is 29.2%, credit lines are 21%, and other types collectively amount to 15.1%.

Figure 2 reports the global evolution over 2002-2021 of leverage and debt structure. It shows that average leverage is quite stable over 2002-2021, hovering around 30-to-33% of total assets. On the other hand, in terms of debt structure over time we observe a gradual substitution of bank loans and–to a lesser extent–arm's length debt for credit lines. In fact, credit lines steadily decline from about 30% of total debt in 2002 to about 15% in 2021, whereas bank loans increase from 27% to 36% and arm's length debt from 27% to 32%.

## 2.5 Measures of Ownership Concentration

To quantify the extent of concentration in debt ownership, we rely on four well-known measures of ownership concentration, originally developed in the literature on equity ownership. That is, we use for our analysis the number of creditors, the minimum number of creditors required to cross 10%, 20%, and 30% of debt ownership, the Herfindahl-Hirschman Index (HHI), and the cumulative ownership of the one, three, five, and ten largest lenders.

Our first concentration measure, the *number of total creditors*, is relatively uncontroversial both to measure as well as to interpret (see, for example, Li and Yu (2022)). That is, a lower (higher) number of creditors indicates a higher (lower) degree of ownership concentration.

Second and relatedly, the *minimum number of creditors required to cross a certain ownership threshold* is defined as follows:

$$NtC_{X\%} = min\{n \ s.t. \sum_{i=1}^{n} \omega^i \geq X\%\} \tag{1}$$

where $NtC$ stands for "$N$umber $t$o $C$ross", $\omega^i$ denotes the cumulative ownership share in percent of the $i$-th largest lender, and $X\%$ denotes the ownership threshold. For the ownership threshold we consider 10%, 20%, and 30%, respectively. A low (high) number of creditors to cross a certain ownership threshold indicates higher (lower) degree of ownership concentration (Franks et al., 2009).

Third, the *Herfindahl-Hirschman Index (HHI)* represents the sum of squared fractional holdings of creditors, calculated relative to the total debt for which we observe ownership in a given firm and quarter. That is,

$$HHI = \sum_{i=1}^{n} \omega^{i2}, \tag{2}$$

where $n$ is the total number of observed creditors and $\omega^i$ denotes the ownership share of $i$-th largest lender as a fraction of total debt for which we observe ownership. That is, a high (low)

HHI indicates high (low) degree of ownership concentration. This methodology aligns with previous studies that rely on observations where less than 100% of the underlying ownership is observed (see, for example, Li and Yu (2022)). HHI for bank debt and bond debt (also referred to as arm's length debt) is defined in an analogously. That is, the denominator of fractional holdings are total bank debt with observed ownership and total arm's length debt with observed ownership, respectively.

Importantly, using the total amount of underlying debt in the denominator of fractional holdings, rather than the total amount for which we ownership, would inevitably bias the resulting HHI downward. The magnitude of this bias is directly related to the fraction of debt with unobserved ownerships. Instead, we derive an unbiased estimator under the assumption that the ownership concentration we observe is representative for the ownership concentration of all creditors of a firm. The fifth criterion in our final sample construction guarantees that we retain only those observations for which we have full information on a substantial fraction of debt. Moreover, when calculating HHI statistics for bank and bond debt separately, we apply a similar criterion. Specifically, we calculate the HHI for bank and arm's length debt only for firm-quarters for which we have ownership information for at least 30% of total arm's length debt.

Finally, we calculate the cumulative ownership measures in line with Franks et al. (2009) as follows:

$$C1 = \omega^1 \tag{3}$$

$$C3 = \sum_{i=1}^{3} \omega^i \tag{4}$$

$$C5 = \sum_{i=1}^{5} \omega^i \tag{5}$$

$$C10 = \sum_{i=1}^{10} \omega^i \tag{6}$$

where, as above, $\omega^i$ denotes the ownership share in percent of the $i$-th largest lender. That

is, a higher (lower) value for the measures $C1$ to $C10$ indicates a higher (lower) ownership concentration. Analogous to the HHI, the ownership shares are relative to the total amount of debt for which we have ownership information. Moreover, for statistics specific to bank or arm's length debt we require to observe ownership information for at least 30% of total bank or arm's length debt outstanding to avoid any downward bias. For a more detailed discussion of our variable definitions, please see Appendix Table A.1.

# 3 Patterns

We aim to provide the most up-to-date characterization of corporate debt structure around the world. In this Section, we report descriptive statistics of corporate debt structure by legal origin.

## 3.1 Summary Statistics

Figure 3 provides a map of corporate debt structure around the world for four legal origins, namely English common law, Scandinavian civil law, German civil law, and French civil law, following the classification in La Porta et al. (2008). The map illustrates the considerable heterogeneity in debt structure around the world. Two clear patterns emerge: 1) English common law firms borrow predominantly using arm's length debt; 2) Civil law firms borrow predominantly using bank loans.

To dig deeper, Table 2 reports detailed summary statistics for our final sample, for each country individually and for the four legal origins. Average leverage is quite similar across legal origins, about 33-to-34% of assets in both French civil law and English common law countries, and not far from that in German and Scandinavian countries. Table 2 substantiates the considerable heterogeneity in debt structure around the world illustrated in Figure 3. In fact, firms in English common law countries borrow predominantly using arm's length debt at 36% of total debt, followed by bank loans at 26% and credit lines at 24%. On the other

hand, bank loans amount to 55% of total debt in French civil law countries and even 62.6% in German civil law countries. By contrast, arm's length debt amounts to 16% of total debt in French civil law countries and a meager 3% in German civil law countries.

The last two columns of Table 2 show that we identify on average about 80% or more of firms' debt instruments and we have ownership data on average for about 70% of firms' total debt outstanding. This gives us confidence that our data is rich enough to make precise statements about the firms included in our final sample. About 45% of the firms in our sample are in the US (4449 firms). For this reason, we perform extensive robustness tests excluding US firms, and we find very similar results to those we report here using the pooled sample. Finally, while we observe both public and private firms in all countries, the share of public firms is much lower in English common law countries compared to the other three legal origins.

## 3.2 Debt Ownership Concentration

Figure 4, Panels A, B, and C, illustrates the differences in the distribution of debt ownership concentration between English common law and French civil law countries using the number of creditors measure, separately for bank debt, arms length debt, and total debt, respectively.

Panel A shows that firms in French civil law countries borrow from more banks than firms in English common law countries. The interpretation is that bank debt ownership is more concentrated in English common law countries than in French civil law countries. This pattern is in line with prior literature that examine bank lending across countries such as Esty and Megginson (2003), Qian and Strahan (2007), and Bae and Goyal (2009).

Panel B shows that the pattern dramatically reverses when considering ownership of arm's length debt, as firms in English common law countries borrow from many more bondholders than firms in French civil law countries, implying firms in English common law countries have more dispersed arm's length debt ownership than firms in French civil law countries. Panel C shows that this pattern carries over to total debt ownership concentration, as firms

in English common law countries borrow from many more overall creditors, and have thus much more dispersed debt ownership, than firms in French civil law countries.

Figure 5 and Figure 6 reports the exact same patterns using the C5 and the $NtC_{30\%}$ measures of debt ownership concentration. Firms in French civil law countries have more dispersed bank ownership than firms in English common law countries, as the collective debt ownership of the top 5 banks is smaller in French civil law countries than in English common law countries, and the number of banks needed to cross the 30% debt ownership threshold is larger in French civil law countries than in English common law countries, consistent with prior literature. However, this pattern dramatically reverses when examining arm's length debt ownership and total debt ownership: firms in English common law countries have a much more dispersed ownership of arm's length debt and of total debt than firms in French civil law countries, also using the C5 and $NtC_{30\%}$ measures.

Figure 7 examines the evolution over the firm's life cycle of leverage (Panel A), debt structure (Panel B), and debt ownership concentration (Panel C). Here, year 0 denotes the year the firm is established. The Figure shows that while leverage is quite stable over the firm's life cycle (Panel A), debt structure displays a substitution of arms' length debt for bank loans and credit lines, as arm's length debt starts picking up at about year 60 of the firms' life (Panel B). Panel C shows that as soon as arm's length debt starts picking up, the firms' debt ownership concentration also decreases sharply, at least in terms of overall number of creditors, and number of creditors needed to cross the 30% threshold.

Table 3 reports bank debt ownership concentration statistics by individual countries and legal origins. It shows that both the number of loan tranches as well as the number of loans is smaller for firms in English common law compared to firms in civil law legal origins. The number of lead arrangers in syndicated loans is also lower in firms in English common law countries (on average about 3) compared to firms in French civil law countries (on average about 6.3).

Table 3 also reports a larger set of measures of bank debt ownership concentration, and

they confirm the patterns shown above for number of creditors, C5, and $NtC_{30\%}$ also for other measures. For example, we find for firms in English common law countries compared to firms in French civil law countries a higher HHI (25.05% vs 21.47%) and lower numbers required to cross the 10% (1.18 vs 1.19), 20% (1.76 vs 1.81), and 30% (2.43 vs 2.55) ownership thresholds. That is, all measures point to the fact that the ownership concentration of bank debt is on average *higher* for English common law countries, consistent with prior literature.

Our main innovation is to examine together debt ownership not only of bank loans and credit lines but also of bonds and in general of arm's length debt. We show that by doing so the picture changes dramatically relative to prior literature, reversing the conclusions reached so far. Table 4 shows that the patterns on the ownership concentration of arm's length debt are diametrically opposite to the patterns for bank debt. That is, the number of overall bondholders and the minimum number of bondholders required to pass a cumulative ownership of 10%, 20%, or 30%, respectively, are all clearly higher for English common law countries. The economic magnitude is stark. For example, the average number of bondholders across firms in English common law countries equals 163 and compares with the average of about 23 bondholders across firms in civil law countries. Consistent with this clear empirical pattern, the average HHI for firms in English common law countries is well below the average HHI for firms in French civil law countries (5.05% vs 8.16%). Therefore, we find that bond debt ownership in firms in English common law countries is much *less* concentrated than in firms in civil law countries.

This finding is the exact opposite of what we just documented for bank loan ownership concentration above. Notably, the English common law statistics are quite stable throughout a number of countries, including Canada, Bermuda, Ireland, Jersey, United Kingdom, and the United States. In these countries, on average, a) bond debt makes up for an economically meaningful fraction of overall debt (26% for Ireland to 42% for the United States), and b) we observe ownership information for a significant fraction of total bond debt (42% for Jersey to 61% for the United States). At the same time, the results are not driven by US firms,

as we obtain very similar results if we exclude US firms from the sample. These exercises alleviate the concern that the common law results are driven entirely by a single country or a few outliers.

Next, we show how bank and arm's length debt aggregate to total debt and, thus, we document ownership concentration of total debt of firms. Table 5 reports statistics by individual countries and by legal origins. Importantly, across all our sample countries, on average, we have debt ownership information for about 73% of total debt (this percentage is lowest for Colombia with 52.60% and highest for New Zealand with 87.47%). This observation suggests that our empirical evidence is representative for the corporate debt concentration of our sample firms. Overall, we find that debt ownership in firms in English common law countries is on average *less* concentrated than in firms in other legal origins. This conclusion is consistently backed up by all of our four measures of ownership concentration when comparing average values across English common law and French civil law countries. In English common law countries the 1) the number of all creditors is higher (173 vs 66), 2) the minimum number of creditors to cross the ownership thresholds of 10%, 20%, and 30% are higher (1.51 vs 1.27, 2.75 vs 2.04, and 4.42 vs 3.02), 3) the HHI is lower (17.79% vs 18.90%), and 4) the cumulative ownership of the 1, 3, 5, and 10 largest creditors are lower (22.79 vs 23.82, 36.16 vs 40.11, 52.09 vs 60.03, and 69.66 vs 80.84).[10]

To sum up, our data confirms the results about ownership dispersion of bank debt from the literature. Importantly, however, we find that the patterns of ownership dispersion of total debt are diametrically opposite. When considering arm's length debt and thus total debt, our empirical evidence points to the striking fact that ownership dispersion of total debt and arm's length debt is much more dispersed in firms in English common law countries than in firms in other legal origins, that is, exactly the opposite of what was documented regarding bank debt. Intuitively, total debt ownership dispersion is driven by the dispersion of arm's length debt because of the quantitative importance of arm's length debt in the debt

[10]The results are even stronger when comparing firms in English common law countries with firms in German civil law countries.

structure of our sample firms, and particularly of firms in English common law countries. Therefore, our comprehensive data allows us to paint a much more nuanced picture of debt ownership dispersion compared to existing studies which exclusively relied on bank debt to make inference about debt ownership dispersion, including Ongena and Smith (2000), Esty and Megginson (2003), Qian and Strahan (2007), and Bae and Goyal (2009).

### 3.2.1 Debt Maturity

Figure 8 reports the distribution of debt maturity, separately for bank debt (Panel A), arms length debt (Panel B), and total debt (Panel C), comparing firms in French civil law countries and firms English common law countries. For each firm, we obtain a single measure of maturity based on weighted average of the maturity of the relevant debt instruments outstanding. Panel A shows that bank debt maturity is slightly shorter in firms in French civil law countries relative to firms in English common law countries, although the magnitude of the difference is small. Panel B shows that arm's length debt maturity is much shorter in firms in French civil law countries relative to firms in English common law countries, and Panel C confirms this pattern for total debt maturity.

Table 6 reports detailed statistics for debt maturity both for individual countries and for legal origins. The average maturity across all sample countries is 4.88 years for total debt, 7.78 years for arm's length debt, and 3.05 years for bank debt. Importantly, however, there is substantial cross-sectional variation in debt maturity across countries and, in particular, across legal origins. For example, total debt maturity is substantially longer (5.39 years) for firms in English common law countries compared to firms in civil law countries (3.40 years).[11] Consistent with this, the maturity of bond debt is also longer in firms in English common law countries compared to firms in civil law countries (8.19 years vs 4.34 years). Interestingly, however, the pattern is reverted for bank debt. That is, firms in English common law

[11] As before, we calculate the average of statistics across civil law origins by weighting origin-specific averages by number of firms in a given origin. For example, the average total debt maturity of 3.40 years is calculated as follows: $(319 \times 3.40 + 1920 \times 3.20 + 1077 \times 3.77) / (3316)$.

countries have a slightly shorter bank debt maturity compared to civil law countries (3.00 years vs 3.17 years), although the magnitude of such difference is small and not statistically significant. In the context of our findings from Section 3.2, we can therefore summarize that debt ownership concentration is negatively correlated with debt maturity. Our data indicates this relationship is robust no matter whether we focus on bank, arm's length, or total debt. This correlation supports the idea in Diamond (2004) that debt maturity and debt ownership dispersion are substitutes.

## 3.3 Debt Collateral Security

Figure 9 reports the distribution of the percentage of bank debt (Panel A), arm's length debt (Panel B), and total debt (Panel C) that is secured by some collateral, comparing firms in French civil law countries and firms in English common law countries. The Figure shows that a larger fraction of debt is secured by some collateral for firms in English common law countries relative to firms in French civil law countries, and this is true for both bank debt and arm's length debt.

Table 7 reports detailed statistics on the fraction of secured debt in individual countries and legal origins. Overall, about one third (32.31%) of total debt is secured by some form of collateral. Notably, the fraction of secured debt is much higher for English common law countries compared to civil law countries (35.16% vs 24.18%). That said, however, the fraction of secured debt for firms from Scandinavian legal origin is as high as the one across firms in English common law countries. Moreover, we examine the fraction of secured debt that is due to bank and arm's length debt, respectively. Perhaps not surprisingly, secured debt is mostly composed of secured bank debt as opposed to secured arm's length debt. This is true across all our sample countries. More interestingly, the composition of secured debt into bank and bond debt exhibits interesting cross-sectional variation. In fact, we find that the share of bond debt is significantly higher in firms in English common law countries compared to firms in civil law countries (11.08% vs 3.57%). The flip side of this statement implies

that the share of bank debt is lower in firms in English common law countries compared to firms in civil law countries (88.92% vs 96.43%). To sum up, we find that debt ownership concentration is negatively correlated with the fraction of secured debt.

### 3.4 Debt Currency

Figure 10 displays the distribution of debt currency, comparing firms in French civil law countries with firms in English common law countries. The Figure shows that firms in French civil law countries are much less likely to borrow in local currency and much more likely to borrow in USD-denominated debt as a foreign currency than firms in English common law countries.

Table 8 reports detailed statistics for firms' debt currency choices in individual countries and all legal origins. Overall, we find that firms operating in common law countries are more likely to issue debt in their local currency compared to firms in civil law countries. That is, while 89.93% of firm's debt in English common law countries is issued in local currency, this is the case for only 77.77% of firm's debt in civil law countries. On the other hand, firms in French civil law countries borrow 37.87% in USD denominated arm's length debt and 33.98% in USD denominated bank debt. These findings are consistent with the idea in Mellor et al. (2024) and Thiel (2000) that in international transactions contracting parties may attempt to mitigate an unfavorable institutional environment by borrowing in US dollars, which often comes with the protection of New York law and US courts.

## 4 Results

### 4.1 Legal Origin, Investor Protection, and Debt Structure

We examine the empirical patterns documented from Section 3 in a multivariate context at the firm level. That is, we run the following regression models

$$y_{i,j,c,t} = \beta_1 \times \mathbb{1}\text{French}_c + \beta_2 \times \mathbb{1}\text{German}_c + \beta_3 \times \mathbb{1}\text{Scandinavian}_c + \delta' \mathbf{X}_{i,j,c,t} + \eta_j + \eta_t + \varepsilon_{i,j,c,t}, \quad (7)$$

where $i$ indexes firms, $j$ industries, $c$ countries, and $t$ year-quarter, the independent variables $y$ are measures of ownership concentration, debt maturity, secured debt, or debt currency. Further, $\mathbb{1}$French, $\mathbb{1}$German, and $\mathbb{1}$Scandinavian are dummies which equal one if a firm belongs to the French, German, or Scandinavian legal origin, respectively. In addition, $\mathbf{X}$ denotes a vector of control variables including firms' assets and age, and GDP per capita. Finally, $\eta_j$ and $\eta_t$ denote industry and year-quarter fixed effects.

To explore how our results relate to country-specific measures of legal protection and, thus, exploit more granular variation, we rely on the anti-self-dealing index from Djankov et al. (2008b), $ASD$. The anti-self-dealing index measures the legal protection against expropriation by corporate insiders. The index is available for most of our sample countries and focuses on private enforcement mechanisms, such as disclosure, approval, and litigation, that govern a specific self-dealing transaction. The index exhibits substantial cross-sectional variation across our sample countries as can be seen from Appendix Table A2. On average, the index is higher for common law countries compared to civil law countries. That is, we also run the following regression models:

$$y_{i,j,c,t} = \beta \times ASD_c + \delta' \mathbf{X}_{i,j,c,t} + \eta_j + \eta_t + \varepsilon_{i,j,c,t}, \quad (8)$$

and

$$y_{i,j,c,t} = \beta \times ASD_c \times \text{size group}_{i,j,c,t} + \delta' \mathbf{X}_{i,j,c,t} + \eta_j + \eta_t + \varepsilon_{i,j,c,t}, \quad (9)$$

where *size group* denotes four groups formed based on the quartiles of firm size within a country, with firm size measured as total assets in US Dollars. The size quartiles serve two important purposes: First, they categorize firms into size groups within the population,

rather than in our final sample[12]. This ensures that even if the final sample is skewed towards larger firms due to data availability, we can still mitigate concerns about a potential bias by studying different segments of the true spectrum of firms in the economy.

Second, the interaction between legal protection and firm size allows us to explore the heterogeneous effects of investor protection across different size groups. This choice is further motivated by the observation that many of the largest firms are international, and for these firms, it is often possible to access the protection of New York law and of US courts, almost irrespective of where they are located.

### 4.1.1 Debt Ownership Concentration

Table 9 reports the regression results when we use the number of creditors, bondholders, banks, and lead arrangers as independent variables. Even when controlling for size, age, GDP per capita and fixed effects, we find that total debt ownership in civil law countries is more concentrated compared to English common law countries. That is, the point estimates for all three dummy variables are negative and, for French and Scandinavian legal origins, highly statistically significant. The same findings are true when we exclusively focus on arm's length debt. That is, the number of total creditors and arm's length creditors are significantly lower for civil law countries. In contrast, in the case of bank debt we find that both the number of banks as well as the number of lead arrangers are higher in civil law countries. That is, bank debt ownership is less concentrated in civil law countries. Overall, our regression results are entirely consistent with the unconditional sample averages presented in Section 3.2. Therefore, our results are unlikely driven by individual outliers in our sample.

Importantly, our results also hold when we allow for more granular variation in the variable that relates to legal system of our sample countries. In fact, the interpretation of the results is qualitatively the same when we employ the anti-self-dealing index from Djankov et al.

[12]The first time in our data preparation when we have firm size is after we merge the data in Capital IQ with our balance sheet information in Compustat, Worldscope, and Amadeus. This is the point where we form the size quartiles.

(2008b) and run the regression models from equations (8) and (4.1). That is, the regression coefficient of the anti-self-dealing index is positive for the number of total debt and arm's length debt creditors but negative for the number of banks and lead arrangers. The lack of statistical significance in these coefficients hints to the possibility that the relationship between legal environment and debt ownership concentration might not be equally strong for all firms within a certain country. For example, one would expect country-specific legal protection for creditors to matter more for smaller, locally active firms and less so for large, international firms which have access to international credit markets. Columns (9) and (10) of Table 9 confirm this conjecture in the data. That is, we find a highly statistically significant and positive relationship between the anti-self-dealing index and the number of total debt or bond creditors for all firms except the very large firms, i.e., firms in the highest quartile of the country-specific size distribution in the population. In terms of economic significance, a one standard deviation increase in the anti-self-dealing index corresponds to an increase of 118.5, 57.6, 18.9 in the number of creditors, respectively for small, medium, and large firms. This effect is economically large given the unconditional sample average of about 136 creditors. The effect on very large firms is negligible. Moreover, we see the monotonically decreasing point estimates of the $ASD$-coefficient from the smallest to largest size group as further confirmation of our prior. Notably, the pattern changes in columns (11) and (12) of Table 9 for the number of banks and lead arrangers.

In Table 10 we repeat the analysis from Table 9 for an alternative measure of debt ownership concentration, namely the number of creditors required to cross an ownership threshold of 30%.[13] All our findings are robust to this alternative specification. Overall, debt ownership concentration is positively correlated with legal protection. Further, this positive relationship is strongest for small firms and gets gradually weaker with firm size. That is, a one standard deviation increase in the anti-self-dealing index corresponds to an increase of about 0.5 to 1 in the number of creditors required to cross 30% of ownership. This is an

[13]Note that all results remain qualitatively similar when we use the number of creditors required to cross an ownership threshold of 10% or 20%, respectively.

economically significant increase given that the unconditional average is about 4. For further robustness, Appendix Tables A3 and A4 tabulate regression results for the two remaining measures of debt ownership concentration, namely the cumulative ownership measure, $C10$, and HHI. Again, all our results are robust to these alternative specifications.

### 4.1.2 Discussion of Debt Ownership Concentration Results

Our results accord well with the empirical predictions of the theoretical model of Gennaioli and Rossi (2013), who predict that the "dispersion of noncontrolling creditors should be observed at relatively high levels of investor protection" (p. 604). This prediction is the opposite of the traditional idea that debt dispersion makes lenders tough following a strategic default (Bolton and Scharfstein (1996)), implying that firms should borrow from more lenders when enforcement cost is higher (Diamond (2004)). It is useful to discuss briefly here the sources of these different theoretical predictions (the reader can of course always read the original contributions).

Gennaioli and Rossi (2013) study theoretically the optimal debt structure to resolve financial distress, and outline under which conditions such debt structure yields an efficient resolution of financial distress. Their model is in the tradition of Aghion and Bolton (1992) and Hart and Moore (1998), in that debt contracts can allocate control rights over the reorganization versus liquidation decision, and cash flows are less pledgeable than liquidation proceeds. Unlike Aghion and Bolton (1992) and Hart and Moore (1998), Gennaioli and Rossi (2013) allow for multiple creditors.

Gennaioli and Rossi (2013) find that the optimal debt structure consists of two classes of creditors. One class is concentrated on a large creditor (a 'bank') who has exclusive control over the liquidation versus reorganization decision. This creditor is given both physical collateral and an equity stake in the reorganized firm. Crucially, this equity claim is undercollateralized, in the sense that it pledges a share of physical assets that is smaller than the creditor's equity stake. The other debt class is dispersed among small, atomistic creditors

who have no control rights. These creditors are entitled to obtain some liquidation proceeds but are 'wiped out' in reorganization.

The logic of this debt structure is insightful. Giving the large creditor equity in the reorganized firm removes the creditor's liquidation bias. In addition, under-collateralization makes him fully internalize the upside of reorganization. Under-collateralization, the novel feature of Gennaioli and Rossi (2013), works best in the presence of a second debt class: distributing the remaining liquidation proceeds to a debt class without control rights, as opposed to 'leaving them on the table,' maximizes total repayment to all creditors. The debt class of non-controlling creditors should then be dispersed to prevent collusion, which would reintroduce a liquidation bias. The presence of two debt classes differing in their control rights rationalizes the coexistence of 'bank' and 'arm's-length' debt in a firm's debt structure. As a result, Gennaioli and Rossi (2013) predict that debt ownership dispersion should increase with investor protection, and in particular "The notion of investor protection relevant for this prediction is broader than that of creditor rights and includes shareholder protection against managerial self-dealing and tunneling" (Gennaioli and Rossi (2013), p.624).

This notion differs from the traditional idea that debt dispersion makes lenders tough following a strategic default, e.g., Bolton and Scharfstein (1996), and Diamond (2004), and as a result one should expect firms to borrow from more creditors when the institutional environment is weaker. The key driver of the different predictions is that, unlike Gennaioli and Rossi (2013), neither Bolton and Scharfstein (1996) nor Diamond (2004) study the allocation of control rights over the liquidation decision.

### 4.1.3 Debt Security

Next, we examine how creditor protection correlates with the firms' choice to issue debt secured by collateral rather than unsecured debt. To do so, we rely on the creditor rights index from Djankov et al. (2007) rather than the anti-self-dealing index used before in regression specifications otherwise similar to equations 8 and 4.1. In fact, the creditor rights index

measures directly the rights of secured creditors in bankruptcy, and it is therefore more appropriate to examine cross-country variation in secured debt.

Table 11 reports regression results when we use a firm's fraction of secured debt as an independent variable. Two main findings emerge. First, firms operating in civil law countries are significantly less likely to issue secured debt compared to common law country firms. This finding is consistently true for total debt, arm's length debt, and bank debt. Perhaps not surprisingly, the results are weakest for bond debt which rarely happens to be secured by collateral, as can be seen from Table 7. Consistent with these findings, we estimate a highly statistically significant positive association between the creditor rights index and the tendency to issue secured debt.

Second, our results show that the strong and positive association is entirely due to the large and very large firms in our sample. In fact, the association between creditor rights and issuance of secured debt is even negative for firms in the smallest size group. That is, while creditor rights and secured debt seem to be substitutes for small firms, they appear to be complements for large firms. Our estimates are economically meaningful. For example, for total debt, a one standard deviation increase in the creditor rights index corresponds to a 4.98 percentage point increase in the fraction of secured debt. At the unconditional sample average, this implies an increase of about 16% in the fraction of secured debt.

#### 4.1.4 Debt Maturity and Currency

Table 12 reports the regression results for debt maturity. Overall, the reported results suggest that better legal protection results in longer maturity for arm's length debt. That is, firms in civil law countries tend to issue debt with shorter maturity compared to firms in common law countries. As usual, bank debt behaves differently to bond debt. Therefore, bank debt maturity is longer in countries that have lower legal protection as measured by the anti-self-dealing index from Djankov et al. (2008b). In terms of economic significance, a one standard deviation increase in the anti-self-dealing index corresponds to an increase of 1.06, 0.64, 0.42,

and 0.36 years in the maturity of arm's length debt, respectively for small, medium, large, and very large firms. Yet, these effects are partly offset by the simultaneous decrease in the maturity of bank debt, such that the maturity of total debt is only significantly positively correlated with legal protection for small-to-medium-size firms.

In Table 13 we explore the relationship between legal creditor protection and firms' debt currency choice. Overall, the regression results suggest that civil compared to common law countries issue to lesser (higher) extent debt denominated in the local currency (in US Dollars). Moreover, the signs of our coefficient estimates of the anti-self-dealing index indicate that small firms operating in low creditor protection countries are more likely to issue debt denominated in US Dollars rather than in their local currency. This pattern suggests that issuing US Dollar denominated debt is a (imperfect) substitute for legal creditor protection. While our data is too noisy to recover precise statistically significant estimates, the sign and relative size of the coefficient estimates are in line with our interpretation of the data.

Overall, our results indicate that two ways by which firms try to mitigate a weak legal protection is by issuing debt with a short time to maturity and denominated in US Dollars. These results are in line with the prediction by Diamond (2004) that debt maturity should negatively correlate with enforcement costs, and with the general idea that USD denominated debt may come with the protection of New York law and of US courts, e.g., see Hébert and Schreger (2017) and Mellor et al. (2024). Therefore, our results point to a trade-off between debt ownership concentration on the one hand, and debt maturity and US dollar denomination of debt contracts on the other hand.

# 5 Conclusion

Combining different datasets for the first time and conducting manual checks for thousands of firms, we construct a new data set on corporate debt structures around the world. Our database pieces together the debt structure of 10,136 public and private firms from 52 coun-

tries between 2002 and 2021, comprising 124,101 corporate bond issues held by 63,323 bondholders and 85,817 bank loans and credit lines extended by 10,154 banks.

There are three main parts of our analysis. First, we provide an anatomy of corporate debt structure around the world. Corporate leverage is remarkably similar across the world at about one third of the firm's assets. Bank loans are the most common form of debt financing, followed by arm's length debt and credit lines, but there is a lot of heterogeneity.

Second, we examine the association between debt structure (and debt ownership concentration) and legal origin. Total debt ownership is most concentrated in civil law countries, and most dispersed in common law countries. This is a novel result in the literature. There is considerable heterogeneity: In common law countries the debt structure features dispersed debt ownership, with dispersed arm's length borrowing coexisting with concentrated and secured bank borrowing. In civil law countries firms mitigate the unfavorable institutional environment by borrowing from more banks (but far fewer arm's length creditors), at shorter maturity, and by borrowing in USD-denominated (foreign) debt. These patterns are strongest for small-to-medium size firms, whereas the largest firms are able to achieve dispersed debt ownership by international investors (and the protection of US courts) almost irrespective of their country of incorporation.

Third, we associate corporate debt structure with institutional characteristics related to legal origin. We find that provisions that protect small outside investors from the self-dealing activities of managers or dominant insiders are significant correlates of corporate debt structure. Stronger protection against self-dealing correlates with higher total debt dispersion, and with higher dispersion in arm's length debt ownership. This pattern holds for all but the largest firms. By contrast, for all firms, and particularly for the larger ones, better anti-self-dealing provisions correlate with lower bank ownership dispersion. Stronger protection against self-dealing also correlates with longer maturity of arm's length debt. The effect is largest for the smallest firms, declines monotonically with firm size, and remains strongly significant for all but the largest firms. We also find that rights of secured creditors in

bankruptcy are significant correlates of the likelihood of debt being secured by collateral. The stronger the creditor rights, the larger the likelihood that total debt is secured by collateral. This result is entirely driven by bank debt.

These results support the key insights of the law and finance literature. Consistent with La Porta et al. (1998) and La Porta et al. (2008), we find that debt ownership dispersion is largest in countries with better investor protection. In particular, our results are consistent with Gennaioli and Rossi (2013), who rationalize the coexistence of concentrated bank debt and dispersed arm's length debt in the firm's debt structure, and predict that dispersion of total debt and arm's length debt should increase with investor protection. Our results on debt maturity are consistent with the prediction of Diamond (2004) that firms in poor investor protection countries should mitigate the unfavorable institutional environment by borrowing more short term. Overall, our results highlight the substitutability of debt ownership concentration with debt maturity and currency. In better institutional environments, firms are more likely to borrow from many dispersed creditors at longer maturities and in local currencies, whereas in worse institutional environments firms are more likely to borrow from fewer creditors at shorter maturities and in USD denominated debt contracts.

We view this paper as a first step in reassessing fundamental questions in corporate finance, related to the determinants and consequences of corporate debt structure. Our analysis abstracts from the exact role of banks and bondholders on how to resolve financial distress, on how to renegotiate or restructure debt, on whether to liquidate corporate assets and how to allocate the proceeds, in or outside of formal bankruptcy proceedings. Banks and bondholders might be relatively passive or play a more active role, on their own or in coalition with others. Future work should examine in detail the mechanics of resolving financial distress when the corporate debt structure comprises many heterogeneous creditors in a number of separate debt classes, and should examine in detail the international dimension of corporate debt structure and the resolution of financial distress.

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# 6 Figures

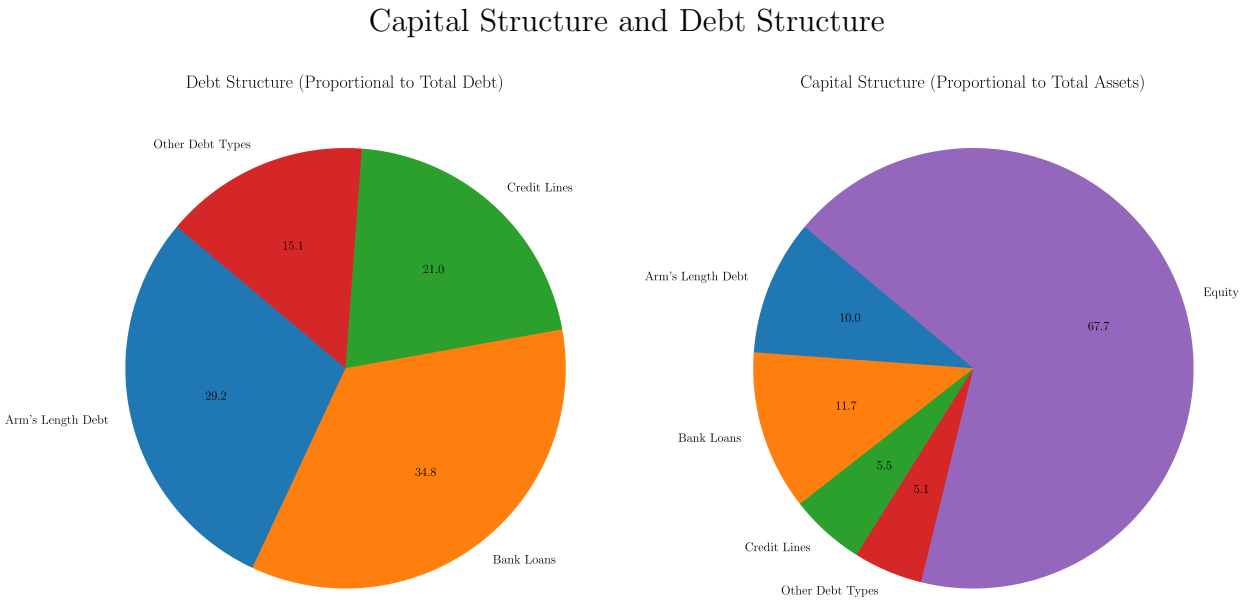



Figure 1: This figure shows the global average capital structure and debt structure, including the composition of various debt types. The debt categories comprise arms-length debt, bank loans, credit lines, and other forms of debt. Detailed variable definitions and sources can be found in Appendix Section A.1. Averages are computed over all years in the sampleand missing data are disregarded in calculating the averages.

Evolution of Book Leverage and Debt Composition Over Years

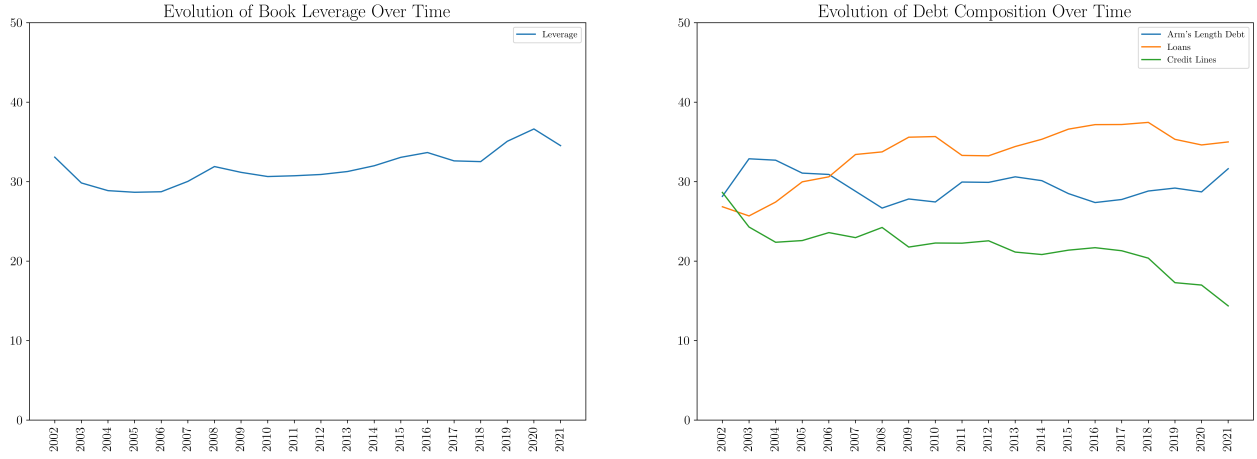



Figure 2: This figure displays the global evolution of book leverage and debt composition over years. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

World Map with Legal Origins and the Percentage of Bank Debt and Arm's Length Debt

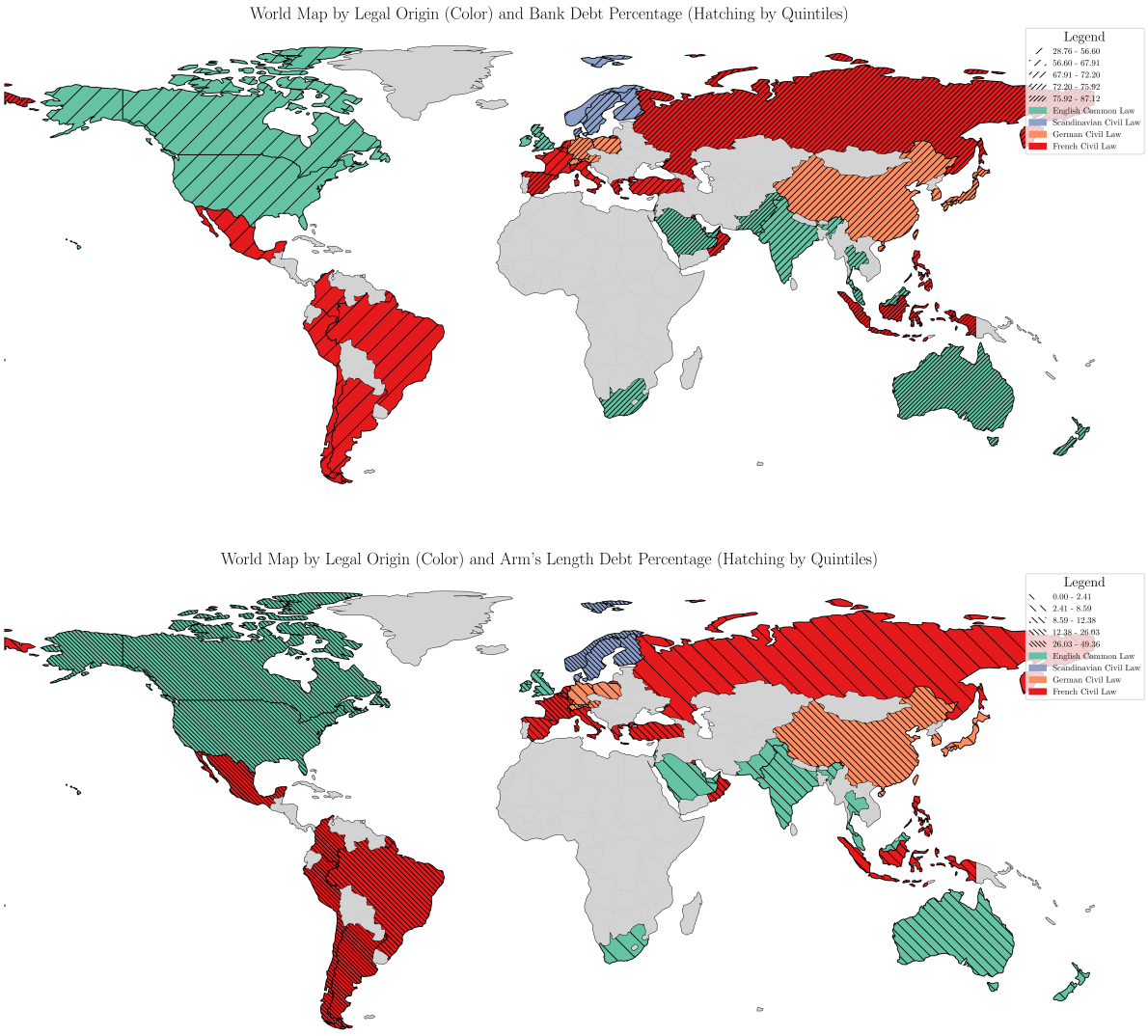



Figure 3: This figure presents a world map illustrating legal origins by color and the composition of debt across countries in our sample. The intensity of hatching corresponds to quintiles of debt types, expressed as percentages of total debt. These debt types include the outstanding amounts of arms-length debt (based on instruments included in our sample) and bank debt (based on loans and credit lines included in our sample). Detailed variable definitions and sources can be found in Appendix Section A.1. Country-level averages are calculated over all years in the sample and missing data are disregarded in calculating the averages.

Distribution of Number of Creditors in French Civil Law vs. Common Law

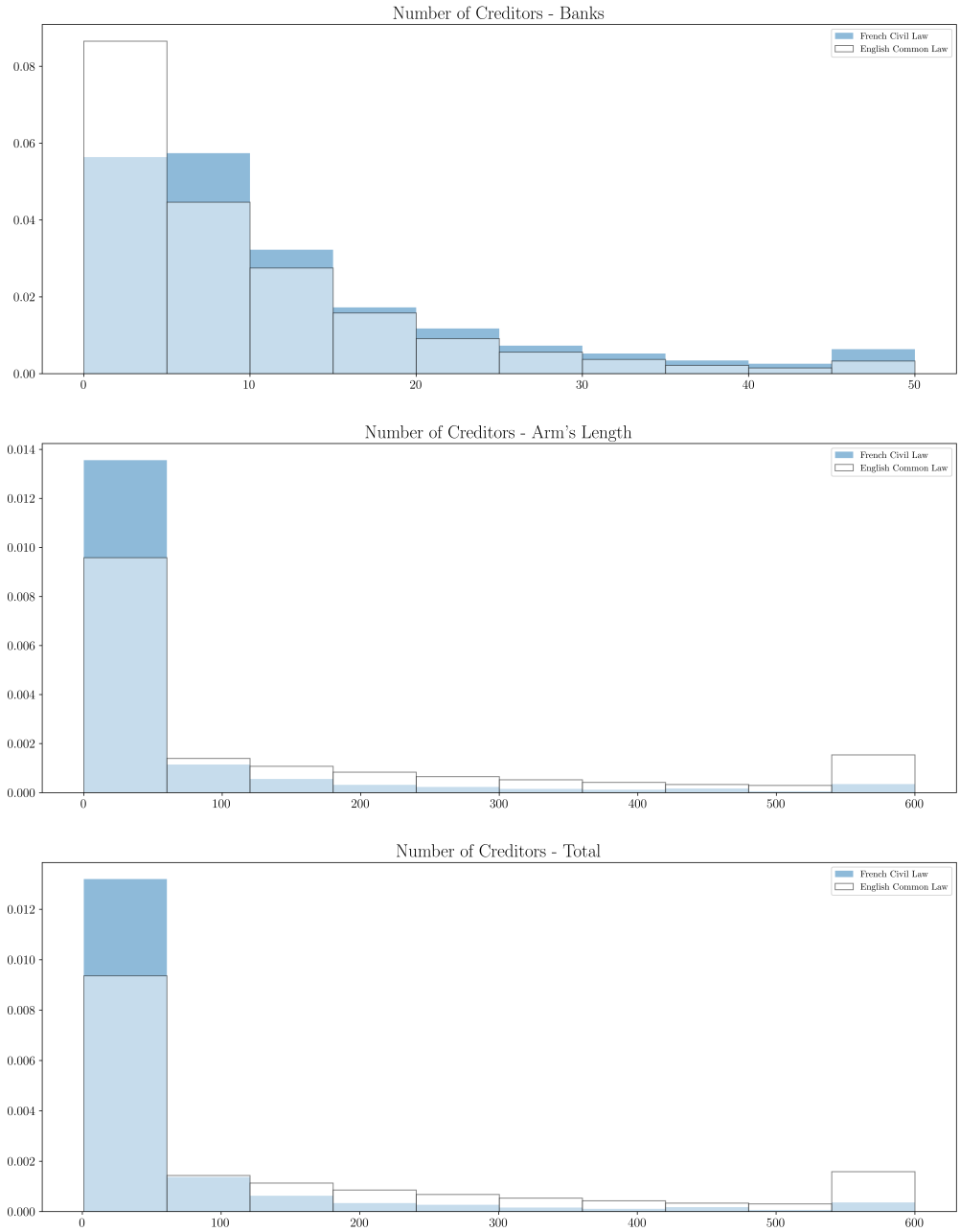



Figure 4: This figure displays the distribution of number of creditors, separately for bank debt, arms length debt, and total debt, comparing French Civil Law countries and English Common Law countries. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

Distribution of C5 in French Civil Law vs. Common Law

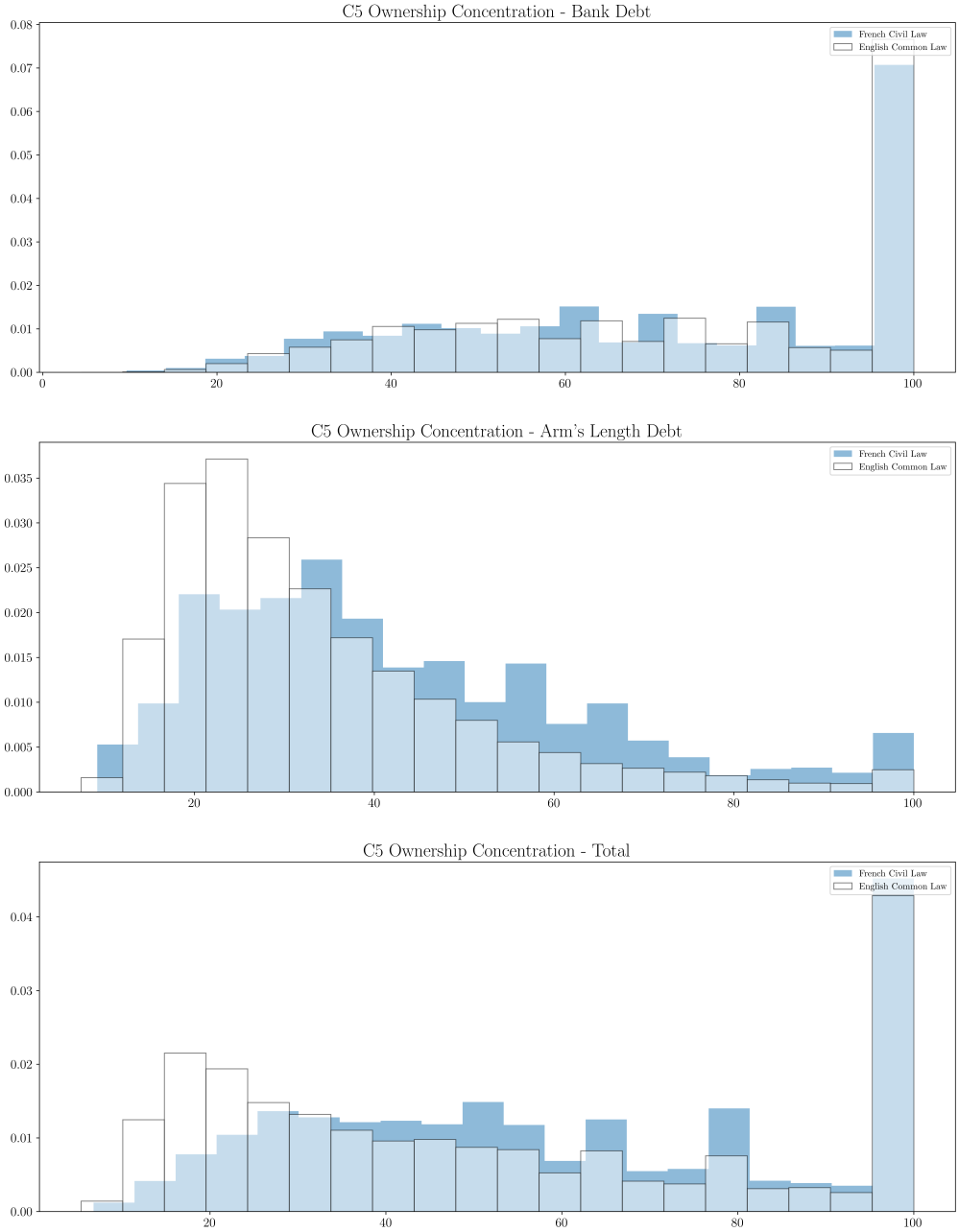



Figure 5: This figure displays the distribution of C5, separately for bank debt, arms length debt, and total debt, comparing French Civil Law countries and English Common Law countries. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

Distribution of NtC 30% of Credit (Types) in French Civil Law vs. Common Law

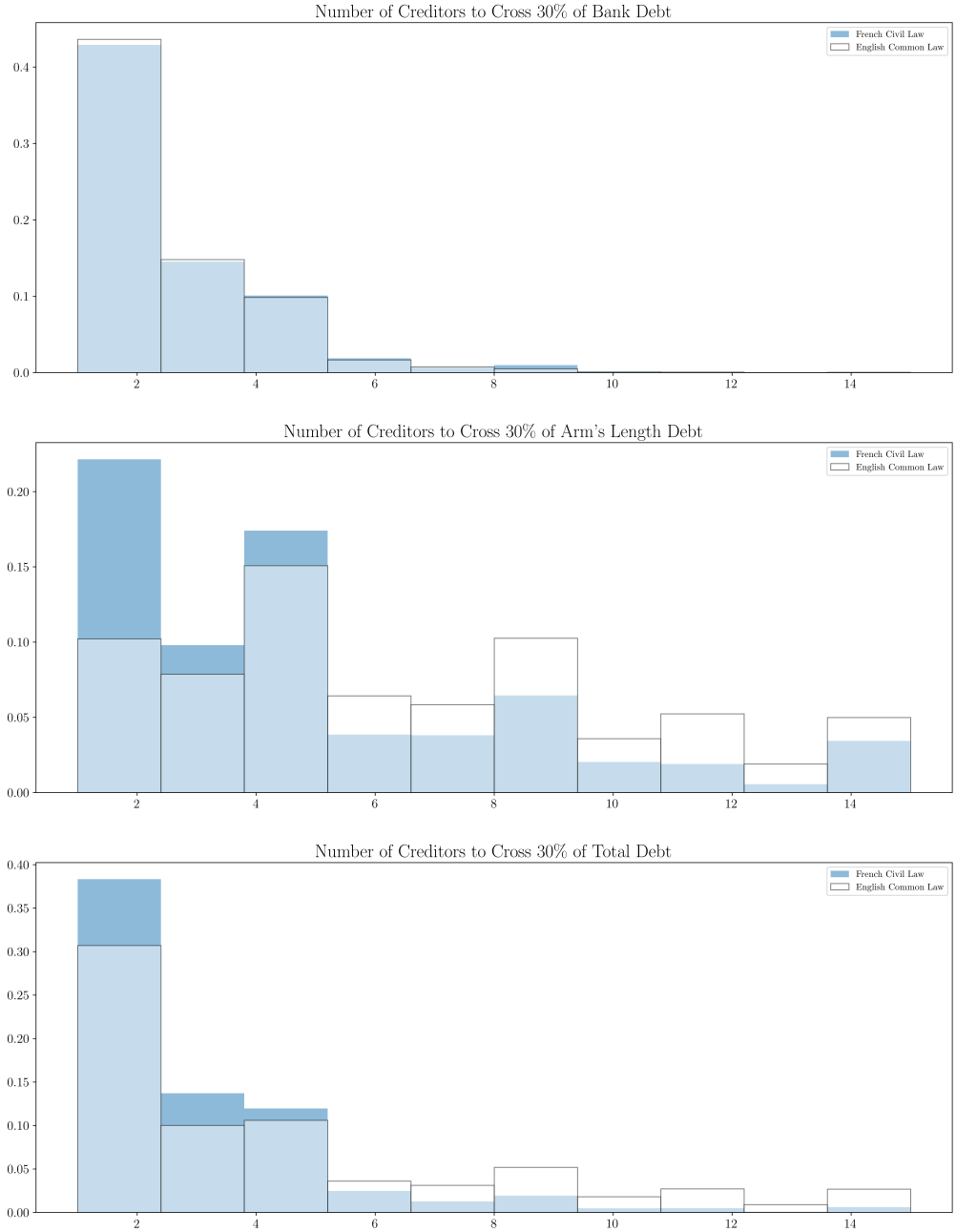



Figure 6: This figure displays the distribution of number of creditors to cross 30% of debt, separately for bank debt, arms length debt, and total debt, comparing French Civil Law countries and English Common Law countries. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

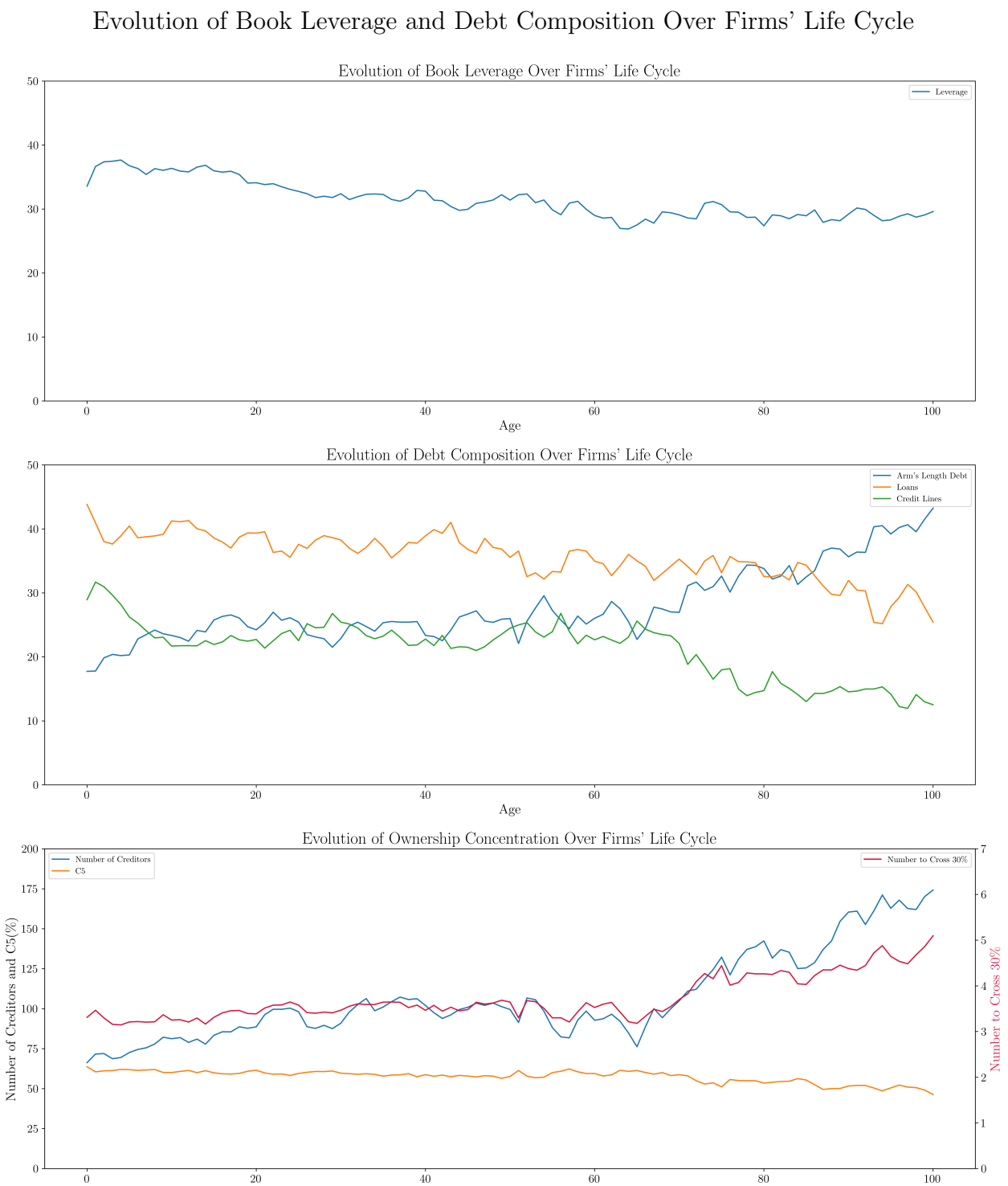



Figure 7: This figure displays the global evolution of book leverage, debt composition, and debt ownership concentration over firms' life cycle. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

Distribution of Maturity in French Civil Law vs. Common Law

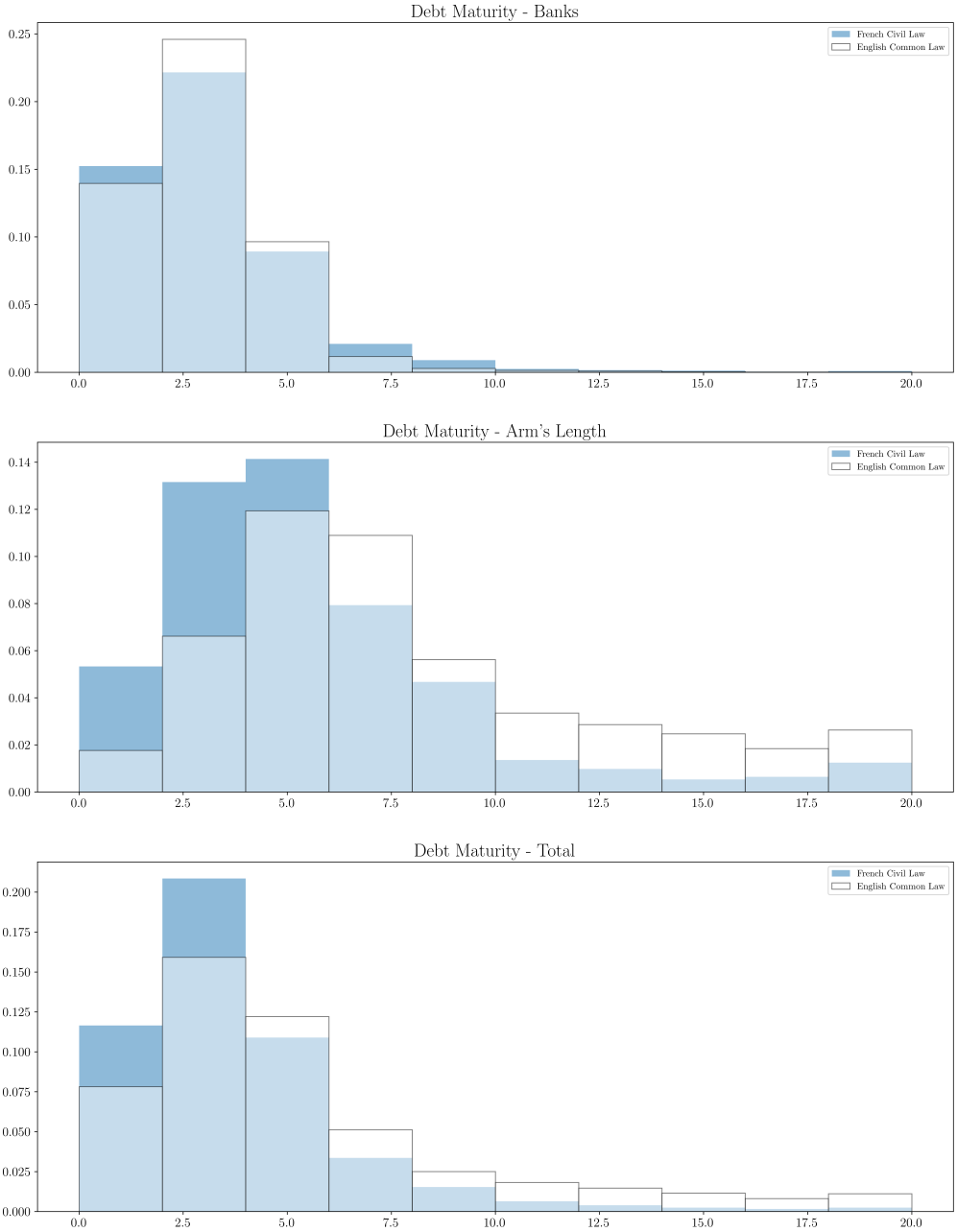



Figure 8: This figure displays the distribution of debt maturity, separately for bank debt, arms length debt, and total debt, comparing French Civil Law countries and English Common Law countries. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

Distribution of Percentage of Secured Debt in French Civil Law vs. Common Law

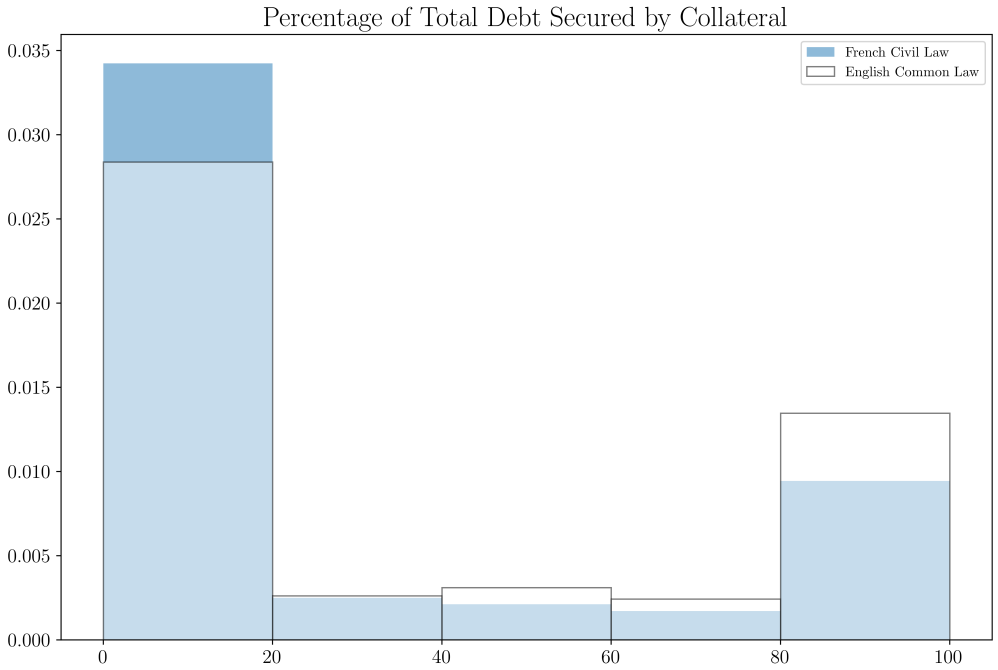



Figure 9: This figure displays the distribution of percentage of total debt that is secured by some collateral, comparing French Civil Law countries and English Common Law countries. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

Distribution of Debt Currency in French Civil Law vs. Common Law

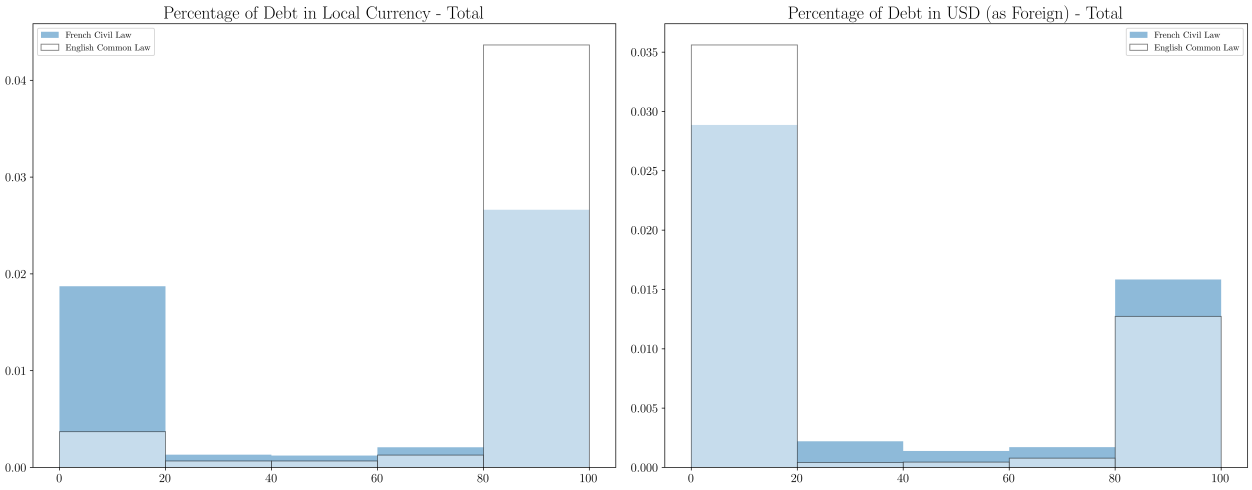



Figure 10: This figure displays the distribution of debt currency, comparing French Civil Law countries and English Common Law countries. Detailed variable definitions and data sources are provided in Appendix Section A.1. Averages are calculated over all years in the sample, and missing data are disregarded in calculating the averages.

# 7 Tables

Table 1: Sample Construction

| Sample | Legal Origin | Num Countries | Num Firms | Num Firms % | Num Public Firms | Num Zero Leverage Firms | Num Firm Quarters | Leverage | Arm's Length Debt % | Loans % | Lines % | Other Debt Types % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIQ | All | 184 | 135807 | 100.0 | 57940 | 751 | 3563609 | | 21.5 | 46.6 | 13.0 | 19.1 |
| CIQ | English Common Law | 39 | 75655 | 55.7 | 32525 | 623 | 1798396 | | 26.6 | 35.5 | 15.5 | 22.4 |
| CIQ | Scandinavian Civil Law | 4 | 3731 | 2.7 | 1591 | 11 | 106464 | | 25.2 | 44.6 | 8.9 | 21.4 |
| CIQ | German Civil Law | 20 | 38182 | 28.1 | 17126 | 82 | 1105415 | | 13.2 | 61.7 | 10.1 | 15.1 |
| CIQ | French Civil Law | 58 | 16965 | 12.5 | 6180 | 26 | 518301 | | 22.5 | 49.0 | 12.2 | 16.5 |
| CIQ | Other | 63 | 1274 | 0.9 | 518 | 9 | 35033 | | 16.1 | 52.4 | 12.4 | 19.3 |
| CIQ & BS | All | 145 | 85576 | 100.0 | 52063 | 254 | 2422026 | 0.25 | 17.1 | 50.5 | 15.2 | 17.6 |
| CIQ & BS | English Common Law | 35 | 47920 | 56.0 | 27516 | 192 | 1244098 | 0.26 | 22.9 | 37.8 | 18.2 | 21.2 |
| CIQ & BS | Scandinavian Civil Law | 4 | 2678 | 3.1 | 1563 | 6 | 78040 | 0.25 | 16.6 | 52.7 | 10.3 | 21.0 |
| CIQ & BS | German Civil Law | 20 | 23150 | 27.1 | 16541 | 46 | 729402 | 0.23 | 10.4 | 65.0 | 11.4 | 13.5 |
| CIQ & BS | French Civil Law | 54 | 11159 | 13.0 | 6012 | 9 | 349096 | 0.27 | 14.7 | 56.6 | 15.1 | 14.5 |
| CIQ & BS | Other | 38 | 739 | 0.9 | 469 | 1 | 21390 | 0.25 | 13.5 | 52.9 | 14.3 | 19.5 |
| CIQ & BS & Ownerships | All | 108 | 18104 | 100.0 | 10379 | 0 | 388839 | 0.35 | 37.9 | 38.5 | 14.0 | 9.7 |
| CIQ & BS & Ownerships | English Common Law | 34 | 10340 | 57.1 | 4954 | 0 | 215968 | 0.35 | 45.2 | 27.2 | 18.2 | 9.5 |
| CIQ & BS & Ownerships | Scandinavian Civil Law | 4 | 630 | 3.5 | 388 | 0 | 14451 | 0.36 | 44.6 | 33.7 | 7.9 | 13.8 |
| CIQ & BS & Ownerships | German Civil Law | 17 | 4718 | 26.1 | 3587 | 0 | 103190 | 0.33 | 22.2 | 61.2 | 8.5 | 8.1 |
| CIQ & BS & Ownerships | French Civil Law | 36 | 2309 | 12.8 | 1387 | 0 | 53196 | 0.36 | 35.9 | 42.9 | 8.7 | 12.8 |
| CIQ & BS & Ownerships | Other | 17 | 107 | 0.6 | 63 | 0 | 2034 | 0.37 | 28.6 | 51.4 | 9.0 | 10.9 |
| Final Sample | All | 52 | 10136 | 100.0 | 5522 | 0 | 127179 | 0.32 | 33.9 | 39.1 | 22.1 | 5.0 |
| Final Sample | English Common Law | 21 | 6820 | 67.3 | 3217 | 0 | 94684 | 0.33 | 41.1 | 28.9 | 24.7 | 5.3 |
| Final Sample | Scandinavian Civil Law | 4 | 319 | 3.1 | 208 | 0 | 3020 | 0.35 | 26.2 | 49.0 | 18.2 | 7.0 |
| Final Sample | German Civil Law | 8 | 1920 | 18.9 | 1476 | 0 | 20324 | 0.28 | 7.7 | 74.2 | 14.9 | 3.3 |
| Final Sample | French Civil Law | 19 | 1077 | 10.6 | 621 | 0 | 9151 | 0.35 | 19.9 | 62.5 | 12.4 | 5.7 |
| Final Sample | Other | 0 | 0 | 0.0 | 0 | 0 | 0 | | | | | |

The table provides an overview of our sample at various stages of data preparation. The initial stage involves Capital IQ, which we subsequently merge with balance sheet data data from Worldscope, Compustat, and Amadeus, referred to as "CIQ & BS" in the table. This dataset serves as the population for us. Following this, we integrate the merged dataset with debt ownership data from eMAXX and Dealscan, labeled as "CIQ & BS & Ownerships". From this penultimate sample, we exclude observations where debt ownership observed is less than 30% of the firms balance sheet total debt, and we further exclude observations from countries with fewer than ten distinct firms to arrive at our final sample. Countries with unknown legal origin or those marked as "Socialist" according to Djankov et al. (2007) are categorized as "Other". The columns represent the legal origin, number of countries, number of firms, percentage of firms in each legal origin, number of public firms, number of firms that never had debt, and leverage (total assets/total debt). The subsequent four columns detail outstanding amounts of Arm's length debt (including bonds and commercial papers), term loans, drawn lines of credit, and other types of debt as per Capital IQ.

Table 2: Summary Statistics

| Country | Num Firms | Num Firm Quarters | % of Public Firms | Total Assets USD (m) | Total Debt USD (m) | Leverage | Arm's length Debt Observed % | Loans Observed % | Lines Observed % | Identified Instruments % | Total Debt Ownership Observed % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 278 | 1557 | 56.65 | 2,592.39 | 653.70 | 27.46 | 4.47 | 33.79 | 46.19 | 84.45 | 81.74 |
| Bermuda | 55 | 778 | 68.12 | 7,454.64 | 1,636.46 | 32.30 | 26.08 | 40.27 | 14.57 | 80.92 | 70.57 |
| Canada | 577 | 8200 | 64.76 | 4,798.94 | 1,377.12 | 30.33 | 30.88 | 18.20 | 37.40 | 86.48 | 71.91 |
| Cayman Islands | 12 | 193 | 58.55 | 1,835.67 | 517.37 | 27.18 | 16.61 | 42.06 | 28.05 | 86.71 | 79.41 |
| Guernsey | 11 | 66 | 19.70 | 1,609.18 | 635.08 | 36.32 | 15.23 | 47.93 | 17.30 | 80.46 | 70.56 |
| Hong Kong | 194 | 1237 | 75.59 | 4,172.63 | 743.31 | 24.34 | 6.59 | 70.17 | 3.77 | 80.53 | 75.76 |
| India | 202 | 853 | 83.47 | 4,312.84 | 1,473.40 | 43.52 | 3.60 | 67.05 | 2.94 | 73.59 | 71.40 |
| Ireland | 55 | 587 | 65.25 | 9,562.39 | 2,953.42 | 31.72 | 25.81 | 32.01 | 24.13 | 81.95 | 71.18 |
| Israel | 14 | 68 | 86.76 | 2,572.92 | 1,076.65 | 38.19 | 6.07 | 62.65 | 13.03 | 81.75 | 76.81 |
| Jersey | 10 | 59 | 18.64 | 3,251.63 | 582.84 | 26.46 | 26.11 | 18.57 | 44.67 | 89.35 | 75.00 |
| Malaysia | 56 | 388 | 75.77 | 1,632.88 | 570.56 | 28.95 | 0.75 | 63.94 | 15.21 | 79.89 | 79.29 |
| New Zealand | 41 | 273 | 53.85 | 993.11 | 243.41 | 26.14 | 1.15 | 25.38 | 61.74 | 88.27 | 87.47 |
| Pakistan | 16 | 196 | 91.33 | 767.02 | 138.25 | 27.18 | 0.00 | 78.82 | 0.00 | 78.82 | 78.82 |
| Qatar | 12 | 44 | 97.73 | 5,813.67 | 1,397.85 | 26.07 | 0.91 | 67.07 | 3.95 | 71.93 | 71.05 |
| Saudi Arabia | 35 | 525 | 96.57 | 7,569.39 | 3,130.48 | 40.47 | 0.59 | 78.60 | 1.01 | 80.19 | 79.62 |
| Singapore | 108 | 942 | 43.10 | 2,349.95 | 642.10 | 29.24 | 8.80 | 66.53 | 4.16 | 79.49 | 74.15 |
| South Africa | 32 | 168 | 83.93 | 3,914.85 | 1,072.61 | 24.30 | 1.97 | 50.74 | 24.16 | 76.88 | 75.13 |
| Thailand | 51 | 432 | 80.79 | 1,244.22 | 495.78 | 37.91 | 2.12 | 75.11 | 0.37 | 77.60 | 75.77 |
| United Arab Emirates | 33 | 370 | 75.41 | 6,079.63 | 1,181.99 | 26.81 | 7.74 | 75.38 | 1.39 | 84.52 | 78.49 |
| United Kingdom | 579 | 4347 | 50.59 | 4,967.38 | 962.29 | 28.99 | 10.90 | 34.68 | 41.05 | 86.63 | 80.12 |
| United States | 4449 | 73401 | 56.68 | 8,077.90 | 2,263.36 | 33.57 | 41.69 | 23.62 | 22.27 | 87.57 | 71.45 |
| **English Common Law** | **6820** | **94684** | **58.19** | **7,286.66** | **2,022.68** | **32.83** | **36.26** | **26.61** | **23.93** | **86.81** | **72.35** |
| Denmark | 31 | 224 | 65.18 | 5,753.88 | 1,214.20 | 27.44 | 8.89 | 55.55 | 20.41 | 84.85 | 78.77 |
| Finland | 59 | 576 | 60.59 | 3,881.11 | 1,029.62 | 33.90 | 17.99 | 54.16 | 6.96 | 79.11 | 64.13 |
| Norway | 131 | 1334 | 76.39 | 2,227.01 | 662.81 | 37.93 | 31.66 | 35.18 | 16.55 | 83.38 | 65.57 |
| Sweden | 98 | 886 | 74.72 | 2,943.71 | 838.11 | 33.78 | 13.94 | 44.77 | 23.46 | 82.17 | 74.10 |
| **Scandinavian Civil Law** | **319** | **3020** | **72.05** | **3,014.35** | **825.10** | **35.17** | **22.16** | **43.12** | **17.03** | **82.32** | **68.78** |
| Austria | 22 | 180 | 90.00 | 5,019.25 | 1,439.35 | 29.79 | 18.56 | 35.66 | 23.14 | 77.37 | 61.06 |
| China | 140 | 889 | 89.20 | 3,670.39 | 771.10 | 26.59 | 11.07 | 69.56 | 1.18 | 81.81 | 74.59 |
| Germany | 209 | 1963 | 78.76 | 4,157.44 | 1,318.02 | 31.64 | 7.96 | 56.69 | 16.48 | 81.13 | 74.98 |
| Japan | 997 | 10990 | 84.20 | 2,287.67 | 602.56 | 25.65 | 1.68 | 65.74 | 10.64 | 78.07 | 76.66 |
| Poland | 31 | 305 | 59.67 | 3,144.47 | 713.42 | 29.11 | 8.45 | 51.03 | 18.94 | 78.42 | 73.49 |
| South Korea | 41 | 220 | 93.64 | 4,012.44 | 1,304.75 | 31.87 | 7.44 | 63.50 | 5.51 | 76.45 | 72.22 |
| Switzerland | 68 | 353 | 70.82 | 4,181.25 | 1,328.50 | 28.30 | 9.79 | 41.22 | 26.64 | 77.64 | 70.34 |
| Taiwan | 412 | 5424 | 88.57 | 1,116.89 | 360.40 | 32.46 | 1.20 | 60.13 | 16.31 | 77.64 | 76.57 |
| **German Civil Law** | **1920** | **20324** | **84.61** | **2,304.90** | **643.69** | **28.29** | **3.03** | **62.60** | **12.76** | **78.39** | **76.04** |
| Argentina | 19 | 158 | 92.41 | 2,031.68 | 410.68 | 23.49 | 33.15 | 52.36 | 0.00 | 85.52 | 65.90 |
| Belgium | 40 | 316 | 61.71 | 4,156.26 | 1,390.78 | 32.37 | 18.16 | 47.31 | 15.97 | 81.44 | 68.70 |
| Brazil | 41 | 201 | 60.20 | 2,928.90 | 857.41 | 30.52 | 18.38 | 51.78 | 2.24 | 72.41 | 61.55 |
| Chile | 25 | 203 | 96.55 | 4,868.53 | 1,460.57 | 29.29 | 32.24 | 43.46 | 0.00 | 75.70 | 58.70 |
| Colombia | 10 | 76 | 98.68 | 11,538.62 | 3,347.42 | 40.59 | 49.36 | 28.51 | 0.26 | 78.12 | 52.60 |
| France | 270 | 1828 | 53.99 | 5,900.08 | 1,767.98 | 32.22 | 15.62 | 49.12 | 16.53 | 81.27 | 70.90 |
| Greece | 48 | 280 | 54.64 | 1,489.66 | 725.13 | 48.43 | 4.16 | 63.31 | 10.94 | 78.41 | 75.88 |
| Indonesia | 63 | 781 | 96.54 | 1,200.38 | 421.38 | 36.77 | 5.96 | 62.17 | 14.34 | 82.47 | 78.82 |
| Italy | 127 | 1048 | 55.44 | 4,020.21 | 1,456.70 | 32.94 | 12.25 | 58.77 | 8.31 | 79.32 | 70.31 |
| Kuwait | 19 | 155 | 74.84 | 3,103.55 | 933.04 | 33.07 | 0.00 | 70.34 | 6.90 | 77.24 | 77.24 |
| Luxembourg | 26 | 293 | 82.25 | 18,559.37 | 4,108.73 | 33.28 | 29.94 | 45.58 | 12.86 | 88.37 | 70.97 |
| Mexico | 62 | 938 | 84.65 | 6,586.55 | 2,620.79 | 34.91 | 35.50 | 44.32 | 2.20 | 82.02 | 62.50 |
| Netherlands | 97 | 758 | 52.11 | 5,669.77 | 1,724.40 | 29.60 | 12.47 | 42.52 | 28.38 | 83.37 | 76.35 |
| Oman | 13 | 158 | 97.47 | 5,381.85 | 624.47 | 32.69 | 10.24 | 74.18 | 1.13 | 85.55 | 76.14 |
| Peru | 17 | 198 | 84.85 | 1,750.50 | 443.17 | 32.71 | 36.41 | 44.60 | 0.00 | 81.01 | 60.09 |
| Philippines | 25 | 206 | 83.50 | 2,827.69 | 1,217.17 | 36.44 | 9.48 | 64.08 | 1.12 | 74.69 | 66.49 |
| Russia | 49 | 348 | 72.13 | 16,259.83 | 4,900.19 | 36.86 | 0.55 | 72.49 | 0.50 | 73.54 | 73.04 |
| Spain | 102 | 872 | 66.17 | 5,937.51 | 2,121.28 | 42.54 | 9.03 | 68.24 | 5.03 | 82.30 | 75.76 |
| Turkey | 24 | 334 | 90.42 | 4,461.52 | 1,615.26 | 40.31 | 9.61 | 68.00 | 0.00 | 77.61 | 71.00 |
| **French Civil Law** | **1077** | **9151** | **69.70** | **5,566.80** | **1,766.34** | **34.68** | **15.93** | **54.81** | **10.06** | **80.80** | **70.88** |
| **World** | **10136** | **127179** | **63.57** | **6,265.34** | **1,755.43** | **32.29** | **29.15** | **34.79** | **20.99** | **84.93** | **72.75** |

This table presents an overview of the debt structure and coverage within our sample of debt instruments at the firm level, categorized by country. The reported figures represent averages derived from firm-quarter observations within each country. The initial five columns delineate key attributes of firms within our sample for each country, including the number of firms, number of quarterly observations, the percentage of public firms, total assets (in USD millions), total debt (in USD million), and the leverage (total debt/total assets) expressed as a percentage. The subsequent columns provide distinct measures of debt coverage within our sample, all presented as percentages of total debt. These include the outstanding amounts of Arm's length debt specific to instruments in our sample, outstanding amounts of term loans specific to loans in our sample, outstanding amounts of drawn lines of credit specific to lines in our sample, the total outstanding amount of observed debt instruments (comprising bonds, loans, and lines of credit), the total ownership observed for these debt instruments. Missing data are disregarded in calculating the averages.

Table 3: Debt Ownership Concentration - Bank Debt

| Country | Num of Tranches (loans & lines) | Num of Loans | Num of Lines of Credit | Num Lenders | Num Lead Arrangers | Herfindahl of Lenders Amounts | Num to Cross 10% | Num to Cross 20% | Num to Cross 30% |
|---|---|---|---|---|---|---|---|---|---|
| Australia | 3.40 | 1.34 | 2.06 | 8.41 | 4.77 | 27.99 | 1.09 | 1.43 | 1.93 |
| Bermuda | 3.61 | 2.66 | 0.96 | 10.64 | 7.40 | 20.94 | 1.15 | 1.74 | 2.51 |
| Canada | 1.91 | 0.75 | 1.15 | 6.92 | 2.01 | 24.35 | 1.12 | 1.63 | 2.23 |
| Cayman Islands | 4.13 | 3.55 | 0.58 | 8.92 | 3.25 | 24.49 | 1.04 | 1.36 | 1.81 |
| Guernsey | 1.98 | 1.35 | 0.64 | 4.48 | 2.80 | 66.27 | 1.08 | 1.23 | 1.35 |
| Hong Kong | 2.21 | 1.92 | 0.29 | 15.30 | 8.05 | 16.51 | 1.18 | 1.86 | 2.69 |
| India | 3.90 | 3.67 | 0.24 | 14.58 | 4.53 | 28.04 | 1.11 | 1.49 | 2.07 |
| Ireland | 2.80 | 1.86 | 0.95 | 11.84 | 4.29 | 22.67 | 1.24 | 1.85 | 2.52 |
| Israel | 2.03 | 1.62 | 0.41 | 7.97 | 3.41 | 34.05 | 1.18 | 1.61 | 1.94 |
| Jersey | 1.53 | 0.42 | 1.10 | 3.78 | 3.27 | 53.07 | 1.14 | 1.34 | 1.62 |
| Malaysia | 3.50 | 3.16 | 0.34 | 7.31 | 4.65 | 33.73 | 1.02 | 1.25 | 1.64 |
| New Zealand | 3.52 | 0.73 | 2.80 | 3.66 | 2.29 | 37.43 | 1.00 | 1.04 | 1.27 |
| Pakistan | 1.11 | 1.11 | 0.00 | 5.55 | 3.39 | 31.54 | 1.04 | 1.40 | 1.88 |
| Qatar | 2.20 | 1.98 | 0.23 | 14.86 | 8.86 | 25.16 | 1.34 | 2.11 | 3.09 |
| Saudi Arabia | 3.85 | 3.80 | 0.06 | 13.02 | 11.19 | 27.54 | 1.15 | 1.66 | 2.30 |
| Singapore | 2.11 | 1.85 | 0.25 | 7.83 | 4.49 | 28.98 | 1.04 | 1.36 | 1.87 |
| South Africa | 3.44 | 2.32 | 1.12 | 11.20 | 6.46 | 25.04 | 1.21 | 1.73 | 2.40 |
| Thailand | 2.40 | 2.25 | 0.15 | 5.94 | 3.31 | 35.17 | 1.01 | 1.23 | 1.46 |
| United Arab Emirates | 2.38 | 2.22 | 0.15 | 11.12 | 6.18 | 20.82 | 1.26 | 1.88 | 2.72 |
| United Kingdom | 2.47 | 1.35 | 1.11 | 7.74 | 4.67 | 30.48 | 1.11 | 1.53 | 2.03 |
| United States | 1.99 | 1.05 | 0.95 | 9.33 | 2.76 | 24.49 | 1.20 | 1.83 | 2.54 |
| **English Common Law** | **2.10** | **1.14** | **0.96** | **9.15** | **3.05** | **25.05** | **1.18** | **1.76** | **2.43** |
| Denmark | 3.19 | 2.55 | 0.63 | 9.12 | 7.44 | 24.52 | 1.29 | 1.87 | 2.55 |
| Finland | 2.69 | 2.12 | 0.57 | 6.68 | 4.72 | 26.01 | 1.10 | 1.42 | 1.82 |
| Norway | 2.19 | 1.59 | 0.61 | 4.97 | 3.54 | 29.13 | 1.07 | 1.38 | 1.80 |
| Sweden | 3.32 | 2.50 | 0.81 | 6.57 | 5.23 | 36.10 | 1.13 | 1.50 | 1.91 |
| **Scandinavian Civil Law** | **2.69** | **2.03** | **0.66** | **6.07** | **4.55** | **30.22** | **1.11** | **1.47** | **1.90** |
| Austria | 5.24 | 4.54 | 0.69 | 9.96 | 7.01 | 21.47 | 1.02 | 1.33 | 1.91 |
| China | 1.54 | 1.48 | 0.06 | 8.56 | 4.27 | 26.98 | 1.07 | 1.44 | 1.96 |
| Germany | 4.74 | 3.99 | 0.76 | 12.08 | 6.90 | 25.94 | 1.24 | 1.84 | 2.51 |
| Japan | 3.89 | 3.47 | 0.42 | 7.74 | 1.82 | 26.87 | 1.02 | 1.24 | 1.63 |
| Poland | 2.33 | 1.62 | 0.71 | 9.69 | 7.87 | 19.17 | 1.23 | 1.96 | 2.90 |
| South Korea | 4.58 | 4.34 | 0.25 | 11.20 | 5.39 | 22.61 | 1.00 | 1.21 | 1.72 |
| Switzerland | 2.45 | 1.68 | 0.77 | 13.41 | 6.14 | 23.62 | 1.32 | 2.07 | 2.92 |
| Taiwan | 3.70 | 2.81 | 0.88 | 13.16 | 5.95 | 13.70 | 1.11 | 1.72 | 2.46 |
| **German Civil Law** | **3.79** | **3.22** | **0.57** | **9.82** | **3.77** | **22.99** | **1.08** | **1.46** | **2.00** |
| Argentina | 1.24 | 1.24 | 0.00 | 4.13 | 2.30 | 35.95 | 1.07 | 1.53 | 2.01 |
| Belgium | 2.63 | 1.73 | 0.90 | 10.69 | 6.06 | 25.77 | 1.27 | 1.89 | 2.61 |
| Brazil | 2.05 | 1.94 | 0.11 | 8.33 | 3.12 | 24.12 | 1.09 | 1.56 | 2.09 |
| Chile | 1.57 | 1.55 | 0.02 | 9.13 | 2.74 | 17.27 | 1.26 | 1.98 | 2.97 |
| Colombia | 1.55 | 1.41 | 0.14 | 4.93 | 2.97 | 30.07 | 1.08 | 1.60 | 2.22 |
| France | 4.00 | 2.81 | 1.20 | 11.82 | 6.46 | 18.70 | 1.15 | 1.78 | 2.53 |
| Greece | 3.77 | 3.28 | 0.49 | 9.49 | 4.31 | 30.32 | 1.10 | 1.48 | 2.01 |
| Indonesia | 2.56 | 1.91 | 0.65 | 11.23 | 5.91 | 23.13 | 1.10 | 1.57 | 2.14 |
| Italy | 3.56 | 2.70 | 0.86 | 10.72 | 6.21 | 20.67 | 1.15 | 1.74 | 2.47 |
| Kuwait | 2.93 | 2.66 | 0.27 | 15.37 | 5.57 | 22.21 | 1.61 | 2.47 | 3.48 |
| Luxembourg | 3.13 | 2.18 | 0.95 | 14.35 | 8.88 | 27.02 | 1.23 | 1.77 | 2.43 |
| Mexico | 2.01 | 1.78 | 0.23 | 10.44 | 3.64 | 20.60 | 1.21 | 1.81 | 2.58 |
| Netherlands | 3.39 | 2.34 | 1.06 | 11.63 | 6.34 | 19.33 | 1.32 | 2.06 | 2.84 |
| Oman | 1.87 | 1.83 | 0.04 | 10.08 | 7.03 | 19.71 | 1.23 | 1.87 | 2.57 |
| Peru | 0.84 | 0.84 | 0.00 | 4.88 | 1.38 | 27.47 | 1.15 | 1.45 | 1.90 |
| Philippines | 3.70 | 3.63 | 0.07 | 17.90 | 7.52 | 24.60 | 1.17 | 1.77 | 2.65 |
| Russia | 4.37 | 4.28 | 0.09 | 18.90 | 11.59 | 24.85 | 1.23 | 1.98 | 2.78 |
| Spain | 4.08 | 3.45 | 0.63 | 19.21 | 10.38 | 17.91 | 1.24 | 2.00 | 2.90 |
| Turkey | 4.46 | 4.46 | 0.00 | 11.41 | 6.98 | 22.10 | 1.17 | 1.70 | 2.47 |
| **French Civil Law** | **3.23** | **2.58** | **0.65** | **12.11** | **6.32** | **21.47** | **1.19** | **1.81** | **2.55** |
| **World** | **2.46** | **1.60** | **0.87** | **9.40** | **3.43** | **24.49** | **1.16** | **1.70** | **2.35** |

This table outlines the consolidated ownership concentration measures of bank debt (loans and lines of credit) at the firm level. The reported figures represent averages derived from firm-quarter observations within each country. The defined statistics include the total number of tranches (comprising loans and lines), the count of lenders, the count of domestic lenders, the HerfindahlHirschman index of lenders' amount, lending percentages of the 1, 3, 5, and 10 largest lenders in relation to the total tranches amount, the count of lenders to cross the thresholds of 10%, 20%, and 30% of ownership in total tranches amount. Missing data are disregarded in calculating the averages.

Table 4: Debt Ownership Concentration - Arm's Length Debt

| Country | Bonds Avg size USD m | Bonds Outstanding PAR % of Total Debt | Bond Ownership Observed % of Outstanding PAR | Num of Bond Issues | Num of Bondholders | Herfindahl of Bondholders Ownership | Num to Cross 10% | Num to Cross 20% | Num to Cross 30% |
|---|---|---|---|---|---|---|---|---|---|
| Australia | 262.49 | 4.47 | 31.23 | 0.31 | 7.36 | 9.16 | 1.33 | 2.25 | 3.73 |
| Bermuda | 303.21 | 26.08 | 48.64 | 1.39 | 69.81 | 6.69 | 1.36 | 2.66 | 4.45 |
| Canada | 252.99 | 30.88 | 45.90 | 2.34 | 105.21 | 6.51 | 1.74 | 3.53 | 6.15 |
| Cayman Islands | 312.99 | 16.61 | 53.91 | 0.73 | 38.74 | 7.44 | 1.17 | 2.02 | 3.30 |
| Guernsey | 266.28 | 15.23 | 33.46 | 0.52 | 23.44 | 9.68 | 1.29 | 2.12 | 2.88 |
| Hong Kong | 326.75 | 6.59 | 22.22 | 0.35 | 8.52 | 14.96 | 1.09 | 1.86 | 2.81 |
| India | 194.00 | 3.60 | 31.91 | 0.45 | 7.54 | 26.58 | 1.10 | 1.52 | 2.21 |
| Ireland | 446.12 | 25.81 | 58.15 | 3.54 | 175.51 | 4.05 | 1.86 | 3.94 | 6.92 |
| Israel | 612.49 | 6.07 | 16.72 | 0.22 | 6.62 | 15.79 | 1.50 | 2.00 | 2.50 |
| Jersey | 388.48 | 26.11 | 42.24 | 0.73 | 26.69 | 11.56 | 1.06 | 1.78 | 2.61 |
| Malaysia | 74.37 | 0.75 | 10.43 | 0.06 | 0.27 | 46.13 | 1.00 | 1.00 | 1.00 |
| New Zealand | 259.38 | 1.15 | 11.08 | 0.05 | 0.65 | 3.94 | 2.00 | 3.00 | 5.00 |
| Pakistan | . | 0.00 | . | 0.00 | 0.00 | . | . | . | . |
| Qatar | 420.00 | 0.91 | 3.78 | 0.05 | 0.23 | . | . | . | . |
| Saudi Arabia | 625.00 | 0.59 | 1.94 | 0.01 | 0.03 | . | . | . | . |
| Singapore | 192.53 | 8.80 | 32.36 | 0.64 | 19.63 | 11.62 | 1.36 | 2.31 | 3.78 |
| South Africa | 172.82 | 1.97 | 21.42 | 0.21 | 3.96 | 30.65 | 1.00 | 1.00 | 1.00 |
| Thailand | 80.82 | 2.12 | 25.66 | 0.22 | 0.78 | 60.37 | 1.00 | 1.00 | 1.00 |
| United Arab Emirates | 480.81 | 7.74 | 20.30 | 0.54 | 16.60 | 8.98 | 1.70 | 3.10 | 4.85 |
| United Kingdom | 385.58 | 10.90 | 37.13 | 0.64 | 33.72 | 5.73 | 1.65 | 3.38 | 5.80 |
| United States | 350.78 | 41.69 | 60.50 | 3.56 | 194.08 | 4.83 | 1.83 | 3.86 | 6.77 |
| **English Common Law** | **342.00** | **36.26** | **58.23** | **3.05** | **163.47** | **5.05** | **1.82** | **3.81** | **6.67** |
| Denmark | 613.41 | 8.89 | 32.70 | 0.33 | 17.81 | 8.05 | 1.00 | 1.85 | 2.92 |
| Finland | 267.02 | 17.99 | 15.77 | 0.95 | 22.96 | 8.76 | 1.29 | 2.50 | 4.29 |
| Norway | 116.24 | 31.66 | 38.39 | 2.69 | 24.76 | 10.55 | 1.22 | 2.19 | 3.35 |
| Sweden | 197.60 | 13.94 | 37.67 | 0.85 | 19.17 | 10.59 | 1.31 | 2.24 | 3.55 |
| **Scandinavian Civil Law** | **179.52** | **22.16** | **33.54** | **1.64** | **22.26** | **10.44** | **1.24** | **2.20** | **3.40** |
| Austria | 368.49 | 18.56 | 11.58 | 1.12 | 32.48 | 5.65 | 1.38 | 2.75 | 5.00 |
| China | 287.44 | 11.07 | 28.92 | 0.52 | 20.00 | 11.59 | 1.35 | 2.29 | 3.62 |
| Germany | 516.02 | 7.96 | 19.21 | 0.38 | 20.80 | 6.50 | 1.34 | 2.46 | 4.19 |
| Japan | 166.45 | 1.68 | 16.94 | 0.21 | 2.99 | 46.16 | 1.02 | 1.17 | 1.44 |
| Poland | 102.55 | 8.45 | 38.75 | 0.88 | 9.29 | 12.94 | 1.15 | 1.96 | 2.84 |
| South Korea | 227.20 | 7.44 | 28.02 | 0.38 | 8.98 | 24.17 | 1.29 | 1.82 | 2.71 |
| Switzerland | 338.93 | 9.79 | 19.63 | 0.44 | 12.80 | 8.12 | 1.58 | 3.00 | 5.16 |
| Taiwan | 109.30 | 1.20 | 15.07 | 0.07 | 0.45 | 74.96 | 1.00 | 1.06 | 1.18 |
| **German Civil Law** | **241.51** | **3.03** | **19.03** | **0.23** | **5.37** | **31.01** | **1.17** | **1.76** | **2.61** |
| Argentina | 160.86 | 33.15 | 39.58 | 1.15 | 28.58 | 11.09 | 1.02 | 1.33 | 2.14 |
| Belgium | 238.64 | 18.16 | 22.68 | 0.97 | 32.28 | 8.39 | 1.11 | 2.16 | 3.36 |
| Brazil | 235.15 | 18.38 | 36.13 | 0.97 | 50.18 | 8.85 | 1.50 | 2.67 | 4.11 |
| Chile | 1,016.41 | 32.24 | 47.01 | 1.60 | 49.23 | 14.15 | 1.10 | 1.79 | 2.78 |
| Colombia | 552.90 | 49.36 | 45.96 | 2.26 | 213.07 | 4.48 | 1.68 | 3.28 | 5.60 |
| France | 517.06 | 15.62 | 29.56 | 1.16 | 66.58 | 9.00 | 1.67 | 3.37 | 5.94 |
| Greece | 307.09 | 4.16 | 32.25 | 0.23 | 7.00 | 12.92 | 1.00 | 1.19 | 1.54 |
| Indonesia | 313.30 | 5.96 | 31.75 | 0.18 | 8.78 | 8.24 | 1.26 | 2.02 | 3.33 |
| Italy | 552.70 | 12.25 | 23.89 | 0.55 | 33.61 | 7.37 | 1.25 | 2.19 | 3.81 |
| Kuwait | . | 0.00 | . | 0.00 | 0.00 | . | . | . | . |
| Luxembourg | 582.39 | 29.94 | 41.52 | 3.09 | 237.10 | 3.48 | 2.44 | 5.88 | 10.95 |
| Mexico | 269.64 | 35.50 | 42.31 | 3.61 | 132.37 | 8.18 | 1.48 | 2.84 | 4.91 |
| Netherlands | 582.20 | 12.47 | 41.27 | 0.81 | 58.53 | 3.32 | 2.05 | 4.41 | 7.80 |
| Oman | 328.85 | 10.24 | 5.43 | 0.41 | 6.04 | . | . | . | . |
| Peru | 155.99 | 36.41 | 41.05 | 1.19 | 30.53 | 10.02 | 1.11 | 1.72 | 2.89 |
| Philippines | 473.23 | 9.48 | 15.91 | 0.44 | 10.24 | 12.51 | 1.00 | 1.17 | 1.50 |
| Russia | 171.76 | 0.55 | 14.92 | 0.14 | 1.36 | 67.19 | 1.00 | 1.00 | 1.00 |
| Spain | 502.74 | 9.03 | 22.29 | 0.36 | 19.49 | 6.10 | 1.33 | 2.42 | 3.98 |
| Turkey | 339.53 | 9.61 | 29.42 | 0.94 | 35.60 | 5.37 | 1.34 | 2.61 | 4.32 |
| **French Civil Law** | **426.34** | **15.93** | **33.09** | **1.10** | **53.90** | **8.16** | **1.52** | **2.94** | **5.10** |
| **World** | **338.51** | **29.15** | **54.86** | **2.43** | **126.97** | **5.51** | **1.79** | **3.73** | **6.53** |

This table outlines the consolidated ownership concentration measures of Arm's length debt (bond and commercial papers) at the firm level. The reported figures represent averages derived from firm-quarter observations within each country. The defined statistics include the average size of bonds (in USD millions), outstanding bond amount as a percentage of total debt, bond holding observed in eMAXX as a percentage of bonds outstanding amount (averaged across bonds' par held in eMAXX and weighted by the par outstanding of existing bonds within that quarter), the number of bonds and bondholders, HerfindahlHirschman index of bondholder's ownership, bond ownership of the 1, 3, 5, and 10 largest bondholders as percentage observed par ownerships. Missing data are disregarded in calculating the averages.

Table 5: Debt Ownership Concentration - All Creditors

| Country | Total Debt Ownership Observed % | Num Creditors | Herfindahl of Creditors Ownership | C1 | C3 | C5 | C10 | Num to Cross 10% | Num to Cross 20% | Num to Cross 30% |
|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 81.74 | 15.77 | 27.20 | 31.68 | 55.60 | 77.35 | 92.02 | 1.11 | 1.47 | 2.03 |
| Bermuda | 70.57 | 80.44 | 16.34 | 22.30 | 35.65 | 52.75 | 74.58 | 1.26 | 2.18 | 3.34 |
| Canada | 71.91 | 112.13 | 18.84 | 22.77 | 40.35 | 60.27 | 78.19 | 1.36 | 2.30 | 3.57 |
| Cayman Islands | 79.41 | 47.66 | 19.03 | 27.25 | 45.27 | 64.14 | 82.79 | 1.05 | 1.54 | 2.17 |
| Guernsey | 70.56 | 27.92 | 56.38 | 61.53 | 76.49 | 85.37 | 91.23 | 1.14 | 1.35 | 1.62 |
| Hong Kong | 75.76 | 23.82 | 16.07 | 21.55 | 37.60 | 58.17 | 82.29 | 1.18 | 1.89 | 2.76 |
| India | 71.40 | 22.13 | 27.88 | 36.60 | 51.56 | 68.33 | 86.28 | 1.12 | 1.50 | 2.11 |
| Ireland | 71.18 | 187.35 | 16.21 | 20.58 | 34.74 | 51.93 | 70.71 | 1.57 | 2.80 | 4.45 |
| Israel | 76.81 | 14.59 | 33.39 | 40.49 | 61.65 | 76.37 | 89.62 | 1.19 | 1.63 | 1.99 |
| Jersey | 75.00 | 30.47 | 42.51 | 47.96 | 64.65 | 77.02 | 88.24 | 1.17 | 1.46 | 1.83 |
| Malaysia | 79.29 | 7.59 | 33.74 | 38.53 | 64.32 | 80.93 | 95.22 | 1.02 | 1.24 | 1.64 |
| New Zealand | 87.47 | 4.32 | 37.11 | 42.77 | 74.58 | 94.95 | 99.55 | 1.00 | 1.04 | 1.29 |
| Pakistan | 78.82 | 5.55 | 31.54 | 34.31 | 52.41 | 78.65 | 98.90 | 1.04 | 1.40 | 1.88 |
| Qatar | 71.05 | 15.09 | 25.15 | 28.11 | 40.42 | 62.92 | 82.79 | 1.34 | 2.11 | 3.09 |
| Saudi Arabia | 79.62 | 13.05 | 27.53 | 34.81 | 48.59 | 65.24 | 86.02 | 1.15 | 1.67 | 2.31 |
| Singapore | 74.15 | 27.46 | 27.74 | 32.39 | 54.55 | 76.86 | 92.30 | 1.09 | 1.48 | 2.08 |
| South Africa | 75.13 | 15.16 | 24.95 | 28.94 | 48.81 | 69.19 | 86.44 | 1.21 | 1.73 | 2.42 |
| Thailand | 75.77 | 6.72 | 34.78 | 42.56 | 67.36 | 85.66 | 96.84 | 1.01 | 1.22 | 1.46 |
| United Arab Emirates | 78.49 | 27.72 | 20.04 | 23.80 | 39.30 | 62.90 | 85.55 | 1.29 | 1.94 | 2.86 |
| United Kingdom | 80.12 | 41.46 | 28.22 | 31.81 | 51.46 | 72.28 | 88.13 | 1.18 | 1.75 | 2.47 |
| United States | 71.45 | 203.41 | 16.20 | 21.33 | 33.19 | 47.95 | 65.57 | 1.59 | 2.98 | 4.87 |
| **English Common Law** | **72.35** | **172.62** | **17.79** | **22.79** | **36.16** | **52.09** | **69.66** | **1.51** | **2.75** | **4.42** |
| Denmark | 78.77 | 26.93 | 23.25 | 26.57 | 45.60 | 62.65 | 85.94 | 1.29 | 1.96 | 2.63 |
| Finland | 64.13 | 29.63 | 23.88 | 28.02 | 51.24 | 75.58 | 90.56 | 1.12 | 1.54 | 2.05 |
| Norway | 65.57 | 29.73 | 21.68 | 27.57 | 48.80 | 69.15 | 87.17 | 1.12 | 1.67 | 2.35 |
| Sweden | 74.10 | 25.75 | 30.01 | 35.33 | 55.48 | 74.87 | 89.35 | 1.17 | 1.62 | 2.19 |
| **Scandinavian Civil Law** | **68.78** | **28.34** | **24.66** | **29.85** | **50.98** | **71.57** | **88.36** | **1.14** | **1.65** | **2.27** |
| Austria | 61.06 | 42.44 | 19.41 | 26.45 | 45.63 | 68.35 | 89.17 | 1.03 | 1.40 | 2.01 |
| China | 74.59 | 28.57 | 25.42 | 32.35 | 51.30 | 71.56 | 89.13 | 1.10 | 1.55 | 2.19 |
| Germany | 74.98 | 32.88 | 24.70 | 29.13 | 47.43 | 65.98 | 85.01 | 1.25 | 1.87 | 2.62 |
| Japan | 76.66 | 10.73 | 26.72 | 32.84 | 57.70 | 82.14 | 96.38 | 1.02 | 1.24 | 1.64 |
| Poland | 73.49 | 18.98 | 17.78 | 20.58 | 37.54 | 64.63 | 84.46 | 1.25 | 1.98 | 2.99 |
| South Korea | 72.22 | 20.18 | 21.57 | 29.52 | 50.38 | 74.24 | 91.47 | 1.03 | 1.29 | 1.82 |
| Switzerland | 70.34 | 26.21 | 21.99 | 24.96 | 41.86 | 58.88 | 80.50 | 1.36 | 2.18 | 3.10 |
| Taiwan | 76.57 | 13.60 | 13.75 | 20.65 | 35.77 | 57.94 | 87.55 | 1.11 | 1.72 | 2.47 |
| **German Civil Law** | **76.04** | **15.19** | **22.67** | **28.79** | **49.81** | **72.79** | **92.04** | **1.08** | **1.47** | **2.03** |
| Argentina | 65.90 | 32.70 | 27.10 | 31.91 | 48.75 | 65.75 | 87.69 | 1.06 | 1.51 | 2.12 |
| Belgium | 68.70 | 42.97 | 23.88 | 27.96 | 44.56 | 64.45 | 83.15 | 1.24 | 1.87 | 2.71 |
| Brazil | 61.55 | 58.51 | 20.04 | 24.85 | 43.24 | 67.41 | 86.54 | 1.12 | 1.70 | 2.41 |
| Chile | 58.70 | 58.36 | 15.38 | 20.73 | 36.40 | 51.86 | 74.04 | 1.34 | 2.21 | 3.30 |
| Colombia | 52.60 | 218.00 | 12.20 | 18.24 | 29.35 | 45.65 | 66.84 | 1.43 | 2.41 | 3.75 |
| France | 70.90 | 78.41 | 17.14 | 21.00 | 37.48 | 60.77 | 83.09 | 1.25 | 2.06 | 3.09 |
| Greece | 75.88 | 16.50 | 29.67 | 35.56 | 51.57 | 68.94 | 89.77 | 1.11 | 1.52 | 2.05 |
| Indonesia | 78.82 | 20.02 | 22.02 | 26.99 | 48.27 | 68.82 | 87.70 | 1.12 | 1.64 | 2.26 |
| Italy | 70.31 | 44.33 | 18.96 | 23.08 | 40.99 | 63.21 | 85.29 | 1.19 | 1.84 | 2.66 |
| Kuwait | 77.24 | 15.37 | 22.21 | 28.21 | 47.06 | 62.82 | 79.93 | 1.61 | 2.46 | 3.53 |
| Luxembourg | 70.97 | 251.44 | 17.91 | 23.38 | 37.96 | 54.68 | 70.06 | 1.59 | 2.92 | 4.80 |
| Mexico | 62.50 | 142.80 | 13.53 | 18.90 | 32.53 | 50.70 | 69.92 | 1.43 | 2.47 | 3.92 |
| Netherlands | 76.35 | 70.17 | 17.52 | 21.49 | 37.97 | 57.59 | 78.46 | 1.42 | 2.34 | 3.38 |
| Oman | 76.14 | 16.13 | 19.40 | 26.43 | 41.44 | 61.35 | 84.24 | 1.28 | 1.93 | 2.70 |
| Peru | 60.09 | 35.40 | 19.71 | 26.90 | 46.03 | 62.97 | 81.27 | 1.15 | 1.61 | 2.33 |
| Philippines | 66.49 | 28.15 | 24.09 | 29.29 | 43.21 | 61.61 | 82.11 | 1.17 | 1.87 | 2.73 |
| Russia | 73.04 | 20.26 | 24.78 | 30.74 | 45.22 | 59.39 | 77.66 | 1.23 | 1.96 | 2.78 |
| Spain | 75.76 | 38.70 | 17.09 | 22.56 | 36.86 | 55.23 | 78.08 | 1.29 | 2.10 | 3.12 |
| Turkey | 71.00 | 47.01 | 18.71 | 26.16 | 39.54 | 59.89 | 83.45 | 1.25 | 1.82 | 2.61 |
| **French Civil Law** | **70.88** | **66.00** | **18.90** | **23.82** | **40.11** | **60.03** | **80.84** | **1.27** | **2.04** | **3.02** |
| **World** | **72.75** | **136.36** | **18.81** | **23.99** | **38.98** | **56.43** | **74.49** | **1.42** | **2.47** | **3.89** |

This table outlines the consolidated ownership concentration measures for all creditor. The reported figures represent averages derived from firm-quarter observations within each country. The reported columns show, respectively, the total ownership observed of identified debt instruments as a percentage of total debt, number of all creditors (holding bonds, loans, or lines of credit), HerfindahlHirschman index of creditors's ownership, the ownership stake of the largest 1, 3, 5, and 10 creditors as a percentage of total debt, Number of creditors to cross the 10%, 20%, and 30% of total debt in ownership. Missing data are disregarded in calculating the averages.

Table 6: Debt Maturity

| Country | Total Debt | Arm's Length Debt | Bank Debt | | |
|---|---|---|---|---|---|
| | | | Bank Loans | Credit Lines | Total Bank Debt |
| Australia | 2.55 | 5.15 | 2.83 | 2.10 | 2.39 |
| Bermuda | 4.57 | 5.49 | 3.42 | 2.83 | 3.26 |
| Canada | 4.35 | 6.87 | 3.13 | 2.39 | 2.58 |
| Cayman Islands | 3.26 | 4.91 | 2.65 | 2.64 | 2.66 |
| Guernsey | 4.91 | 4.38 | 5.41 | 2.91 | 4.89 |
| Hong Kong | 2.31 | 3.46 | 2.23 | 2.31 | 2.18 |
| India | 5.69 | 5.17 | 5.87 | 3.20 | 5.70 |
| Ireland | 5.05 | 8.21 | 3.34 | 2.75 | 3.12 |
| Israel | 3.83 | 8.38 | 3.70 | 1.88 | 3.38 |
| Jersey | 3.43 | 3.64 | 5.54 | 2.69 | 3.47 |
| Malaysia | 3.39 | 3.18 | 3.84 | 1.76 | 3.38 |
| New Zealand | 2.37 | 4.58 | 2.34 | 2.33 | 2.31 |
| Pakistan | 5.04 | . | 5.14 | . | 5.04 |
| Qatar | 5.26 | 6.37 | 5.75 | 1.48 | 5.20 |
| Saudi Arabia | 4.99 | 4.68 | 5.04 | 2.14 | 4.97 |
| Singapore | 2.60 | 3.55 | 2.44 | 2.36 | 2.39 |
| South Africa | 2.30 | 2.74 | 2.42 | 2.30 | 2.26 |
| Thailand | 4.32 | 3.12 | 4.43 | 4.89 | 4.32 |
| United Arab Emirates | 3.65 | 5.97 | 3.44 | 3.30 | 3.40 |
| United Kingdom | 3.50 | 6.65 | 3.26 | 2.64 | 2.94 |
| United States | 5.83 | 8.45 | 3.34 | 2.73 | 3.01 |
| **English Common Law** | **5.39** | **8.19** | **3.35** | **2.67** | **3.00** |
| Denmark | 3.48 | 3.45 | 3.76 | 2.94 | 3.40 |
| Finland | 3.26 | 3.57 | 3.15 | 2.80 | 3.07 |
| Norway | 3.32 | 3.38 | 3.25 | 2.64 | 3.10 |
| Sweden | 3.59 | 3.26 | 3.83 | 2.74 | 3.52 |
| **Scandinavian Civil Law** | **3.40** | **3.39** | **3.43** | **2.73** | **3.25** |
| Austria | 3.30 | 2.94 | 4.06 | 2.55 | 3.53 |
| China | 3.88 | 3.56 | 3.99 | 2.40 | 3.87 |
| Germany | 3.37 | 4.44 | 3.38 | 2.64 | 3.23 |
| Japan | 3.34 | 3.77 | 3.74 | 1.24 | 3.36 |
| Poland | 3.19 | 3.24 | 3.38 | 2.64 | 3.19 |
| South Korea | 4.05 | 6.43 | 3.85 | 6.84 | 3.80 |
| Switzerland | 3.09 | 5.01 | 2.78 | 2.61 | 2.72 |
| Taiwan | 2.70 | 2.74 | 2.84 | 2.37 | 2.69 |
| **German Civil Law** | **3.20** | **3.76** | **3.46** | **1.98** | **3.18** |
| Argentina | 3.02 | 4.72 | 2.20 | . | 2.05 |
| Belgium | 4.13 | 4.82 | 3.75 | 2.72 | 3.44 |
| Brazil | 3.34 | 4.33 | 3.23 | 2.06 | 3.14 |
| Chile | 5.39 | 8.60 | 2.77 | 1.61 | 2.63 |
| Colombia | 5.70 | 7.61 | 3.69 | 3.48 | 3.48 |
| France | 3.57 | 4.60 | 3.38 | 2.83 | 3.19 |
| Greece | 4.59 | 4.97 | 4.61 | 4.49 | 4.64 |
| Indonesia | 2.96 | 3.94 | 3.07 | 2.18 | 2.82 |
| Italy | 3.21 | 4.16 | 3.06 | 2.60 | 3.00 |
| Kuwait | 1.91 | . | 1.99 | 1.87 | 1.91 |
| Luxembourg | 3.81 | 5.12 | 3.55 | 2.60 | 3.30 |
| Mexico | 5.32 | 7.99 | 2.75 | 2.62 | 2.73 |
| Netherlands | 3.55 | 6.35 | 3.16 | 2.42 | 2.90 |
| Oman | 5.35 | 1.89 | 5.40 | 7.86 | 5.31 |
| Peru | 4.38 | 6.20 | 2.82 | . | 2.68 |
| Philippines | 3.75 | 4.81 | 3.42 | 3.07 | 3.39 |
| Russia | 3.27 | 4.56 | 3.32 | 2.30 | 3.26 |
| Spain | 3.70 | 5.51 | 3.42 | 2.85 | 3.34 |
| Turkey | 3.35 | 4.97 | 3.35 | . | 3.33 |
| **French Civil Law** | **3.77** | **5.67** | **3.27** | **2.70** | **3.14** |
| **World** | **4.88** | **7.78** | **3.37** | **2.60** | **3.05** |

This table outlines the maturity durations, measured in years, for different types of debt. The reported figures represent averages derived from firm-quarter observations within each country. The columns present the overall maturity of debt, the maturity of Arm's length debt (bonds and commercial papers), and maturity of bank debt (loans and lines of credit). Averages within firm-quarters are computed with weights assigned based on the par value of debt instruments. Missing data are disregarded in calculating the averages.

Table 7: Secured Debt

| Country | Secured Debt (% of Total Debt) | Arm's Length Secured Debt (% of Total Secured Debt) | Bank Secured Debt (% of Total Secured Debt) |
|---|---|---|---|
| Australia | 18.77 | 3.23 | 96.77 |
| Bermuda | 47.38 | 1.68 | 98.32 |
| Canada | 27.11 | 10.48 | 89.52 |
| Cayman Islands | 42.32 | 28.11 | 71.89 |
| Guernsey | 33.57 | 0.00 | 100.00 |
| Hong Kong | 13.51 | 5.40 | 94.60 |
| India | 33.32 | 3.51 | 96.49 |
| Ireland | 36.03 | 2.41 | 97.59 |
| Israel | 70.03 | 0.00 | 100.00 |
| Jersey | 30.61 | 33.33 | 66.67 |
| Malaysia | 34.75 | 0.00 | 100.00 |
| New Zealand | 13.77 | 0.00 | 100.00 |
| Pakistan | 0.01 | 0.00 | 100.00 |
| Qatar | 39.56 | 0.00 | 100.00 |
| Saudi Arabia | 47.51 | 0.00 | 100.00 |
| Singapore | 17.12 | 3.60 | 96.40 |
| South Africa | 11.73 | 0.00 | 100.00 |
| Thailand | 19.26 | 4.07 | 95.93 |
| United Arab Emirates | 27.37 | 3.64 | 96.36 |
| United Kingdom | 27.10 | 7.15 | 92.85 |
| United States | 37.60 | 11.91 | 88.09 |
| **English Common Law** | **35.16** | **11.08** | **88.92** |
| Denmark | 43.94 | 0.00 | 100.00 |
| Finland | 17.80 | 4.13 | 95.87 |
| Norway | 45.66 | 12.00 | 88.00 |
| Sweden | 32.77 | 2.69 | 97.31 |
| **Scandinavian Civil Law** | **36.44** | **7.63** | **92.37** |
| Austria | 6.88 | 0.00 | 100.00 |
| China | 27.32 | 3.40 | 96.60 |
| Germany | 22.93 | 3.65 | 96.35 |
| Japan | 2.81 | 3.80 | 96.20 |
| Poland | 33.21 | 15.89 | 84.11 |
| South Korea | 23.83 | 0.00 | 100.00 |
| Switzerland | 26.90 | 1.60 | 98.40 |
| Taiwan | 58.04 | 0.13 | 99.87 |
| **German Civil Law** | **21.70** | **1.44** | **98.56** |
| Argentina | 17.95 | 0.00 | 100.00 |
| Belgium | 30.03 | 2.46 | 97.54 |
| Brazil | 31.42 | 2.74 | 97.26 |
| Chile | 1.35 | 50.00 | 50.00 |
| Colombia | 17.47 | 94.44 | 5.56 |
| France | 21.50 | 4.42 | 95.58 |
| Greece | 51.20 | 0.00 | 100.00 |
| Indonesia | 25.25 | 5.00 | 95.00 |
| Italy | 21.00 | 6.56 | 93.44 |
| Kuwait | 24.88 | 0.00 | 100.00 |
| Luxembourg | 39.68 | 6.25 | 93.75 |
| Mexico | 10.13 | 36.74 | 63.26 |
| Netherlands | 25.79 | 9.49 | 90.51 |
| Oman | 30.65 | 0.00 | 100.00 |
| Peru | 16.03 | 0.00 | 100.00 |
| Philippines | 15.97 | 0.00 | 100.00 |
| Russia | 61.56 | 0.00 | 100.00 |
| Spain | 33.83 | 5.71 | 94.29 |
| Turkey | 18.53 | 0.00 | 100.00 |
| **French Civil Law** | **24.98** | **6.16** | **93.84** |
| **World** | **32.31** | **9.72** | **90.28** |

This table describes the composition of debt in terms of security within each country. The reported figures represent averages derived from firm-quarter observations within each country in our sample. The columns present the secured debt (any lien) percentage of total debt, arm's length secured debt percentage of total secured debt, and bank secured debt percentage of total secured debt. Averages within firm-quarters are computed with weights assigned based on the par value of debt instruments. Missing data are disregarded in calculating the averages.

Table 8: Debt Currency

| Country | Local Currency % | USD % | EUR % | GBP % | JPY % | CAD % | AUD % | NZD % | NOK % | SEK % | CHF % | Other Currencies % | Arm's Length Debt in USD (foreign) % of Total Arm's Length Debt | Bank Debt in USD (foreign) % of Total Bank Debt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 76.35 | 19.36 | 1.72 | 0.71 | 0.00 | 0.18 | 76.35 | 0.92 | 0.00 | 0.00 | 0.02 | 0.73 | 50.61 | 16.55 |
| Bermuda | 0.26 | 95.16 | 1.15 | 1.15 | 0.00 | 0.00 | 0.09 | 0.00 | 0.23 | 0.00 | 0.01 | 2.20 | 92.20 | 94.90 |
| Canada | 61.69 | 36.97 | 0.92 | 0.27 | 0.00 | 61.69 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 42.97 | 33.28 |
| Cayman Islands | 0.00 | 84.32 | 0.66 | 0.02 | 0.00 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.11 | 94.37 | 76.82 |
| Guernsey | 0.00 | 57.65 | 11.27 | 31.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 73.13 | 58.58 |
| Hong Kong | 62.48 | 29.79 | 0.31 | 0.51 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.06 | 69.25 | 54.29 | 24.61 |
| India | 75.72 | 21.85 | 2.10 | 0.06 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 75.92 | 25.73 | 13.61 |
| Ireland | 25.06 | 70.80 | 25.06 | 3.62 | 0.00 | 0.12 | 0.33 | 0.00 | 0.01 | 0.00 | 0.01 | 0.06 | 87.23 | 68.39 |
| Israel | 17.70 | 80.47 | 1.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 17.90 | 65.93 | 82.00 |
| Jersey | 0.00 | 39.67 | 10.17 | 49.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.98 | 62.50 | 39.15 |
| Malaysia | 69.10 | 22.08 | 0.44 | 0.00 | 0.00 | 0.00 | 2.91 | 0.11 | 0.00 | 0.00 | 0.00 | 74.46 | 7.45 | 21.25 |
| New Zealand | 84.82 | 7.03 | 0.10 | 1.53 | 0.00 | 0.00 | 5.38 | 84.82 | 0.00 | 0.00 | 0.00 | 1.14 | 7.80 | 6.13 |
| Pakistan | 90.70 | 8.58 | 0.72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 90.70 | 0.00 | 8.59 |
| Qatar | 46.21 | 51.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48.53 | 22.22 | 51.80 |
| Saudi Arabia | 77.09 | 22.75 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 77.20 | 13.79 | 23.33 |
| Singapore | 64.83 | 30.39 | 0.20 | 0.12 | 0.01 | 0.00 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 | 68.63 | 36.80 | 29.48 |
| South Africa | 50.60 | 31.11 | 10.92 | 4.10 | 0.00 | 0.00 | 1.04 | 0.00 | 0.00 | 0.00 | 2.09 | 50.74 | 33.05 | 30.71 |
| Thailand | 65.18 | 31.71 | 0.47 | 0.00 | 0.17 | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 67.11 | 4.15 | 31.98 |
| United Arab Emirates | 43.14 | 55.00 | 0.80 | 0.48 | 0.00 | 0.06 | 0.05 | 0.00 | 0.04 | 0.00 | 0.21 | 43.36 | 65.13 | 53.47 |
| United Kingdom | 68.19 | 24.48 | 6.49 | 68.19 | 0.00 | 0.06 | 0.14 | 0.00 | 0.27 | 0.02 | 0.04 | 0.32 | 46.66 | 23.72 |
| United States | 98.11 | 98.11 | 1.29 | 0.21 | 0.02 | 0.22 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.06 | 0.00 | 0.00 |
| **English Common Law** | **89.93** | **84.01** | **1.63** | **3.31** | **0.01** | **5.48** | **1.35** | **0.26** | **0.02** | **0.01** | **0.02** | **3.91** | **5.35** | **6.76** |
| Denmark | 34.17 | 15.62 | 47.53 | 2.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.64 | 0.00 | 0.00 | 34.19 | 0.00 | 16.98 |
| Finland | 98.49 | 1.14 | 98.49 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.15 | 0.10 | 0.07 | 0.72 | 1.74 |
| Norway | 50.16 | 32.62 | 14.67 | 0.82 | 0.00 | 0.08 | 0.00 | 0.00 | 50.16 | 1.32 | 0.01 | 0.32 | 29.24 | 34.09 |
| Sweden | 60.64 | 14.42 | 23.36 | 0.29 | 0.00 | 0.06 | 0.00 | 0.00 | 0.86 | 60.64 | 0.07 | 0.30 | 9.94 | 15.81 |
| **Scandinavian Civil Law** | **61.09** | **20.11** | **35.34** | **0.61** | **0.00** | **0.05** | **0.00** | **0.00** | **22.57** | **18.49** | **0.04** | **2.79** | **17.29** | **20.92** |
| Austria | 96.39 | 3.47 | 96.39 | 0.04 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.07 | 4.46 | 4.55 |
| China | 70.18 | 25.90 | 0.13 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 73.93 | 46.28 | 18.77 |
| Germany | 94.73 | 4.74 | 94.73 | 0.09 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.10 | 8.27 | 5.13 |
| Japan | 98.23 | 1.48 | 0.26 | 0.00 | 98.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 2.18 | 0.86 |
| Poland | 71.62 | 9.90 | 17.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.80 | 71.63 | 0.68 | 10.50 |
| South Korea | 58.61 | 40.86 | 0.33 | 0.05 | 0.03 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.09 | 58.64 | 19.66 | 33.75 |
| Switzerland | 44.29 | 28.07 | 24.93 | 2.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 44.29 | 0.03 | 24.66 | 26.77 |
| Taiwan | 85.13 | 13.92 | 0.42 | 0.11 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 85.52 | 6.32 | 12.00 |
| **German Civil Law** | **91.40** | **7.22** | **10.72** | **0.08** | **53.31** | **0.02** | **0.00** | **0.00** | **0.00** | **0.00** | **0.80** | **27.84** | **6.57** | **5.96** |
| Argentina | 35.25 | 63.59 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 35.25 | 70.48 | 36.32 |
| Belgium | 74.11 | 24.57 | 74.11 | 0.31 | 0.00 | 0.34 | 0.19 | 0.09 | 0.17 | 0.00 | 0.01 | 0.20 | 22.99 | 23.70 |
| Brazil | 62.89 | 32.68 | 4.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 62.96 | 16.63 | 35.28 |
| Chile | 1.70 | 43.92 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 55.93 | 33.22 | 74.76 |
| Colombia | 26.33 | 73.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 26.41 | 84.83 | 46.94 |
| France | 91.85 | 7.38 | 91.85 | 0.54 | 0.00 | 0.09 | 0.00 | 0.00 | 0.01 | 0.01 | 0.04 | 0.09 | 11.17 | 7.43 |
| Greece | 41.59 | 58.36 | 41.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.03 | 62.80 | 58.50 |
| Indonesia | 10.19 | 89.03 | 0.58 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.36 | 62.44 | 88.28 |
| Italy | 97.24 | 2.50 | 97.24 | 0.19 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 12.25 | 1.47 |
| Kuwait | 83.66 | 15.55 | 0.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 84.04 | 1.17 | 16.89 |
| Luxembourg | 34.70 | 63.56 | 34.70 | 1.41 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.01 | 0.11 | 0.18 | 48.58 | 62.80 |
| Mexico | 27.26 | 70.17 | 1.95 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 27.61 | 68.88 | 52.32 |
| Netherlands | 70.91 | 26.22 | 70.91 | 2.43 | 0.01 | 0.23 | 0.08 | 0.00 | 0.02 | 0.00 | 0.00 | 0.10 | 44.96 | 23.54 |
| Oman | 60.66 | 38.84 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.68 | 33.86 | 36.98 |
| Peru | 11.78 | 88.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.82 | 76.28 | 78.27 |
| Philippines | 24.08 | 72.56 | 1.19 | 0.48 | 1.27 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.07 | 24.42 | 42.63 | 69.90 |
| Russia | 18.43 | 66.56 | 14.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18.46 | 46.15 | 64.91 |
| Spain | 93.28 | 5.40 | 93.28 | 0.19 | 0.00 | 0.14 | 0.09 | 0.00 | 0.00 | 0.00 | 0.01 | 0.89 | 10.33 | 5.60 |
| Turkey | 10.25 | 50.51 | 39.09 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.30 | 62.17 | 47.72 |
| **French Civil Law** | **58.40** | **37.07** | **50.32** | **0.44** | **0.03** | **0.06** | **0.03** | **0.00** | **0.01** | **0.00** | **0.02** | **12.02** | **37.87** | **33.98** |
| **World** | **87.30** | **66.92** | **7.26** | **2.53** | **8.57** | **4.10** | **1.01** | **0.19** | **0.54** | **0.44** | **0.14** | **8.29** | **7.10** | **8.80** |

This table describes the composition of debt in terms of currency of issue within each country. The reported figures represent averages derived from firm-quarter observations within each country. The columns illustrate the percentages of total debt issued in the local currency, USD, EUR, and other major currencies. Averages within firm-quarters are computed with weights assigned based on the par value of debt instruments. Missing data are disregarded in calculating the averages.

## Table 9: Number of Creditors

| | (1) All Creditors | (2) Arm's Length Creditors | (3) Banks | (4) Lead Arrangers | (5) All Creditors | (6) Arm's Length Creditors | (7) Banks | (8) Lead Arrangers | (9) All Creditors | (10) Arm's Length Creditors | (11) Banks | (12) Lead Arrangers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| French | -80.78*** | -82.90*** | 2.12** | 2.69*** | | | | | | | | |
| | (20.67) | (20.87) | (0.99) | (0.70) | | | | | | | | |
| German | -35.57 | -38.47* | 2.90** | 1.00 | | | | | | | | |
| | (23.13) | (22.45) | (1.38) | (1.14) | | | | | | | | |
| Scandinavian | -107.41*** | -106.06*** | -1.35*** | 1.75*** | | | | | | | | |
| | (14.39) | (14.49) | (0.28) | (0.44) | | | | | | | | |
| anti self dealing Index | | | | | 84.20 | 88.38 | -4.19** | -1.91 | | | | |
| | | | | | (72.46) | (72.89) | (1.79) | (2.18) | | | | |
| SizeGroup=0 × anti self dealing Index | | | | | | | | | 859.04*** | 863.85*** | -4.81 | -1.04 |
| | | | | | | | | | (260.10) | (264.90) | (5.87) | (2.40) |
| SizeGroup=1 × anti self dealing Index | | | | | | | | | 417.48*** | 423.82*** | -6.34 | -2.63 |
| | | | | | | | | | (118.30) | (121.11) | (3.77) | (2.15) |
| SizeGroup=2 × anti self dealing Index | | | | | | | | | 137.01*** | 141.54*** | -4.54** | -2.21 |
| | | | | | | | | | (48.90) | (49.13) | (1.93) | (2.10) |
| SizeGroup=3 × anti self dealing Index | | | | | | | | | 46.82 | 50.69 | -3.87** | -1.67 |
| | | | | | | | | | (58.83) | (59.26) | (1.76) | (2.25) |
| log assets | 98.14*** | 95.74*** | 2.41*** | 0.78*** | 100.29*** | 98.00*** | 2.29*** | 0.72*** | 150.49*** | 148.42*** | 2.07*** | 0.65* |
| | (23.97) | (24.18) | (0.25) | (0.27) | (22.62) | (22.77) | (0.20) | (0.23) | (42.16) | (42.71) | (0.61) | (0.33) |
| log age | 4.54 | 5.34 | -0.79*** | -0.48*** | 0.62 | 1.33 | -0.71*** | -0.35*** | -1.26 | -0.55 | -0.71*** | -0.36*** |
| | (5.40) | (5.44) | (0.13) | (0.16) | (3.55) | (3.58) | (0.13) | (0.11) | (3.14) | (3.15) | (0.12) | (0.11) |
| Log GDP per capita | 20.67** | 21.69*** | -1.03** | -0.50* | 33.26*** | 34.94*** | -1.67*** | -0.98*** | 6.11 | 7.65 | -1.54*** | -0.93*** |
| | (7.75) | (7.85) | (0.51) | (0.25) | (7.95) | (7.87) | (0.49) | (0.31) | (16.57) | (16.65) | (0.48) | (0.27) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q |
| Cluster | C | C | C | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.439 | 0.430 | 0.146 | 0.168 | 0.438 | 0.430 | 0.140 | 0.144 | 0.505 | 0.498 | 0.141 | 0.146 |
| N | 122049 | 122049 | 122049 | 122049 | 119896 | 119896 | 119896 | 119896 | 119896 | 119896 | 119896 | 119896 |

The table investigates the association of ownership dispersion, measured by the number of different types of creditors with the legal environment. The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category, in addition to the composite anti-self-dealing index, which represents the average of the ex ante and ex post private control of self-dealing measures according to Djankov et al. (2008b). This index ranges from 0 to 1; SizeGroup includes the quartile of firms' size (total assets in USD) in the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Controls for the logarithm of GDP per capita for a given year in each country, the logarithm of firm age and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: Creditor Concentration- Number to Cross 30%

| | (1) All Creditors | (2) Arm's Length Creditors | (3) Banks | (4) All Creditors | (5) Arm's Length Creditors | (6) Banks | (7) All Creditors | (8) Arm's Length Creditors | (9) Banks |
|---|---|---|---|---|---|---|---|---|---|
| French | -0.98*** | -0.92** | 0.08 | | | | | | |
| | (0.25) | (0.45) | (0.08) | | | | | | |
| German | -0.65 | -2.31** | -0.02 | | | | | | |
| | (0.43) | (1.13) | (0.26) | | | | | | |
| Scandinavian | -1.53*** | -0.34 | -0.44*** | | | | | | |
| | (0.17) | (0.48) | (0.04) | | | | | | |
| anti self dealing Index | | | | 1.07 | 0.28 | -0.14 | | | |
| | | | | (1.02) | (0.75) | (0.28) | | | |
| SizeGroup=0 × anti self dealing Index | | | | | | | 7.85*** | 15.27*** | 0.39 |
| | | | | | | | (1.89) | (2.53) | (0.52) |
| SizeGroup=1 × anti self dealing Index | | | | | | | 3.35*** | 4.83*** | -0.27 |
| | | | | | | | (0.99) | (0.72) | (0.38) |
| SizeGroup=2 × anti self dealing Index | | | | | | | 1.22 | 1.35* | -0.16 |
| | | | | | | | (0.82) | (0.69) | (0.31) |
| SizeGroup=3 × anti self dealing Index | | | | | | | 0.96 | 0.25 | -0.11 |
| | | | | | | | (0.94) | (0.71) | (0.28) |
| log assets | 1.38*** | 2.32*** | 0.46*** | 1.41*** | 2.33*** | 0.46*** | 1.76*** | 2.58*** | 0.46*** |
| | (0.27) | (0.11) | (0.06) | (0.25) | (0.10) | (0.05) | (0.34) | (0.14) | (0.05) |
| log age | 0.07 | -0.19*** | -0.04** | 0.01 | -0.21*** | -0.05** | -0.00 | -0.20*** | -0.05** |
| | (0.04) | (0.05) | (0.02) | (0.03) | (0.03) | (0.02) | (0.03) | (0.03) | (0.02) |
| Log GDP per capita | 0.27** | 0.63** | 0.01 | 0.45*** | 1.19*** | -0.01 | 0.27** | 1.09*** | -0.00 |
| | (0.12) | (0.29) | (0.05) | (0.12) | (0.16) | (0.06) | (0.12) | (0.14) | (0.05) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q |
| Cluster | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.474 | 0.543 | 0.241 | 0.472 | 0.541 | 0.240 | 0.500 | 0.550 | 0.243 |
| N | 122049 | 46841 | 101452 | 119896 | 46474 | 99494 | 119896 | 46474 | 99494 |

The table investigates the association of ownership dispersion, measured by the minimum number of different types of creditors to cross the 30% in ownership, in their debt type (all, arm's length debt, or bank debt) with the legal environment. The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category, in addition to the composite anti-self-dealing index, which represents the average of the ex ante and ex post private control of self-dealing measures according to Djankov et al. (2008b). This index ranges from 0 to 1; SizeGroup includes the quartile of firms' size (total assets in USD) in the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Controls for the logarithm of GDP per capita for a given year in each country, the logarithm of firm age and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11: Secured Debt

| | (1) Total Secured Debt | (2) Secured Arm's Length Debt | (3) Secured Bank Debt | (4) Total Secured Debt | (5) Secured Arm's Length Debt | (6) Secured Bank Debt | (7) Total Secured Debt | (8) Secured Arm's Length Debt | (9) Secured Bank Debt |
|---|---|---|---|---|---|---|---|---|---|
| French | -21.27*** | -1.34 | -19.79*** | | | | | | |
| | (3.99) | (0.89) | (3.87) | | | | | | |
| German | -34.25*** | -2.29*** | -30.74*** | | | | | | |
| | (7.35) | (0.77) | (6.61) | | | | | | |
| Scandinavian | -22.65*** | -1.64 | -22.73*** | | | | | | |
| | (6.54) | (1.56) | (5.71) | | | | | | |
| CR | | | | 6.00*** | 0.13 | 5.36*** | | | |
| | | | | (1.60) | (0.21) | (1.51) | | | |
| SizeGroup=0 × CR | | | | | | | -13.36*** | -0.20 | -12.88*** |
| | | | | | | | (2.31) | (0.52) | (2.35) |
| SizeGroup=1 × CR | | | | | | | 1.78 | -0.08 | 1.71 |
| | | | | | | | (2.08) | (0.35) | (2.25) |
| SizeGroup=2 × CR | | | | | | | 4.44*** | 0.25 | 3.72*** |
| | | | | | | | (1.36) | (0.26) | (1.27) |
| SizeGroup=3 × CR | | | | | | | 6.79*** | 0.06 | 6.19*** |
| | | | | | | | (1.71) | (0.26) | (1.62) |
| log assets | -10.53*** | 0.10 | -10.46*** | -10.51*** | 0.06 | -10.40*** | -12.73*** | 0.05 | -12.49*** |
| | (2.11) | (0.16) | (1.97) | (2.12) | (0.14) | (2.00) | (1.49) | (0.16) | (1.40) |
| log age | -5.48*** | 0.37 | -5.90*** | -5.89*** | 0.31 | -6.22*** | -5.63*** | 0.31 | -5.97*** |
| | (0.82) | (0.23) | (0.62) | (1.05) | (0.26) | (0.79) | (0.92) | (0.27) | (0.67) |
| Log GDP per capita | -3.06* | 0.91** | -4.18** | -10.53*** | 0.23 | -10.85*** | -8.72*** | 0.26 | -9.16*** |
| | (1.81) | (0.39) | (1.63) | (3.39) | (0.38) | (3.12) | (2.79) | (0.38) | (2.54) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q & R | I & Q & R | I & Q & R | I & Q & R | I & Q & R | I & Q & R |
| Cluster | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.285 | 0.121 | 0.306 | 0.282 | 0.126 | 0.302 | 0.294 | 0.126 | 0.314 |
| N | 121587 | 121587 | 121587 | 120368 | 120368 | 120368 | 120368 | 120368 | 120368 |

The table investigates the association of secured debt, measured as a percentage of total debt type (all debt, arm's length debt, or bank debt) with the legal environment. The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category. Additionally, the creditor rights index, which ranges from 0 to 4, is included. A score of 1 is assigned for each of the following rights of secured lenders as defined in laws and regulations: (i) there are restrictions, such as creditor consent or minimum dividends, preventing a debtor from filing for reorganization; (ii) secured creditors can seize their collateral after the reorganization petition is approved (i.e., there is no automatic stay or asset freeze); (iii) secured creditors are paid first from the proceeds of liquidating a bankrupt firm, rather than other creditors such as the government or workers; and (iv) management does not retain administration of the property pending the resolution of the reorganization. The index is derived from Djankov et al. (2007), who extended, revised, and updated the original index compiled by La Porta et al. (1997, 1998). SizeGroup includes the quartile of firms' size (total assets in USD) within the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Columns (4) to (9) also include region fixed effects corresponding to the continents as classified by the World Bank. Controls for the logarithm of GDP per capita for each year in each country, the logarithm of firm age, and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 12: Debt Maturity

| | (1) Total Debt | (2) Arm's Length Debt | (3) Bank Debt | (4) Total Debt | (5) Arm's Length Debt | (6) Bank Debt | (7) Total Debt | (8) Arm's Length Debt | (9) Bank Debt |
|---|---|---|---|---|---|---|---|---|---|
| French | -1.41*** | -1.90*** | -0.26 | | | | | | |
| | (0.28) | (0.67) | (0.21) | | | | | | |
| German | -0.69*** | -3.45*** | 0.16 | | | | | | |
| | (0.17) | (0.42) | (0.25) | | | | | | |
| Scandinavian | -1.20*** | -2.92*** | 0.30** | | | | | | |
| | (0.30) | (0.40) | (0.13) | | | | | | |
| anti self dealing Index | | | | 1.01 | 3.50 | -0.56* | | | |
| | | | | (1.04) | (2.09) | (0.30) | | | |
| SizeGroup=0 × anti self dealing Index | | | | | | | 5.55*** | 10.05*** | -0.56 |
| | | | | | | | (1.14) | (2.56) | (0.47) |
| SizeGroup=1 × anti self dealing Index | | | | | | | 2.65*** | 6.11*** | -0.58* |
| | | | | | | | (0.82) | (1.88) | (0.34) |
| SizeGroup=2 × anti self dealing Index | | | | | | | 1.13 | 4.30** | -0.47 |
| | | | | | | | (0.79) | (1.90) | (0.29) |
| SizeGroup=3 × anti self dealing Index | | | | | | | 0.93 | 3.41 | -0.62* |
| | | | | | | | (1.03) | (2.04) | (0.32) |
| log assets | 0.97*** | 1.14*** | 0.13** | 0.99*** | 1.17*** | 0.11** | 1.24*** | 1.34*** | 0.12 |
| | (0.16) | (0.07) | (0.06) | (0.15) | (0.06) | (0.04) | (0.18) | (0.07) | (0.08) |
| log age | 0.41*** | 0.52*** | -0.08* | 0.37*** | 0.45*** | -0.05 | 0.36*** | 0.46*** | -0.05 |
| | (0.06) | (0.04) | (0.04) | (0.07) | (0.07) | (0.05) | (0.07) | (0.06) | (0.04) |
| Log GDP per capita | -0.04 | -0.02 | -0.33** | 0.24 | 0.59 | -0.27* | 0.11 | 0.51 | -0.28* |
| | (0.11) | (0.40) | (0.16) | (0.19) | (0.39) | (0.16) | (0.17) | (0.39) | (0.16) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q |
| Cluster | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.359 | 0.306 | 0.055 | 0.357 | 0.290 | 0.052 | 0.366 | 0.292 | 0.053 |
| N | 122049 | 54028 | 101452 | 119896 | 53407 | 99494 | 119896 | 53407 | 99494 |

The table investigates the association of debt maturity, measured in years, with the legal environment. The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category, in addition to the composite anti-self-dealing index, which represents the average of the ex ante and ex post private control of self-dealing measures according to Djankov et al. (2008b). This index ranges from 0 to 1; SizeGroup includes the quartile of firms' size (total assets in USD) in the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Controls for the logarithm of GDP per capita for a given year in each country, the logarithm of firm age and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

## Table 13: Debt Currency

| | (1) Debt in Local Currency % | (2) Arm's length Debt in Local Currency % | (3) Bank Debt in Local Currency % | (4) Debt in USD (As Foreign) % | (5) Arm's length Debt in USD (foreign)% | (6) Bank Debt in USD (foreign)% | (7) Debt in Local Currency % | (8) Debt in USD (As Foreign) % | (9) Debt in Local Currency % | (10) Debt in USD (As Foreign) % |
|---|---|---|---|---|---|---|---|---|---|---|
| French | -21.42** | -17.19*** | -4.21 | 20.24** | 5.97* | 13.76** | | | | |
| | (9.51) | (4.15) | (6.91) | (8.48) | (3.40) | (5.90) | | | | |
| German | 3.12 | -13.45*** | 17.98*** | -1.61 | 0.14 | -1.70 | | | | |
| | (4.08) | (2.73) | (5.06) | (3.57) | (0.82) | (2.79) | | | | |
| Scandinavian | -30.53*** | -10.70** | -21.35** | 13.45 | 2.50 | 10.80* | | | | |
| | (11.06) | (4.28) | (8.72) | (8.83) | (2.86) | (5.73) | | | | |
| anti self dealing Index | | | | | | | 0.21 | -0.17 | | |
| | | | | | | | (19.10) | (15.37) | | |
| SizeGroup=0 × anti self dealing Index | | | | | | | | | 9.02 | -7.56 |
| | | | | | | | | | (19.32) | (15.73) |
| SizeGroup=1 × anti self dealing Index | | | | | | | | | 10.05 | -8.14 |
| | | | | | | | | | (18.10) | (14.44) |
| SizeGroup=2 × anti self dealing Index | | | | | | | | | 5.57 | -4.61 |
| | | | | | | | | | (18.20) | (14.47) |
| SizeGroup=3 × anti self dealing Index | | | | | | | | | -3.39 | 2.80 |
| | | | | | | | | | (19.52) | (15.96) |
| log assets | -2.39* | 8.08*** | -11.03*** | 1.94 | 1.32 | 0.54 | -2.53 | 2.06 | -0.92 | 0.73 |
| | (1.38) | (2.17) | (1.14) | (1.35) | (0.92) | (0.43) | (1.60) | (1.53) | (1.71) | (1.73) |
| log age | 2.57* | 3.16*** | -0.96 | -2.37* | -0.24 | -2.10 | 1.67 | -1.56 | 1.70 | -1.58 |
| | (1.47) | (0.45) | (1.26) | (1.38) | (0.30) | (1.26) | (1.11) | (1.01) | (1.09) | (1.00) |
| Log GDP per capita | 11.62*** | 5.88*** | 5.49 | -10.54*** | -2.85*** | -7.60** | 15.75*** | -14.97*** | 14.75*** | -14.15*** |
| | (3.95) | (1.46) | (3.43) | (3.65) | (1.06) | (3.10) | (4.75) | (4.40) | (4.81) | (4.43) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q |
| Cluster | C | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.230 | 0.381 | 0.379 | 0.234 | 0.093 | 0.194 | 0.192 | 0.214 | 0.197 | 0.218 |
| N | 121587 | 121587 | 121587 | 121692 | 121692 | 121692 | 119448 | 119553 | 119448 | 119553 |

The table investigates the association of debt currency, with the legal environment. The dependent variables include the percentage of debt in the local currency, and the percentage of debt in USD as a foreign currency (so it is zero for US firms). The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category, in addition to the composite anti-self-dealing index, which represents the average of the ex ante and ex post private control of self-dealing measures according to Djankov et al. (2008b). This index ranges from 0 to 1; SizeGroup includes the quartile of firms' size (total assets in USD) in the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Controls for the logarithm of GDP per capita for a given year in each country, the logarithm of firm age and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

# A Appendix

## A.1 Variable Definitions

Table A1: Variable Description and Sources

| Variable | Description | Source |
|---|---|---|
| **Total Debt** | | |
| Arm's length debt | The variable represents the total outstanding amount of senior bonds and notes, subordinated bonds and notes, and commercial papers, expressed as a percentage of the total debt. This calculation is based on the identified debt instruments in eMAXX. Additionally, we have access to a total sum provided by Capital IQ. When mentioning the total sum from Capital IQ, we explicitly refer to it as CIQ_Arm's length debt. | eMAXX, Capital IQ, Worldscope, Compustat |
| Bank debt | The variable represents the total outstanding amount of term loans and drawn lines of credit, expressed as a percentage of the total debt. This calculation is based on the identified debt instruments in Dealscan. Additionally, we have access to a total sum provided by Capital IQ. We also utilized the total sum from Capital IQ to deduce the proportion of total allocated credit drawn in each quarter. When mentioning the total sum from Capital IQ, we explicitly refer to it as CIQ_Bank debt. | Dealscan, Capital IQ, Worldscope, Compustat |
| Loans Observed | The variable represents the outstanding amount of term loans recorded in Dealscan for a quarter, expressed as a percentage of the total debt. It is calculated by subtracting the installments paid up to the respective quarter from the total loan amount issued. In cases where repayment schedules are missing in Dealscan, we assumed a homogeneous repayment rate for loans to align with the total amount of term loans recorded in Capital IQ. If the sum of term loans in Dealscan is less than the total in Capital IQ, we assumed a bullet payment at maturity for loans with missing repayment schedules. | Dealscan, Capital IQ, Worldscope, Compustat |
| Lines Observed | The variable represents the outstanding amount of drawn lines of credit recorded in Dealscan for a quarter, expressed as a percentage of the total debt. We assumed a homogeneous drawing rate for all outstanding lines of credit relative to the total drawn amount indicated in Capital IQ. | Dealscan, Capital IQ, Worldscope, Compustat |

Continued

**Table A1 – Continued**

| Variable | Description | Source |
|---|---|---|
| Identified Instruments | The variable represents the sum of the outstanding amount of arm's length debt in eMAXX and bank debt in Dealscan, expressed as a percentage of the total debt. | eMAXX, Dealscan, Capital IQ, Worldscope, Compustat |
| Total Debt Ownership Observed | The variable represents the sum of the observed debt ownership of arm's length debt in eMAXX and bank debt in Dealscan, expressed as a percentage of the total debt. | eMAXX, Dealscan, Capital IQ, Worldscope, Compustat |
| Num Creditors | The variable represents the count of owners of arm's length debt in eMAXX and lenders in Dealscan. It's worth noting that the lenders in Dealscan are assumed to be different from the eMAXX bondholders, as banks typically do not appear in eMAXX. Additionally, we have excluded a few securitized tranches of loans from Dealscan that were also present in eMAXX. | eMAXX, Dealscan |
| Herfindahl of Creditors Ownership | The variable represents the sum of squared fractional holdings of total creditors. These fractions are calculated w.r.t. the total ownerships observed for the respective firm in a quarter. This variable are defined only if the observed ownerships accounts for at least 30% of total debt. | eMAXX, Dealscan |
| C1, C3, C5, C10 | The variable represents the ownership stake of the largest k creditors, where k is equal to 1, 3, 5, and 10, regardless of the type of debt instrument they hold. This stake is expressed as a percentage of the total ownerships observed for the respective firm in a quarter. These variables are defined only if the observed ownerships accounts for at least 30% of total debt. | eMAXX, Dealscan |
| Num to cross 10%, 20%, 30% | The variable represents the number of creditors needed to surpass the threshold of k% of the total ownerships observed, where k is equal to 10, 20, and 30. This calculation is irrespective of the type of debt instrument held by these creditors. These variables are defined only if the observed ownerships accounts for at least 30% of total debt. | eMAXX, Dealscan |
| Largest Creditor Type | The variable represents the institutional creditor type that appeared most frequently as the largest creditor of firm-quarter observations within a country. | eMAXX, Dealscan |
| Total Maturity of debt | The variable represents the weighted average maturity of all identified debt instruments, regardless of their type. Maturities are measured in years (365 days), and weights are determined by the USD equivalent of the outstanding amount of debt instruments. | eMAXX, Dealscan |

Continued

**Table A1 – Continued**

| Variable | Description | Source |
|---|---|---|
| Total Secured Debt % | The variable represents the percentage of total debt mentioned as secured in Capital IQ. | Capital IQ |
| Local Currency % | The variable represents the percentage of total debt issued in the local currency of the firm's registered address. | Capital IQ |
| USD, EUR, GBP, JPY, CAD, AUD, NZD , NOK, SEK, CHF, Other Currencies % | The variable represents the percentage of total debt issued in USD, EUR, GBP, JPY, CAD, AUD, NZD, NOK, SEK, CHF, or other currencies. | Capital IQ, Worldscope, Compustat |
| **Arm's Length Debt** | | |
| Bonds Avg size USD m | The variable represents the average size of the outstanding amount of arm's length debt instruments with a positive amount outstanding in a quarter, measured in USD millions. | eMAXX |
| Bonds Outstanding PAR % of Total Debt | The variable represents the outstanding amount of arm's length debt as a percentage of the total debt. This is equivalent to the variable arm's length debt defined earlier. | eMAXX, Worldscope, Compustat |
| Bond Ownership Observed % of Outstanding PAR | The variable represents the percentage of the total outstanding amount of bonds in a quarter that we observe ownership of in our sample. | eMAXX |
| Num of Bond Issues | The variable represents the number of arm's length debt instruments with a positive amount outstanding in a quarter. | eMAXX |
| Num of Bondholders | The variable represents the number of distinct owners of arm's length debt instruments of a firm in a quarter, regardless of their stake size. | eMAXX |
| Herfindahl of Bondholders Ownership | The variable represents the sum of squared fractional holdings of total owners of arm's length debt. These fractions are calculated w.r.t. the total ownerships observed of all identified arm's length debt instruments in eMAXX. This variables are defined only if the observed ownerships accounts for at least 30% of total outstanding amount of arm's length debt. | eMAXX |

Continued

**Table A1 – Continued**

| Variable | Description | Source |
|---|---|---|
| C1, C3, C5, C10 | The variable represents the ownership stake of the largest k owners of arm's length debt, where k is equal to 1, 3, 5, and 10, regardless of the instrument they hold. This stake is expressed as a percentage of the total ownerships observed of all identified arm's length debt instruments in the respective quarter. These variables are defined only if the observed ownerships accounts for at least 30% of total outstanding amount of arm's length debt. | eMAXX |
| Num to cross 10%, 20%, 30% | The variable represents the number of arm's length creditors needed to surpass the threshold of k% of the total ownerships observed, where k is equal to 10, 20, and 30. This calculation is irrespective of the type of debt instrument held by these creditors. These variables are defined only if the observed ownerships accounts for at least 30% of total outstanding amount of arm's length debt. | eMAXX |
| Largest Bondholder Type | The variable represents the institutional type of arm's length creditors that appeared most frequently as the largest arm's length creditor of firm-quarter observations within a country. | eMAXX |
| Maturity of arm's length debt | The variable represents the weighted average maturity of all identified arm's length debt instruments. Maturities are measured in years (365 days), and weights are determined by the USD equivalent of the outstanding amount of arm's length debt instruments. | eMAXX |
| Arm's length Secured Debt % | The variable represents the percentage of total arm's length debt mentioned as secured in Capital IQ. | Capital IQ |
| **Bank Debt** | | |
| Num of Tranches (loans & lines) | The variable represents the number of term loans and lines of credit with a positive amount outstanding in a quarter. | Dealscan |
| Num of Loans | The variable represents the number of term loans with a positive amount outstanding in a quarter. | Dealscan |
| Num of Lines of Credit | The variable represents the number of lines of credit with a positive amount outstanding in a quarter. | Dealscan |
| Num Lenders | The variable represents the number of all distinct lenders that hold a positive fraction of Dealscan tranches with a positive amount outstanding in a quarter. | Dealscan |

Continued

**Table A1 – Continued**

| Variable | Description | Source |
|---|---|---|
| Num Lead Arrangers | The variable represents the number of all distinct lead arrangers of Dealscan tranches with a positive amount outstanding in a quarter. | Dealscan |
| Herfindahl of Lenders Amounts | The variable represents the sum of squared fractional holdings of total owners of bank debt. These fractions are calculated w.r.t. the total outstanding amount of all identified bank debt instruments in Dealscan. | Dealscan |
| C1, C3, C5, C10 | The variable represents the ownership stake of the largest k lenders of bank debt, where k is equal to 1, 3, 5, and 10, regardless of the instrument they hold. This stake is expressed as a percentage of the total outstanding amount of all identified bank debt instruments in the respective quarter. | Dealscan |
| Num to cross 10%, 20%, 30% | The variable represents the number of bank lenders needed to surpass the threshold of k% of the total bank ownerships observed, where k is equal to 10, 20, and 30. This calculation is irrespective of the tranche type held by these lenders. | Dealscan |
| Largest Lender Type | The variable represents the institutional type of bank creditors that appeared most frequently as the largest bank creditor of firm-quarter observations within a country. | Dealscan |
| Maturity of bank debt | The variable represents the weighted average maturity of all identified bank debt instruments. Maturities are measured in years (365 days), and weights are determined by the USD equivalent of the outstanding amount of all bank debt instruments. | Dealscan |
| Bank Secured Debt % | The variable represents the percentage of total bank debt mentioned as secured in Capital IQ. | Capital IQ |
| **Country Measures** | | |
| Ex Ante Control Index | The ex ante private control of self-dealing index, ranging from 0 to 1, encompasses (i) disclosures by the buyer and seller, and (ii) requirements for a positive independent review of the transaction and approval by disinterested shareholders. | Djankov et al. (2008b) |
| Ex Post Control Index | The ex post private control of self-dealing index, ranging from 0 to 1, captures (i) post-transaction legal provisions for holding the buyer and seller liable for bad faith, (ii) shareholders' ability to sue or rescind the transaction, (iii) shareholders' ability to access evidence on the transaction, and (iv) disclosure of evidence in periodic filings. | Djankov et al. (2008b) |
| Anti self dealing Index | The variable represents the average of the ex ante and ex post control indexes, which ranges from 0 to 1. | Djankov et al. (2008b) |

Continued

**Table A1 – Continued**

| Variable | Description | Source |
|---|---|---|
| Public Enforcement Index | The variable represents the disclosure requirements for self-dealing transactions by managers and controlling shareholders, ranging from 0 to 1. | Djankov et al. (2008b) |
| Creditor Rights Index | The creditor rights index ranges from 0 to 4. A score of 1 is assigned for each of the following secured lenders' rights defined in laws and regulations: (i) restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization, (ii) the ability of secured creditors to seize their collateral after the reorganization petition is approved (i.e., no automatic stay or asset freeze), (iii) the priority of secured creditors in being paid first out of the proceeds of liquidating a bankrupt firm, and (iv) management's loss of administration of the property pending the resolution of the reorganization. This index is derived from Djankov et al. (2007), who extend, revise, and update the original index compiled by La Porta et al. (1997, 1998). | Djankov et al. (2007) |

## A.2 Appendix Tables

Table A2: Country Level Measures

| Country | Creditor Rights | Ex Ante Control Index | Ex Post Control Index | Anti Self-dealing Index | Public Enforcement Index | Bankruptcy Efficiency Index |
|---|---|---|---|---|---|---|
| Australia | 3.00 | 0.89 | 0.62 | 0.76 | 0.50 | 87.80 |
| Bermuda | . | . | . | . | . | . |
| Canada | 1.00 | 0.33 | 0.95 | 0.64 | 1.00 | 93.20 |
| Cayman Islands | . | . | . | . | . | . |
| Guernsey | . | . | . | . | . | . |
| Hong Kong | 4.00 | 1.00 | 0.93 | 0.96 | 0.00 | 88.30 |
| India | 2.00 | 0.33 | 0.82 | 0.58 | 0.50 | . |
| Ireland | 1.00 | 0.78 | 0.80 | 0.79 | 0.00 | 89.90 |
| Israel | 3.00 | 0.50 | 0.95 | 0.72 | 1.00 | 66.20 |
| Jersey | . | . | . | . | . | . |
| Malaysia | 3.00 | 1.00 | 0.90 | 0.95 | 1.00 | 48.40 |
| New Zealand | 4.00 | 1.00 | 0.90 | 0.95 | 0.00 | 90.70 |
| Pakistan | 1.00 | 0.17 | 0.65 | 0.41 | 0.75 | . |
| Qatar | . | . | . | . | . | . |
| Saudi Arabia | 3.00 | . | . | . | . | 40.60 |
| Singapore | 3.00 | 1.00 | 1.00 | 1.00 | 1.00 | 96.10 |
| South Africa | 3.00 | 1.00 | 0.62 | 0.81 | 0.00 | 39.80 |
| Thailand | 2.00 | 1.00 | 0.62 | 0.81 | 0.00 | 54.90 |
| United Arab Emirates | 2.00 | . | . | . | . | 21.80 |
| United Kingdom | 4.00 | 1.00 | 0.90 | 0.95 | 0.00 | 92.30 |
| United States | 1.00 | 0.33 | 0.97 | 0.65 | 0.00 | 85.80 |
| **English Common Law** | **2.50** | **0.74** | **0.83** | **0.79** | **0.41** | **71.13** |
| Denmark | 3.00 | 0.25 | 0.68 | 0.46 | 0.75 | 76.70 |
| Finland | 1.00 | 0.14 | 0.78 | 0.46 | 0.00 | 92.40 |
| Norway | 2.00 | 0.42 | 0.42 | 0.42 | 1.00 | 91.80 |
| Sweden | 1.00 | 0.17 | 0.50 | 0.33 | 1.00 | 86.00 |
| **Scandinavian Civil Law** | **1.75** | **0.24** | **0.59** | **0.42** | **0.69** | **86.73** |
| Austria | 3.00 | 0.00 | 0.42 | 0.21 | 1.00 | 78.00 |
| China | 2.00 | 1.00 | 0.53 | 0.76 | 0.00 | 43.60 |
| Germany | 3.00 | 0.14 | 0.42 | 0.28 | 1.00 | 57.00 |
| Japan | 2.00 | 0.22 | 0.78 | 0.50 | 0.00 | 95.50 |
| Poland | 1.00 | 0.25 | 0.33 | 0.29 | 1.00 | 67.70 |
| South Korea | 3.00 | 0.25 | 0.69 | 0.47 | 0.50 | 88.10 |
| Switzerland | 1.00 | 0.08 | 0.45 | 0.27 | 0.75 | 60.40 |
| Taiwan | 2.00 | 0.42 | 0.71 | 0.56 | 0.00 | 93.80 |
| **German Civil Law** | **2.12** | **0.30** | **0.54** | **0.42** | **0.53** | **73.01** |
| Argentina | 1.00 | 0.33 | 0.35 | 0.34 | 0.00 | 35.80 |
| Belgium | 2.00 | 0.39 | 0.70 | 0.54 | 0.50 | 90.80 |
| Brazil | 1.00 | 0.22 | 0.33 | 0.27 | 0.50 | 13.40 |
| Chile | 2.00 | 0.50 | 0.75 | 0.62 | 1.00 | 40.90 |
| Colombia | 0.00 | 0.83 | 0.31 | 0.57 | 0.00 | 64.80 |
| France | 0.00 | 0.08 | 0.68 | 0.38 | 0.50 | 54.10 |
| Greece | 1.00 | 0.08 | 0.35 | 0.22 | 0.50 | 53.80 |
| Indonesia | 2.00 | 0.81 | 0.50 | 0.65 | 0.00 | 25.10 |
| Italy | 2.00 | 0.17 | 0.68 | 0.42 | 0.00 | 45.30 |
| Kuwait | 3.00 | . | . | . | . | 55.90 |
| Luxembourg | . | 0.17 | 0.40 | 0.28 | 1.00 | . |
| Mexico | 0.00 | 0.19 | 0.15 | 0.17 | 0.50 | 72.60 |
| Netherlands | 3.00 | 0.06 | 0.35 | 0.20 | 0.00 | 94.90 |
| Oman | 0.00 | . | . | . | . | 53.50 |
| Peru | 0.00 | 0.25 | 0.65 | 0.45 | 0.25 | 41.80 |
| Philippines | 1.00 | 0.06 | 0.38 | 0.22 | 0.00 | 17.50 |
| Russia | 2.00 | 0.81 | 0.07 | 0.44 | 1.00 | 39.00 |
| Spain | 2.00 | 0.22 | 0.53 | 0.37 | 1.00 | 82.00 |
| Turkey | 2.00 | 0.33 | 0.53 | 0.43 | 0.00 | 6.60 |
| **French Civil Law** | **1.33** | **0.32** | **0.45** | **0.39** | **0.40** | **49.32** |
| **World** | **1.91** | **0.45** | **0.61** | **0.53** | **0.45** | **63.97** |

This table presents the country level measures of legal environment if different countries. Please discuss Table A.1 for definitions.

Table A3: Creditor Concentration- C10

| | (1) C10 Creditors | (2) C10 Arm's | (3) C10 Bank | (4) C10 Creditors | (5) C10 Arm's | (6) C10 Bank | (7) C10 Creditors | (8) C10 Arm's | (9) C10 Bank |
|---|---|---|---|---|---|---|---|---|---|
| French | 7.40*** | 4.86* | -0.70 | | | | | | |
| | (2.35) | (2.73) | (0.95) | | | | | | |
| German | 8.06** | 22.82** | -1.04 | | | | | | |
| | (3.91) | (9.76) | (2.18) | | | | | | |
| Scandinavian | 12.87*** | 10.92*** | 2.68*** | | | | | | |
| | (1.84) | (2.45) | (0.37) | | | | | | |
| anti self dealing Index | | | | -8.36 | -8.16 | 2.08 | | | |
| | | | | (10.29) | (7.33) | (2.20) | | | |
| SizeGroup=0 × anti self dealing Index | | | | | | | -43.35*** | -3.53 | -11.35*** |
| | | | | | | | (9.86) | (14.17) | (4.14) |
| SizeGroup=1 × anti self dealing Index | | | | | | | -12.79 | 2.10 | -0.23 |
| | | | | | | | (9.72) | (8.92) | (3.30) |
| SizeGroup=2 × anti self dealing Index | | | | | | | -6.41 | -4.06 | 2.43 |
| | | | | | | | (9.13) | (8.18) | (2.47) |
| SizeGroup=3 × anti self dealing Index | | | | | | | -9.87 | -8.71 | 1.60 |
| | | | | | | | (10.88) | (7.72) | (2.31) |
| log assets | -11.20*** | -10.61*** | -4.77*** | -11.58*** | -10.72*** | -4.71*** | -12.52*** | -9.90*** | -5.23*** |
| | (1.53) | (0.19) | (0.45) | (1.31) | (0.11) | (0.42) | (0.84) | (0.37) | (0.40) |
| log age | -1.25*** | 0.00 | 0.43** | -0.76* | 0.11 | 0.42** | -0.63 | 0.16 | 0.46** |
| | (0.30) | (0.23) | (0.19) | (0.45) | (0.17) | (0.18) | (0.44) | (0.18) | (0.18) |
| Log GDP per capita | -1.90* | -3.62 | 0.79 | -3.53*** | -6.38*** | 1.07** | -3.16** | -6.76*** | 1.27** |
| | (0.97) | (2.19) | (0.48) | (1.23) | (1.54) | (0.51) | (1.55) | (1.67) | (0.48) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q |
| Cluster | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.571 | 0.570 | 0.250 | 0.563 | 0.557 | 0.248 | 0.579 | 0.560 | 0.256 |
| N | 122049 | 46841 | 101452 | 119896 | 46474 | 99494 | 119896 | 46474 | 99494 |

The table investigates the association of ownership dispersion, measured by the ownership stake of largest ten creditors, in their debt type (all, arm's length debt, or bank debt) with the legal environment. The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category, in addition to the composite anti-self-dealing index, which represents the average of the ex ante and ex post private control of self-dealing measures according to Djankov et al. (2008b). This index ranges from 0 to 1; SizeGroup includes the quartile of firms' size (total assets in USD) in the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Controls for the logarithm of GDP per capita for a given year in each country, the logarithm of firm age and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A4: Creditor Concentration- HHI

| | (1) HHI Total | (2) HHI Arm's | (3) HHI Bank | (4) HHI Total | (5) HHI Arm's | (6) HHI Bank | (7) HHI Total | (8) HHI Arm's | (9) HHI Bank |
|---|---|---|---|---|---|---|---|---|---|
| French | -0.00 | 0.01 | -0.02 | | | | | | |
| | (0.01) | (0.02) | (0.01) | | | | | | |
| German | -0.04 | 0.23** | -0.07* | | | | | | |
| | (0.04) | (0.10) | (0.04) | | | | | | |
| Scandinavian | 0.04* | 0.01 | 0.05** | | | | | | |
| | (0.02) | (0.01) | (0.02) | | | | | | |
| anti self dealing Index | | | | 0.04 | -0.02 | 0.05 | | | |
| | | | | (0.04) | (0.04) | (0.04) | | | |
| SizeGroup=0 × anti self dealing Index | | | | | | | 0.41** | 0.48** | 0.43** |
| | | | | | | | (0.20) | (0.19) | (0.17) |
| SizeGroup=1 × anti self dealing Index | | | | | | | 0.20** | 0.15*** | 0.20*** |
| | | | | | | | (0.08) | (0.05) | (0.07) |
| SizeGroup=2 × anti self dealing Index | | | | | | | 0.05 | -0.01 | 0.06 |
| | | | | | | | (0.06) | (0.05) | (0.05) |
| SizeGroup=3 × anti self dealing Index | | | | | | | 0.03 | -0.02 | 0.04 |
| | | | | | | | (0.05) | (0.04) | (0.04) |
| log assets | -0.08*** | -0.03*** | -0.07*** | -0.08*** | -0.03*** | -0.07*** | -0.05*** | -0.02*** | -0.04*** |
| | (0.01) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) |
| log age | -0.00 | -0.00 | 0.00 | -0.00 | -0.00 | 0.00 | -0.00 | -0.00 | 0.00 |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Log GDP per capita | -0.00 | -0.02 | 0.01 | 0.00 | -0.04*** | 0.02 | -0.01 | -0.04*** | 0.01 |
| | (0.01) | (0.02) | (0.01) | (0.01) | (0.01) | (0.02) | (0.01) | (0.01) | (0.01) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q |
| Cluster | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.325 | 0.245 | 0.217 | 0.324 | 0.189 | 0.205 | 0.351 | 0.215 | 0.231 |
| N | 122049 | 46841 | 101452 | 119896 | 46474 | 99494 | 119896 | 46474 | 99494 |

The table investigates the association of ownership dispersion, measured by HerfindahlHirschman index in their debt type (all, arm's length debt, or bank debt) with the legal environment. The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category, in addition to the composite anti-self-dealing index, which represents the average of the ex ante and ex post private control of self-dealing measures according to Djankov et al. (2008b). This index ranges from 0 to 1; SizeGroup includes the quartile of firms' size (total assets in USD) in the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Controls for the logarithm of GDP per capita for a given year in each country, the logarithm of firm age and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A5: Leverage and Debt Composition 1

| | (1) Leverage | (2) Arm's length Debt % Total Assets | (3) Bank Debt % Total Assets | (4) Leverage | (5) Arm's length Debt % Total Assets | (6) Bank Debt % Total Assets | (7) Leverage | (8) Arm's length Debt % Total Assets | (9) Bank Debt % Total Assets |
|---|---|---|---|---|---|---|---|---|---|
| French | -0.00 | -5.02*** | 4.62** | | | | | | |
| | (0.02) | (1.65) | (1.80) | | | | | | |
| German | -0.04* | -6.69*** | 3.26*** | | | | | | |
| | (0.02) | (1.28) | (0.98) | | | | | | |
| Scandinavian | 0.02 | -4.77*** | 6.46*** | | | | | | |
| | (0.02) | (1.68) | (0.90) | | | | | | |
| anti self dealing Index | | | | -0.04 | 4.34 | -8.08** | | | |
| | | | | (0.05) | (6.81) | (3.35) | | | |
| SizeGroup=0 × anti self dealing Index | | | | | | | -0.08 | 10.58 | -17.21*** |
| | | | | | | | (0.07) | (6.46) | (3.29) |
| SizeGroup=1 × anti self dealing Index | | | | | | | -0.08 | 3.28 | -10.48*** |
| | | | | | | | (0.05) | (6.39) | (3.08) |
| SizeGroup=2 × anti self dealing Index | | | | | | | -0.04 | 4.50 | -7.41** |
| | | | | | | | (0.05) | (6.50) | (2.92) |
| SizeGroup=3 × anti self dealing Index | | | | | | | -0.05 | 4.41 | -8.50** |
| | | | | | | | (0.05) | (7.15) | (3.45) |
| log assets | 0.00 | 3.13*** | -3.26*** | 0.00* | 3.44*** | -3.42*** | -0.00 | 3.53*** | -3.73*** |
| | (0.00) | (0.50) | (0.44) | (0.00) | (0.35) | (0.36) | (0.00) | (0.29) | (0.34) |
| log age | -0.02*** | 0.62*** | -2.33*** | -0.02*** | 0.22 | -2.04*** | -0.02*** | 0.20 | -2.01*** |
| | (0.00) | (0.20) | (0.45) | (0.00) | (0.25) | (0.30) | (0.01) | (0.25) | (0.31) |
| Log GDP per capita | -0.00 | 2.12*** | -2.28** | 0.01 | 3.50*** | -2.94*** | 0.01 | 3.46*** | -2.80*** |
| | (0.01) | (0.63) | (1.05) | (0.01) | (1.05) | (0.78) | (0.01) | (1.28) | (0.82) |
| Fixed effects | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q | I & Q |
| Cluster | C | C | C | C | C | C | C | C | C |
| Sample | All | All | All | All | All | All | All | All | All |
| Adj. R2 | 0.160 | 0.285 | 0.263 | 0.152 | 0.269 | 0.258 | 0.154 | 0.271 | 0.261 |
| N | 122049 | 122049 | 122049 | 119896 | 119896 | 119896 | 119896 | 119896 | 119896 |

The table investigates the association of broad capital structure variables with the legal environment. Leverage is defined as the ratio of total debt to total assets. Other variables have clear definition in the column headers. The key explanatory variables include legal origin indicator variables, which take the value of 1 for French civil-law, German civil-law, and Scandinavian civil-law countries, respectively, with common-law legal origin serving as the omitted category, in addition to the composite anti-self-dealing index, which represents the average of the ex ante and ex post private control of self-dealing measures according to Djankov et al. (2008b). This index ranges from 0 to 1; SizeGroup includes the quartile of firms' size (total assets in USD) in the population of firms in that country. All specifications incorporate industry fixed effects using two-digit SIC classifications and year × quarter fixed effects. Controls for the logarithm of GDP per capita for a given year in each country, the logarithm of firm age and the logarithm of total assets in USD are included in all specifications. The constant term is not reported. Detailed variable definitions and sources can be found in Appendix Section A.1. Heteroskedasticity-adjusted standard errors, clustered at the country level, are reported in parentheses below the estimates. Symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

## A.3 Data preparation

### A.3.1 Firm Identifiers

Firm information within our sample is sourced from four primary databases: Capital IQ, Worldscope, Compustat, and Amadeus. These databases utilize different firm identifiers: companyid for Capital IQ, Worldscope Permanent Identifier for Worldscope, GVKEY for Compustat, and IDNR for Amadeus. Of these, Capital IQ stands out as the most comprehensive dataset, and its companyid serves as our primary firm identifier. Therefore, we try to find links between companyid and the local identifiers of the other three datasets. Below, we outline the steps taken to merge each of these datasets with Capital IQ:

**Capital IQ.** Among the three sources of balance sheet information in our dataset, merging companyid with Compustat proves the simplest, facilitated by both being part of S&P Global, with a linking table provided directly by Capital IQ. The merge between Capital IQ and Amadeus, while challenging in practice, is straightforward to describe due to its predominantly manual hand-matching nature. Detailed procedures for these two mergers of datasets are elaborated below. However, the merge between Worldscope (from Refinitiv environment) and Capital IQ (from S&P Global) presented notable complexities. Despite both being reputable data providers, their distinct environments necessitated a more intricate merging process. The problem arises from Worldscope permanent identifier not appearing anywhere else than Worldscope. There is also not much hope in merging on public identifiers such ISIN and CUSIP directly because many firms in our sample either don't have them or don't have a unique value for them. As a result, we have to find global linking tables between S&P Global and Refinitiv environments.

The unique identifier common across all datasets within Refinitiv is known as PermID[14][15]. PermID serves as a comprehensive identifier for various entity types, including organizations, instruments, funds, issuers, and individuals. It remains unchanged and ensures unambiguous referencing, making it highly suitable as a universal identifier. PermID plays a central role in Refinitiv's information model and knowledge graph[16].

Our primary use of PermID is to merge Capital IQ with Worldscope, as detailed below. Additionally, having PermID facilitates the merging of firm data with debt ownership data in Dealscan (which now includes PermID in its revamped version) and eMAXX (for which

[14] Although sometimes PermID is not readily available in some Refinitiv datasets, as is the case with Worldscope, and needs to be retrieved separately using Refinitiv APIs or desktop products.

[15] See all details in https://permid.org/

[16] LSEG completed the acquisition of Refinitiv from its previous owners in late January 2021, and Refinitiv now operates as a subsidiary of LSEG. While some products of Refinitiv have undergone name changes since our original use, we continue to refer to them as Refinitiv to maintain clarity.

PermIDs are retrieved similarly to Worldscope using Refinitiv Python APIs) which are both products of Refinitiv, as outlined in Appendix Section A.3.2.

There is no direct linkage between companyids in Capital IQ and PermIDs in the Refinitiv environment. To bridge this gap, we extensively utilize local linking tables provided in WRDS for each dataset. These tables detail the identifiers of instruments (such as bonds and stocks) associated with each firm. Specifically, we leverage the following linking tables from Capital IQ[17]:

1. *wrds_isin.sas7bdat*: Lists all ISINs associated with a companyid, including start and end dates of the linkage, and company names.

2. *wrds_cusip.sas7bdat*: Provides all CUSIPs and CINSs associated with a companyid, along with start and end dates of the linkage, and company names.

In contrast, for Refinitv PermID, a direct linking table from standard identifiers (ISIN, CUSIP, etc.) to organization PermID does not exist and must be compiled using available Refinitiv files[18]:

1. *permisindata.sas7bdat*: Shows the PermID of the instrument associated with each ISIN, detailing the start and end date of the link.

2. *perminstrref.sas7bdat*: Links each instrument PermID to its organization's PermID.

Similar steps are repeated using *permcusipdata.sas7bdat* and *permcincusipdata.sas7bdat* to link CUSIPs and CINSs to firm PermID. This results in two tables linking standard identifiers (ISIN, CUSIP, CINS) to their respective firm PermID, akin to the tables found in Capital IQ.

In the final step, we merge the companyid-ISIN linking table with the PermID-ISIN linking table[19] to establish companyid-PermID links. This process is similarly applied to companyid-CUSIP/CINS links and PermID-CUSIP/CINS links to refine our initial companyid-PermID associations. Finally, cases where the companyid-PermID relationship is not one-to-one are filtered out.

[17]These linking tables are located in the following directories within the SAS version of WRDS files: /wrds/capitaliq/sasdata/helper.

[18]These files are found in the following directories within the SAS version of WRDS files: /wrds/tfn/sasdata/helper

[19]**Note:** At this stage, we are agnostic to the security types of ISINs or their existence in our debt instruments, aiming to maximize the number of links between Capital IQ and Refinitiv firm identifiers. Similarly, this approach applies to CUSIPs and CINS. Therefore, links may be established using, for example, stocks, even though our study focuses exclusively on debt instruments, primarily bonds and loans.

Following this procedure, out of 135,807 unique companyids in our Capital IQ dataset, we successfully identify PermIDs for 107,545 firms. This success rate is significant, with unmatched firms likely being smaller entities not covered by Refinitv PermIDs, which would not be included in our final sample anyway as our ownership data exclusively relies on Refinitiv products.

**Worldscope.** To compile a comprehensive dataset from Worldscope, we initially download all available observations covering the period 1998 to 2022, filtering out entries lacking a Worldscope Permanent Identifier or Date of Fiscal Period End. Subsequently, we exclude observations where the Entity Type is not designated as "C", indicating non-corporate entities, and remove entries with non-positive total assets. This refining process results in approximately 2.5 million quarterly observations.

The Worldscope Permanent Identifier, unique to Worldscope and not shared with other datasets, precludes its direct use for merging. However, leveraging Refinitiv's ecosystem, we utilize their APIs to retrieve PermID for Worldscope firms. Initially, we employ the *Eikon get_symbology* method, focusing on Worldscope Permanent Identifiers. For firms where PermID retrieval is unsuccessful in the first step, we extend the query to utilize ISIN, CUSIP, and SEDOL identifiers in Worldscope.

Combining these approaches ensures we obtain PermIDs for approximately 99.8% of Worldscope observations. The remaining small fraction, where PermIDs cannot be retrieved confidently, is subsequently omitted from our dataset. Ultimately the merge of Capital IQ with Worldscope is done using PermIDs and calendar quarters.

**Compustat.** Compustat and Capital IQ both belong to S&P Global, and a linking table between Capital IQ companyids and Compustat GVKEYs is directly provided by Capital IQ, which is also accessible in WRDS[20]. This table includes the start date and end date of the validity of these links as well.

To obtain the GVKEYs for our quarterly Capital IQ firm observations, we proceed with the following steps:

1. First, we merge our Capital IQ data with the linking table, using only companyids that are mapped to a unique GVKEY.

2. For companyids mapped to more than one GVKEY, we perform the merge again, this time taking into account the validity periods of the links.

[20]This linking table is called *wrds_gvkey.sas7bdat* and is located in the following directories within the SAS version of WRDS files: /wrds/capitaliq/sasdata/helper

Ultimately the merge between Capital IQ and Compustat is performed on the GVKEYs and calendar quarters.

**Amadeus.** Amadeus provides balance sheet information on European firms using a proprietary local identifier called IDNR, which is not compatible with other datasets. The only standard identifier in Amadeus is ISIN, which only sporadically adds firms to our sample that are not present already in Worldscope or Compustat. To enhance our sample coverage in Europe, we employ the following approach:

1. We utilize our Dealscan data, which includes PermID and GVKEYs[21] of borrowers, to identify European firms:

   - Whose PermID is not in Worldscope,
   - Either lack a GVKEY or have a GVKEY not in our Compustat data,
   - Whose PermID appears in our Capital IQ data.

   On one hand, these firms would not appear in our final dataset without using Amadeus, as their balance sheet information cannot be sourced from either Worldscope or Compustat. On the other hand, these firms have highest potential for inclusion in our study because their debt structure already exists in our Capital IQ data, and some debt ownership data for them exists in our Dealscan sample. We identify 1,063 such Dealscan borrowers.

2. We manually search for firm names online and in Amadeus and locate 572 out of the 1,063 firms in Amadeus.

3. For these 572 located firms in Amadeus, we fill in their PermID and merge Capital IQ with Amadeus using ISIN and then PermID. Although in general we only keep clean Capital IQ observation with detail breakdown of debt types, for this 572 firms in Amadeus we tolerate missing detail debt structure information in Capital IQ and we assume they are fully bank financed. However, exclusion of these 572 firms from our sample does not qualitatively or quantitatively affect the material findings of this study.

### A.3.2 eMAXX

eMAXX data reports institutional investors fixed-income holdings at the securities level. Based on the calendar date of bond ownership, this dataset is structured as separate stan-

[21] GVKEY of Dealscan borrowers are found using the table provided by Chava and Roberts (2008)

dalone folders for each quarter. The unit of observation in eMAXX is fund, so we pivot the date to achieve a dual format in which we observe different holder of each security in each quarter.

We begin by compiling a list of issue-level and issuer-level data from all the eMAXX folders available to us, retaining only the records pertaining to the corporate and asset-backed markets. Upon analysis, we observed that many entries regarding the par amount outstanding reported in eMAXX for corporate issues were outdated, as numerous securities had been partially or fully called before reaching maturity. Unfortunately, these updates were either not reflected in eMAXX or were significantly delayed. Since the par outstanding of bonds is a crucial piece of information for reconstructing the debt outstanding of bond-issuing firms, we addressed this issue by retrieving the time-series data of par outstandings for all eMAXX issues using the Refinitiv API and subsequently updating the information in eMAXX. At this stage, we are dealing with approximately half a million distinct CUSIPs in our dataset.

The next step, perhaps the most challenging aspect of working with eMAXX data, involves linking eMAXX issuers to other datasets containing firm information, such as Capital IQ, Worldscope, Compustat, and Amadeus. The only identifiers available in eMAXX for issuers are the 6-digit CUSIP and the firm name, both of which can be cumbersome to work with. Dealing with 6-digit CUSIPs can be challenging because a firm may be assigned multiple 6-digit CUSIPs over time, and handling firm names can be complicated due to potential variations in recording across datasets and the presence of overlapping or similar names. To tackle this challenge, we employ a three step solution: Firstly, we utilize the auxiliary Capital IQ linking tables available in the SAS studio version of WRDS, which provide historical changes in CUSIP-companyid and ISIN-companyid links. Secondly, we utilize auxiliary Thomson-Reuters files, also available in the SAS studio version of WRDS, which give us the PermID of the securities in eMAXX. Although these are only the PermIDs of the bond issues, they help us find the PermID of the issuer using the Refinitiv API. Lastly, for bond issues that still lack either the Capital IQ companyid or Refinitiv PermID, we attempt to find additional firm PermIDs by searching the issue CUSIP, ISIN, or CINS in the Refinitiv API, which occasionally provides us with extra firm PermIDs. We consider the aggregate of these three steps very successful, as only about 11% of our half a million CUSIPs remain unlinked to both Capital IQ companyid and Refinitiv PermID.

Identifying and consolidating ownership information of bond issues is a crucial aspect of this research. However, this task can become challenging when ownership stakes are reported using seemingly distinct identifiers. This issue of identifier duplicity is particularly common when different segments of the same debt instrument are traded in both the US

and Europe such as 144A and Regulation S bonds. Failing to establish these linkages could lead researchers to believe that eMAXX covers only a marginal portion of certain bonds' ownership, without realizing that another segment of bondholders for that same issue may be using an alternative identifier. To illustrate, consider a scenario where two distinct CUSIPs are associated with the same bond. In eMAXX holdings data, these identifiers might be observed with ownership percentages of $x_A$ and $x_B$ relative to the total par outstanding. In such cases, the correct percentage of observed ownership for this bond should be $x_A + x_B$. The reasons for the existence of such duplicate identifiers, the regulations surrounding them, and some examples are outlined in Section A.4. However, in the rest of this section, we elaborate on the methods for identifying and handling such duplicate issue identifiers.

To identify duplicating identifiers, we initially utilize the Refinitiv API to acquire the full list of identifiers for each bond issue in eMAXX. Among these identifiers, our focus is on CINS, ISIN, CUSIP, Corresponding 144A CUSIP, Corresponding 144A ISIN, Corresponding Regulation S CUSIP, and Corresponding Regulation S ISIN. For each security CUSIP in eMAXX, we meticulously compile a list of all potential other identifiers by examining not only the information provided for the respective CUSIP from the API, but also considering any other eMAXX CUSIPs that had this respective CUSIP as their potential duplicates.

After identifying the complete list of potential other identifiers, we set aside issues with only one unique identifier. For the remaining issues, we focus on bundles of two and three identifiers, as they are easier to resolve. Within these sets, we attempt to match a few simple cases. Many of these issues are privately placed bonds that are not initially eligible for trading by public American investors, at least for a certain period after the initial issue. A common scenario in this group is when a security is issued with separate 144A and Regulation S identifiers: the former for selling to American Qualified Institutional Buyers and the latter for selling to overseas (mostly European) investors. After a certain period, if the 144A security becomes qualified to be registered with the SEC, both the Registered and 144A versions may be entirely or partially exchanged for the Registered bond. To illustrate the issue, consider Table A6, which depicts the amount outstanding associated with a bond issued on September 30, 2009, by ACCO BRANDS CORP, with a total par outstanding of USD 460 million and a maturity date of March 15, 2015. This bond was partially sold under the Regulation S CUSIP (or CINS) U00445AB9 to overseas investors and partially sold under the 144A CUSIP 00081TAC2 to American Qualified Institutional Buyers (QIBs) and both of these issues were fully exchanged to CUSIP 00081TAD0 on May 14, 2010.

The issue that prompted us to identify and address the problems of duplicate bond issues is twofold: Firstly, if a researcher simply wants to determine the total par outstanding of bonds for ACCO BRANDS CORP in, for example 2009Q3, and they naively sum up all the

par values associated with different bond CUSIPs of this firm, he may arrive at a total greater than the balance sheet's total amount of outstanding bonds, as he fails to recognize that two seemingly different CUSIPs 00081TAC2 and U00445AB9 actually belong to the same bond. Secondly, and perhaps more importantly for our research, many funds in eMAXX continue reporting their holdings using the identifier by which they initially purchased the security, even if a new CUSIP and ISIN are assigned to their bond. By addressing this issue, if we observe a bondholder claiming ownership of CUSIP 00081TAC2 or U00445AB9 in quarters after 2010Q2, we would understand that they hold CUSIP 00081TAD0 in reality.

## A.4 Bond identifiers

### A.4.1 Regulations

A private placement is a type of securities offering made to a small group of selected investors rather than the general public. In a private placement, the securities are typically sold to institutional investors such as banks, insurance companies, hedge funds, and other large investors. Private placements are typically exempt from the registration requirements of the Securities Act of 1933, which means that issuers can avoid the time, cost, and regulatory burden of a public offering. Instead, issuers can negotiate the terms of the offering directly

Table A6: Example of Duplicate Identifiers - ACCO BRANDS CORP

| quarter | 00081TAD0 | 00081TAC2 | U00445AB9 |
|---|---|---|---|
| | Registered | 144A | Regulation S |
| 2009Q3 | 0 | 460 | 460 |
| 2009Q4 | 0 | 460 | 460 |
| 2010Q1 | 0 | 460 | 460 |
| 2010Q2 | 460 | 0 | 0 |
| 2010Q3 | 460 | 0 | 0 |
| 2010Q4 | 460 | 0 | 0 |
| 2011Q1 | 460 | 0 | 0 |
| 2011Q2 | 454.9 | 0 | 0 |
| 2011Q3 | 425.14 | 0 | 0 |
| 2011Q4 | 425.14 | 0 | 0 |
| 2012Q1 | 425.14 | 0 | 0 |
| 2012Q2 | 13.415 | 0 | 0 |
| 2012Q3 | 0 | 0 | 0 |

This table shows the amount outstanding associated with a bond issued on September 30, 2009, by ACCO BRANDS CORP, with a total par outstanding of USD 460 million and a maturity date of March 15, 2015 that had three associated Identifiers (CUSIPs.) The Identifiers and their type are shown for each bond along with their par outstanding in USD millions.

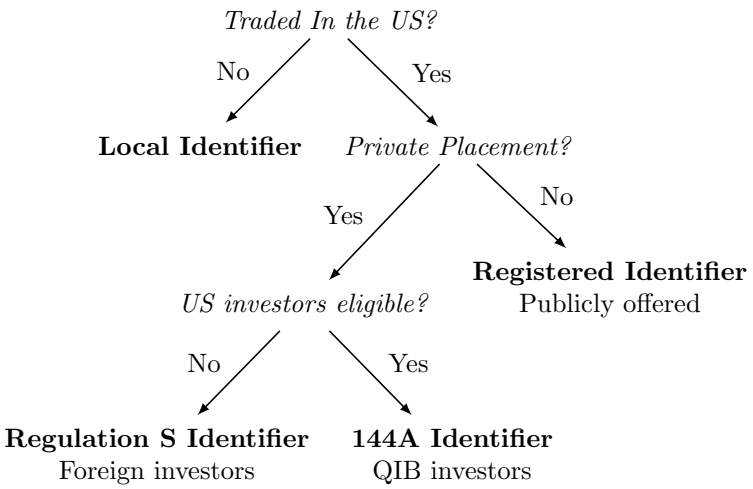



Figure A1: Bond Identifiers

with the investors, including the price, interest rate, maturity date, and other securities features.

In response to the rising internationalization of capital markets, the SEC issued Regulation S and Rule 144A in April 1990. Before 1990, few foreign corporations entered the US public debt markets because the SEC's registration and disclosure procedures were cumbersome. Meanwhile, the private debt market in the United States was essentially illiquid since investors had to keep assets for at least two years before reselling them. Regulation S and Rule 144A provided exceptions for this waiting time and SEC registrations, conditional on the buyers of these issues. The essential distinction between the two rules is found in their respective jurisdictions and geographical bounds. Regulation S oversees both domestic and international issuers' registration of offshore placements and offers a safe harbor for securities placement in non-US markets. It also permits these issues to be traded on various foreign markets. However, Rule 144A only applies to privately placed securities issued in the United States and sold to US Qualified Institutional Buyers (QIBs).

### A.4.2 Bond identifiers

To correctly group multiple identifiers of the same bond issue, the first step is understanding why some securities have multiple identifiers. Two following cases may result in a multiplicity of identifiers. First, when the name CUSIP (the 6-digit CUSIP, also referred to as issuer's CUSIP) of the issuer changes, so does the CUSIP and ISIN of its issues. For example, if company A acquires company B at time t, the outstanding bond issues of B will be exchanged for an equivalent outstanding issue from A, with a new identifier pointing to A.

Second, depending on the eligible investor universe, the same bond issue might have multiple ISINs. Figure A1 shows the most common cases in which multiple active identifiers can point to the same issue. A bond not traded in the US will have one unique local set of identifiers. If it is traded in the US without private placement (equivalently if this bond is publicly traded), then it has to be registered with SEC, and it will get a registered CUSIP. However, suppose it is traded in the US only through private placement. In that case, the set of assigned identifiers depends on whether it will be sold to US or foreign investors.

If one issue only fits in one of the four subgroups in Figure A1, the observed identifier in eMAXX uniquely identifies the issue with certainty. The complication arises when one issue falls into two or more subgroups simultaneously. For example, a privately placed issue under rule 144A can later be registered with SEC and offered to the public. If it happens, this issue will have one 144A ISIN and one registered ISIN. Section A.4.3 in Appendix lays down an example of such coupled securities, their accounting of their amount outstanding, and their identifiers for an example firm.

Regulation S securities can be offered in two ways: 1) as standalone Regulation S issues or 2) as concurrent Regulation S and Rule 144A offers, which differ in several respects. The investor base changes between the two segments: solo issues can only be offered to offshore investors, but combined issues can be sold to non-US offshore investors and US Qualified Institutional Buyers (QIBs). The main distinction is that the tranches of combined issues are subject to various jurisdictional limitations since offers outside the United States are subject to Regulation S, while those within the United States are subject to Rule 144A. The issuance and issuer features of the two types of issuances differ as well. Low credit grade issuers from the United States or nations geographically adjacent to the United States, such as Canada, Brazil, or Mexico, usually issue joint offerings. On the other hand, a typical solo issuance is often provided by a good credit quality issuer from a European country Li et al. (2021).

Crucially, security with both Regulation S and Rule 144A tranches is treated as one security in par value to prevent double-counting in databases and bond indices. In a similar manner, securities that originated under Rule 144A with registration rights and later registered with the SEC are treated as the same security for the treatment of the amount outstanding. We also address this issue by aggregating the bond ownership data in eMAXX.

### A.4.3 An example of coupled securities

Figure A2, taken from Refinitiv workspace, illustrates the common cases involving coupled securities for *American International Group*, henceforth AIG, as an example. Firstly, AIG has standalone Reg S (Maturity = 22 Nov 2047) and Rule 144A (maturity = 15 Mar 2046)

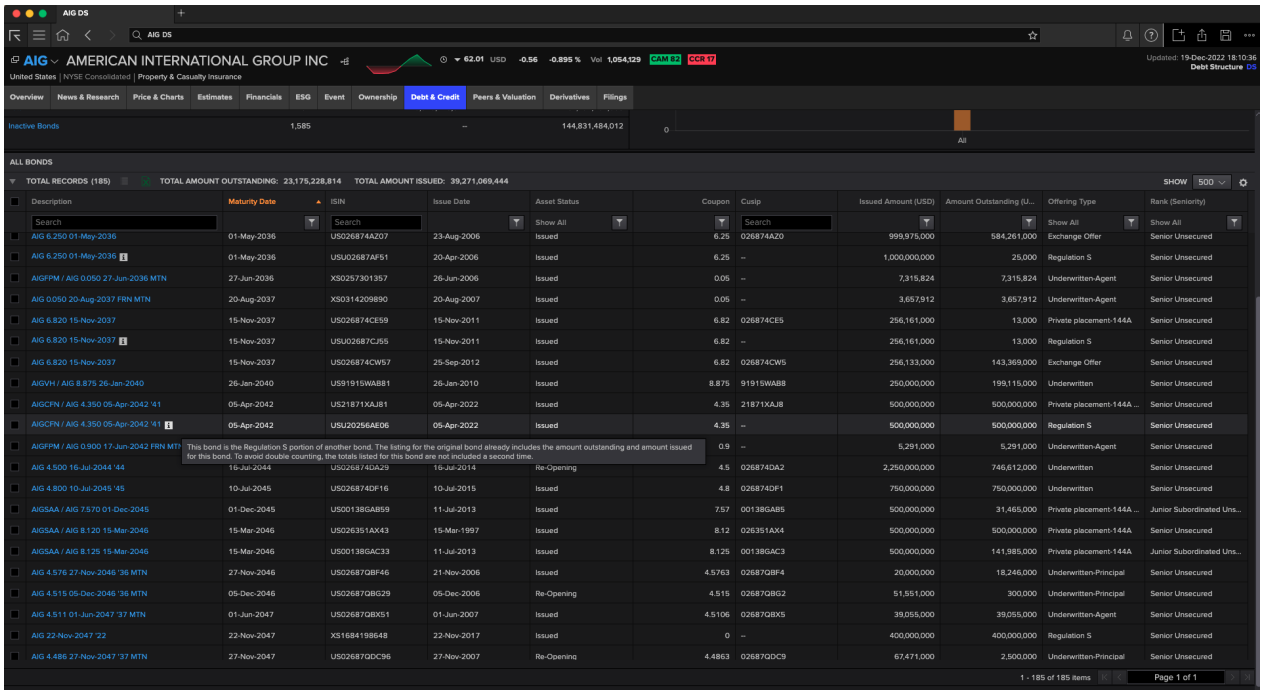



Figure A2: Some outstanding bonds of AIG

bonds whose par values are independently recorded. It has also several sets of combined Reg S and Rule 144A bonds (for instance, the two with maturity = 05 Apr 2042) whose par values are calculated collectively together, as you can read from the tip shown beside the pointer in the photo. Finally, it has also tranches of three bonds, a reg S, a 144A, and a public bond (the three bonds with maturity = 15 Nov 2037). In this case, the two reg S and 144A were issued in 2011 with a par amount of 256,161,000 USD. Then, in 2012, 256,133,000 USD of the total par was exchanged for public bonds, and 13,000 USD remained as it was. The announcement for this change was as follows:

| | | |
|---|---|---|
| 25-Sep-2012 | Asset | USD 256,133,000 exchanged to CUSIP 026874CW5 on 25-Sep-2012. AIG is offering to exchange these notes due November 15, 2037 for its outstanding Series A-1 and Series A-6 Junior Subordinated Debentures. |