Grant-in-Aid for Scientific Research (S)

Real Estate Markets, Financial Crisis, and Economic Growth

: An Integrated Economic Approach

Working Paper Series No.20

How Collateral Laws Shape Lending and Sectoral Activity

Charles W. Calomiris
Mauricio Larrain
José Liberti
and
Jason Sturgess

June, 2015

HIT-REFINED PROJECT
Institute of Economic Research, Hitotsubashi University
Naka 2-1, Kunitachi-city, Tokyo 186-8603, JAPAN
Tel: +81-42-580-9145
E-mail: hit-tdb-sec@ier.hit-u.ac.jp
http://www.ier.hit-u.ac.jp/ifn/

How Collateral Laws Shape Lending and Sectoral Activity[1]

Charles W. Calomiris, Mauricio Larrain, José Liberti, and Jason Sturgess

PRELIMINARY DRAFT

Abstract

This paper investigates the effect of cross-country differences in collateral laws regarding movable assets on lending and sectoral allocation of resources. Using micro-level loan data for a sample of emerging market countries we show that loan-to-values of loans collateralized with movable assets are on average 21 percentage points higher in countries with strong-collateral laws relative to immovable assets. Further, stronger collateral laws tilt collateral composition away from immovable to movable assets. We also provide evidence of a collateral class, including bank guarantees, for which enforcement is independent of collateral law. To examine the effect of collateral laws on real activity we map the relationship of collateral laws and collateral composition to asset-composition and sectoral resource allocation using industry-level output and employment data. Weak collateralization laws that discourage the use of movables assets as collateral create distortions in the allocation of resources that favor immovable-based production. The results shed light on an important channel – collateral laws – through which legal institutions affect lending and real economic activity.

[1] Calomiris: Columbia University and NBER, email: cc374@columbia.edu; Larrain: Columbia University, email: mlarrain@columbia.edu; Liberti: DePaul University, jliberti@depaul.edu; Sturgess: DePaul University, jsturge2@depaul.edu. We thank Emily Breza for helpful comments.

I.Introduction

The ability of creditors to enforce their contracts with debtors is fundamental to the market for credit. A debtor who cannot commit to repay her loan will find it difficult if not impossible to obtain one. Over the past two decades, scores of academic articles have demonstrated the validity and importance of creditors' rights for the supply of credit by showing how cross-country differences in the rights of creditors and reforms within countries that improve creditors' rights are associated with dramatic differences in the supply of bank credit. This literature has also documented a strong set of connections causally linking increases in credit supply produced by improvements in creditors' rights to faster economic growth, greater capital investment, more rapid technological progress, higher job creation, and better opportunities for social mobility. Such results have been documented with respect to differences in outcomes across countries, across regions within countries, within countries over time, and across industries.[2]

In this paper, we provide new evidence on one of the channels – collateral – through which law affects debt contracting, and in turn, credit supply and real economic activity. We explore how the sophistication of a country's collateral laws regarding movable assets affects loan supply, both as reflected in loan-to-value (LTV) and in the type of collateral pledged. We employ a novel cross-country data set containing small and medium business loans issued by an anonymous global bank (which we label GlobalBank) in twelve emerging market countries. One of the main advantages of the data set is that it provides information regarding the liquidation value of the asset being pledged as collateral. This allows us to construct comparable LTVs, using meaningful measures of asset value, for loans

[2] King and Levine (1993), Levine and Zervos (1998), La Porta et al. (1997, 1998), Taylor (1998), and Beck, Levine, and Loayza (2000) employed innovative statistical techniques to identify cross-country patterns. A later group of scholars—most notably Rajan and Zingales (1998), Wurgler (2000), Cetorelli and Gamberra (2001), Fisman and Love (2004), and Beck et al. (2008)—focused on the development of industries as well as countries, and they reached the same conclusion: finance leads growth. Research focusing on the growth of regions within countries by Jayaratne and Strahan (1996), Black and Strahan (2002), Guiso, Sapienza, and Zingales (2004), Cetorelli and Strahan (2006), Dehejia and Lleras-Muney (2007), and Correa (2008) produced broadly similar results. These studies built on the theoretical and narrative insights of Goldschmidt (1933), Gurley and Shaw (1960), Gurley, Patrick and Shaw (1965), Goldsmith (1969), Shaw (1973), McKinnon (1973), and Fry (1988). There are also various articles focusing on how creditors' rights differences affect the structure of loans (size, maturity, lender concentration, the reliance on collateral), and the identity of lenders (domestic vs. foreign). See, for example, Demirguc-Kunt and Maksimovic (1998), Qian and Strahan (2007), Bae and Goyal (2009), Liberti and Mian (2010).

collateralized by different types of assets – something that the previous literature has been unable to do, due to the lack of data on asset liquidation values.

To examine the effect of collateral law on economic activity we connect differences in collateral law to differences in the composition of assets and production in the economy. Specifically, we analyze how collateral law affects the composition of assets (the ratio of immovable to movable assets) and the sectoral allocation in production between movables-intensive and immovables-intensive producers using industry-level output and employment data for 86 countries.

In theory, collateral plays five separate roles in efficient debt contracting. First, in the event of a default, secured creditors who are able to seize collateral can recover what is owed to them with lower enforcement costs than an unsecured creditor, who must await the adjudication of his claims in a bankruptcy court. Second, the use of collateral clarifies the respective claims of creditors and thereby can reduce the physical costs of a bankruptcy proceeding. Third, the possession of a security interest can improve the bargaining position of creditors when a debtor becomes financially distressed, and result in a higher probability of efficient renegotiation and greater exertion of effort by debtors contingent on distress. Fourth, at the time of debt contracting, the use of collateral can mitigate information costs because the willingness to offer collateral provides a credible positive signal about the unobservable quality of the debtor. Fifth, at the time of contracting, offering collateral can improve debtors' incentives to act in ways that are favorable to the interests of creditors.

To examine empirically the role collateral plays in debt contracting, we first investigate how the lending supply behavior of GlobalBank responds to differences in the quality of collateral protections for movable assets (such as equipment, machinery, accounts receivable, and inventory) across 12 of the emerging market countries in which it lends. For GlobalBank we observe the LTV and collateral type at the loan-level. Thus we are able to identify within-country differences in loan supply and LTV across loans collateralized with movable and immovable assets. Employing these within-country estimates

allows us to make meaningful comparisons across countries because the country fixed effects absorb other country-specific factors influencing collateral choice and the level of loan risk in an economy. We examine how these within-country differences in loan supply and LTV are affected by different legal treatments of movable collateral. We measure cross-country differences in the quality of movable collateral laws in those 12 countries using World Bank data from *Doing Business* to focus specifically on each country's legal treatment of movables as collateral. We show that LTVs for loans collateralized by movable assets are higher in countries with strong legal frameworks for movable collateral (which we label strong-law countries), but that there is no significance difference in LTVs for loans collateralized by immovable across strong- and weak-law countries. Examining our difference-in-differences estimates, in strong-law countries, LTVs of loans collateralized with movable assets are on average 21 percentage points higher than LTVs for loans collateralized by immovable assets, relative to the comparable difference in LTVs across movable and immovable assets in weak-law countries.

Next, to examine how the over-dependence on immovable assets as collateral in weak-law countries affects the sectoral allocation of financing, we examine how loan supply varies by industrial sector. We divide GlobalBank borrowers according to immovable asset-intensity (which we identify using U.S. sectoral asset compositions, which should be relatively free from distortions related to ineffective collateral laws for movables) to measure the supply of immovable collateral at the borrower-level. We document that immovable-backed loans are more common in almost all countries. However, movables-backed loans are relatively more prominent in strong-law countries than in weak-law countries. Further, the relative use of immovable-based lending in weak-law countries primarily reflects the greater use of immovable collateral in immovable asset-intensive sectors. We employ within-country estimations of the frequency of immovable collateral at the sector level, and show that the difference between the frequency of immovable-backed loans in sectors with high and low real-estate intensity is 8.4 percentage points lower in strong-law countries than in weak-law countries.

To investigate the consequences for real activity, we study how collateral law affects sectoral allocation for all firms, not just those that borrow from GlobalBank, using UNIDO data that provides each country's sector-specific output and employment for 36 sectors within manufacturing. As before, we measure exogenous immovable asset-intensity of each manufacturing sector using data for the U.S. sectoral composition of assets. We show that weak-law countries tend to unconditionally allocate greater output (and employment and number of establishments) towards immovable-intensive sectors relative to strong-law countries. Examining the within-country allocation of resources across collateral law frameworks, we find that weak-law countries allocate 15.4% more of their production to immovable-intensive sectors than strong-law countries. The effect is robust to controlling for other country-level characteristics, interacted with the real-estate sectoral indicator. Combined with the findings for loan-to-values and loan frequency, these results show that weak collateral laws for movable assets not only limit the ability of firms to raise financing, both on the extensive margin and on the intensive margin, but also skew financing and output towards industries naturally intensive in immovable assets.

We also consider a third category of GlobalBank lending in each country, which we label Supra collateral loans. These loans either are guaranteed and enforced outside of the borrowers' country or are collateralized by cash assets at the bank, and therefore, are effectively protected from default by the bank's right of setoff (the right to seize deposits if debt service is not paid). We find that the relatively low loan-to-value ratios for loans collateralized by movables in weak-law countries relative to strong-law countries is not observed for Supra collateral loans, due to their immunity against the effects of weak collateralization laws.

For most of the 12 countries in our lending sample, the legal framework relating to movables collateralization was fairly constant during our sample period. However, one of the countries – Slovakia – changed its collateralization framework for movables during our sample period. To provide further causal evidence on the relation between collateral law and debt contracting, we examine the lending behavior in Slovakia around the collateral law reform. Importantly, the reform allowed for the creation of security

interests over movable assets without having to transfer possession to the creditor, dramatically expanding the scope of assets that could be used as collateral. Examining collateral use both within-country and within-borrower, we find that LTVs for movables, relative to immovables, rose substantially after the policy reform, reducing the LTV spread between immovable and movable assets. Our within-country analysis of Slovakia also shows an increase in the use of movables collateral after the movables collateralization reform, although the increase is not statistically significant.

Overall, our results show that collateralization laws in emerging markets that discourage the use of movables assets as collateral create distortions in the allocation of resources that favor immovable-based production. The increase in both loan supply and loan-to-value ratios for loans with movable assets pledged as collateral in strong-law countries, vis-à-vis weak law countries, suggests a channel through which stronger collateral laws allow economies to expand credit to all production possibilities.

Our results reinforce previous findings regarding the importance of collateral, and collateral laws, for bank lending. According to the World Bank *Enterprise Surveys*, which are performed in over 100 countries, collateral is required for bank loans in 75% of loans worldwide.[3] Moreover, the lack of collateral is one of the primary reasons for the rejection of credit (Fleisig et al., 2006). Understanding the effects of movable collateral laws on production is particularly important given that 78% of developing countries' capital is in movable assets, and only 22% is in immovable assets (Alvarez de la Campa, 2011).

Although we are the first to analyze the link between collateral laws, lending supply, and asset allocation, a number of papers investigate how cross-country differences in the supply of credit is explained by the existence and enforcement of secured creditors' rights, especially with respect to collateralization.[4] Liberti and Mian (2010) show that collateral is a binding constraint on lending, and that

[3] To access the surveys see http://www.enterprisesurveys.org/ (cited in Love, Martínez Peria and Singh, 2013).

[4] There are also large theoretical and empirical literatures on the role of collateral in loan contracting, which we do not review in detail here, including Lacker (2001), Bester (1985), Chan and Thakor (1987), Berger and Udell (1990), Boot and Thakor (1994), Rajan and Winton (1995), Gorton and Kahn (2000), Longhofer and Santos (2000), John et al. (2003), Djankov et al. (2003), Benmelech et al. (2005), Jimenez et al. (2006), Gan (2007), Djankov et al. (2008), Amedeo (2009), Ono and Uesugi (2009), Benmelech (2009), Benmelech and Bergman (2009, 2011), Berger

this constraint tends to bind more in relatively underdeveloped financial markets. Cerqueiro, Ongena and Roszbach (2014) study the effect of a 2004 Swedish law that exogenously reduced the value of collateral. They find that, even in a country as developed as Sweden, this change produced increases in interest rates on loans, tightened credit limits, reduced investments in monitoring collateral values and borrowers, and higher delinquency rates on loans. Haselman, Pistor and Vig (2009) show in their study of legal reforms in Eastern Europe's transition economies that changes in collateral laws mattered more for the supply of credit than changes in bankruptcy laws.

Our paper is closest in spirit to Campello and Larrain (2014), who provide a detailed case study of the Romanian legal reforms that permitted movable assets to be pledged as collateral. They show that the reform broadened access to credit, particularly for firms that were making intensive use of movable capital, resulting in a sharp increase in the employment and capital stock share of movables-intensive firms. In this paper, we present evidence that corroborates their findings on access to credit using micro-level data for a much larger sample of countries. Thus we are able to uncover the mechanism through which collateral law affects debt contracting, and confirm that this mechanism is broadly applicable to collateral reform. Furthermore, we show that not only do legal impediments to collateralizing movables distort lending, they also result in substantial production distortions.

Our paper also contributes to the broader literature that examines the different aspects of creditors' rights. Differences in creditors' rights can reflect alternative bankruptcy rules (e.g., the rules governing reorganization vs. liquidation), differences in the rights of secured vs. unsecured creditors, different protections for various types of security interests (in real estate vs. movable assets), differences in the ways collateral rights are enforced, and differences in the extent to which the judicial system enforces these rules impartially and expeditiously. For example, Jappelli et al. (2005), Chemin (2010) and

---

et al. (2011, 2013), Godlewski and Weill (2011), Chaney, Sraer and Thesmar (2012), Rampini and Viswanathan (2013), and Campello and Giambona (2013). Some recent work has qualified some of the earlier discussions of the effects of collateral rights by showing that increases in creditors' rights to collateral that reduce debtors' bargaining power – particularly with respect to the disposition of collateral – can reduce the amount of lending through contractions in demand, even when the supply of lending increases (Lilienfeld-Toal et al. 2012 and Vig 2013).

Ponticelli (2013) show that the way rights are enforced, or not, by courts can be as important as the existence of rights as a matter of law. The role of collateral in lending has been particularly emphasized in the literature, and the effects of changes in the creation and enforcement of collateral rights have figured prominently in the discussion of the effects of creditors' rights. Collateral is central to debt contracting and therefore the legal institutions that define enforcement of collateral provisions in debt contracts is a key aspect of creditors' rights.

The remainder of the paper is organized as follows. Section II discusses our data sources. Section III reports empirical findings related to GlobalBank's lending in 12 emerging market countries. Section IV provides additional evidence on supra-collateral, the reform in Slovakia, and robustness checks. Section V examines the effects on the sectoral allocation of resources. Section VI concludes.

II. Data Sources

Our study employs data primarily from three sources: the detailed lending records of an anonymous global bank, the World Bank's *Doing Business* data (including components of those data that are not publicly available), and UNIDO data on countries' sectoral allocations of production.

GlobalBank provided data on the loans it makes to small and medium-sized enterprises (SMEs) during the years 2002-2004 in 16 emerging market countries. In our study, we included loans that are collateralized either by immovables (real estate assets) or by movables (equipment, machinery, inventory and accounts receivable). For clarity of comparison, loans collateralized by both types of collateral are excluded from our sample. Four of the 16 countries (Brazil, Korea, South Africa and Taiwan), however, had too few observations of collateralized loans to be included in our study and so we were left with data for 12 countries (Chile, Czech Republic, Hong Kong, Hungary, India, Malaysia, Pakistan, Romania, Singapore, Slovakia, Sri Lanka, and Turkey). We are unaware of the reason that collateralized lending by GlobalBank to SMEs is absent in Brazil, Korea, South Africa and Taiwan. It is possible that lending to those four countries by GlobalBank may occur via an alternative asset-based program within GlobalBank

that is not part of our dataset. Our total sample of loans collateralized either by movables or immovables for the 12 countries include 3,503 loans, 1,022 of which are collateralized by movables and 2,481 of which are collateralized by immovables. We include one loan per firm in our sample; if there are multiple loans per borrower we use the first observed loan.

We measure loans as the amount of the term loan or the amount actually drawn on a line of credit. The liquidation value of the pledged asset is defined as the market value of the collateral as appraised by GlobalBank. This is the realizable value to the bank if the collateral were sold at that particular point in time. This value does not include any discount due to asset fire sales or due to the presence of constrained buyers, as in Shleifer and Vishny (1992). In terms of the internal process, an independent assessor or appraiser determines the gross price that a willing and informed buyer would pay to a willing and informed seller when neither party is under pressure to conclude the transaction.[5]

In addition to the loan categories already mentioned, we also include another category of loans that we label Supra collateral loans, which adds another 469 loans to our sample, bringing the total sample to 3,972 loans. The Supra-collateral category includes loans collateralized by cash deposits or other cash assets placed in GlobalBank, or by foreign cash deposits, as well as loans backed by commercial letters of credit enforced abroad (related to import/export lending), or by stand-by letters of credit or other credit guarantees enforced outside of the borrowing firm's country.

Foreign deposits, local cash deposits, certificates of deposits and bonds are forms of cash asset collateral that enjoy the legal right of recoupment or set-off, which means that the bank effectively has immediate access to these forms of collateral without relying on collateral laws governing movable assets. Standby letters and other letters of credit or guarantees typically are provided by subsidiaries of GlobalBank in a foreign country or by other acceptable counterparty banks with good reputation and with which GlobalBank has daily operations. Letters of credit are regulated by the International Chamber of

[5]See Degryse et al. (2014) for an analysis of the relationship between the appraised value and the minimum recovery value that the bank estimates.

Commerce (ICC) and Uniform Customs and Practice for Documentary Credits (UCP), which control the terms of the letter of credit and the payment procedure for drawing upon it.

To measure differences across countries in strength of movable collateral laws, we turned to the World Bank's *Doing Business* dataset to construct an index that captures the ability to use assets effectively in loan contracts. The World Bank captures many different aspects of collateral laws through various components that it measures, and its staff kindly agreed to share those individual component measures for our sample of countries for the year 2005, which is the first year for which data are available.

The World Bank measures are based on a questionnaire administered to financial lawyers and verified through analysis of laws and regulations as well as public sources of information on collateral laws. *Doing Business* provides information on eight different features of collateral laws and gives each feature a 0/1 score. We construct a movables collateral law strength index (MC Law Index) for each country by summing the scores of seven of those components.[6] Thus, the MC Law Index ranges from 0 to 7. A score of 1 is assigned for each of the following features of the laws, each of which is important for the ability of creditors to use movable assets as loan collateral:

- The law allows a business to grant a non-possessory security right in a single category of movable assets, without requiring a specific description of the collateral.
- The law allows a business to grant a non-possessory security right in substantially all its movable assets, without requiring a specific description of the collateral.
- A security right may be given over future or after-acquired assets and may extend automatically to the products, proceeds or replacements of the original assets.

[6] Our results are qualitatively invariant to including the eighth component in our MC Law Index, but we do not do so because we believe that this component contains significant errors that make it a misleading indicator. The omitted component pertains to the following feature: "Any business may use movable assets as collateral while keeping possession of the assets, and any financial institution may accept such assets as collateral." We found that this variable almost always took the value of one in the database, and in the few cases where it took the value of zero (indicating a lack of movables collateralization law) we were aware that this coding was incorrect. Indeed, because almost all of the zeroes appear to be coding errors, this field is not correlated (and sometimes negatively correlated) with the other components of the score, which is further reason to doubt its veracity.

- A general description of debts and obligations is permitted in the collateral agreement and in registration documents; all types of debts and obligations can be secured between the parties, and the collateral agreement can include a maximum amount for which the assets are encumbered.
- A collateral registry or registration institution for security interests over movable property is in operation, unified geographically and by asset type, with an electronic database indexed by debtors' names.
- Secured creditors are paid first (for example, before tax claims and employee claims) when a debtor defaults outside an insolvency procedure.
- The law allows parties to agree in a collateral agreement that the lender may enforce its security right out of court.

For most countries in our GlobalBank loan sample, there are no major legal reforms occurring during our sample period. The exception is Slovakia, which passed a major reform of the collateralization of movables in late 2002. Slovakia introduced a new secured transactions law, based on the EBRD Model Law on Secured Transactions. Prior to the passage of the law, creditors in Slovakia mostly relied on fiduciary transfer of title to secure their obligations. The new law allowed the creation of security interests over movable assets without having to transfer possession to the creditor, dramatically expanding the scope of assets that could be used as collateral. The law also gave creditors private enforcement rights, including the ability to repossess collateral and dispose of it through private auctions. The law became effective on January 1st 2003, with the introduction of the Charges Register, a modern centralized registry for security interests over movable assets, operated by the Chamber of Notaries. A security interest could be registered in minutes at any local office through an electronic terminal for as little as 30 euros. The reform was considered a success and became the subject of numerous press accounts. Annual filings in the collateral registry increased from 7,508 in 2003 to 31,968 in 2007, a per annum increase of over 50 percent. In January 2003, *The Economist* went so far as to qualify the reformed Slovak secured transactions law as "the world's best rules on collateral."

In the results reported below, when we include Slovakia in the cross-sectional analysis of countries, we only include loan observations for the post-reform period. When we separately analyze the changes in lending behavior within Slovakia over time, we include the entire Slovakian sample, in order to measure the effect of the reform on movables lending.

Data by country on the industrial sector composition of output and employment come from the United Nations Industrial Development Organization's (UNIDO) Industrial Statistics dataset (INDSTAT-2). UNIDO provides yearly information for 22 two-digit manufacturing industries (ISIC revision 3) for a large number of countries for a large number of years. We use data on sectoral output (and also on employment), measured in US dollars. We construct a single cross-section, averaging data for the period 2002-2004. Data for Sri Lanka and Pakistan are not available from this data source. Thus, the sample constructed to coincide with our 12-countries consists of 220 observations corresponding to 10 countries and 22 industries.

We also report regression results on the industrial composition of output for a larger sample of countries, which include many countries other than the 10 that are in our GlobalBank database, Here, as before, we use the UNIDO data on industrial composition, and the World Bank data to construct our MC Law Index score for the countries included in this larger sample. In our regressions analyzing the industrial composition of output and employment, we employ additional macroeconomic controls, some derived from the World Bank's *World Indicators* database (GDP per capita, the relative tariff on manufacturing and primary sectors, and population density) and one (a rule-of-law measure) from the World Bank's *Worldwide Governance Indicators*.

III. Movable Asset Collateral Laws and GlobalBank's Lending

A. Intensive-Margin Analysis

For each of the 12 countries in our sample, Figure 1 plots the differences in the mean loan-to-value (LTV) ratios between GlobalBank loans collateralized by immovables and loans collateralized by movables. As the figure shows, loans collateralized by immovables tend to have higher average LTVs, and the greater the value of the MC Law Index score, the less the difference between the LTVs for loans collateralized by immovables and movables. This is consistent with the notion that a higher MC Law Index value (a greater

ability to collateralize movables) is associated with a greater supply of loans on the intensive margin for movables-collateralized loans, relative to immovables-collateralized loans.

[Insert Figure 1 here]

Table 1 shows that same pattern in a different way. Here we sort the 12 countries into two groups – above-median-MC Law Index score (Strong-Law) countries and below-median-MC Law Index score (Weak-Law) countries. We compute the average LTV ratios for each of the two collateralized loan types in each country, as well as the average for each of the two groups of countries. As Table 1 shows, LTV ratios on loans collateralized by immovables tend to be quite similar in weak-law and strong-law countries (0.815 for weak-law countries versus 0.910 for strong-law countries), but for loans collateralized by movable assets the average LTVs for the two groups are very different (0.443 versus 0.828). The spread in LTVs across immovable and movable collateral is 0.082 (=0.910-0.828) in strong-law countries and 0.372 (=0.815-0.443) in weak-law countries, with the difference across legal frameworks significant at the 1%-level. These patterns show that the ability to collateralize loans against immovable assets is similar across countries. However, the ability to collateralize loans against movable assets is dissimilar; in weak-law countries, the inability to collateralize using movable assets results in much lower LTVs for loans collateralized by movables.

[Insert Table 1 here]

In order to formally test the effect of collateral laws on LTVs, we run the following difference-in-differences estimation:

$$LT\diamondsuit_{i} = \alpha_{c} + \beta Law_{c} + \gamma Movable_{i} + \delta Law_{c} * Movable_{i} + \theta X_{i} + \varepsilon_{i},$$

where $LT\diamondsuit_{i}$ is the loan-to-value for a loan made to firm i and Law_c is a strong-law indicator variable that takes the value 1 if the country is above the median value of the MC Law Index score and 0 otherwise. We use an indicator variable to reduce measurement error, since we believe that the equally weighted

index may not be a precise indicator of the quality of collateral laws for movables.[7] $Movable_i$ is a movable indicator variable that takes the value 1 if the loan is collateralized by a movable asset and zero otherwise, and can be interpreted as collateral-type fixed effect. The specification includes a full set of country fixed

effects (α_c). We cluster standard errors at the country level. The coefficient of interest is δ, which is identified from the within-country variation across collateral types. The coefficient provides an estimate of the difference between LTVs of loans collateralized by movable and immovable assets in strong-law countries, relative to the difference in LTVs in weak-law countries. Finally, we include borrower-level characteristics to control for differences in the supply of collateral. X_i includes the bank's internal measure of firm size[8], the bank's internal risk rating, the ratio of net fixed assets-to-total assets, the ratio of cash-to-total assets (where cash is the sum of cash holdings and marketable securities), the ratio of accounts receivables-to-total assets, and profitability, measured by the ratio of EBITDA-to-Sales.

[Insert Table 2 here]

We report the effects of the legal regime on the LTVs of different types of loans in Table 2. Column (1) reports the results without including fixed effects; column (2) adds country fixed effects; and column (3) adds sector fixed effects. The *Law*Movable* interaction term is positive, statistically significant, and stable across all three specifications. According to the results of column (3), our preferred specification, the difference between the LTV of movable and immovable-collateralized loans is 21 percentage points higher in strong-law countries than in weak-law countries. The economic significance is large: compared with the unconditional mean LTV for movables in weak-law countries of 0.443, the results in column 3 represent an increase in LTV of 47.6% (=0.211/0.443). These results imply large loan-supply effects on the intensive margin that are associated with strong-law status, which are more pronounced for movables-collateralized loans.

[7] Our results are robust to using a continuous variable measuring the MC Law Index score and to dividing countries into finer categories, rather than above- and below-median levels of the MC Law Index (see Section IV.C).
[8] Firm size is an indicator variable that takes the value of 3, 2, 1 and 0, for firms with net sales >$25 million, <$25 million and >$5 million, <$5 million and >$1 million and <$1 million, respectively.

The results reported likely understate the degree to which loan supply is affected by movables collateral laws. Recall from Section I that, both in theory and in empirical studies of collateralized lending, the reliance on collateralized loans tends to be greatest for relatively young and small firms. It follows that the inability to employ movables collateral should make it particularly difficult for young, unseasoned firms to qualify for loans. In other words, in the absence of a good legal framework for collateralized lending against movable assets, the composition of borrowers is likely to shift toward more seasoned credit risks that are less dependent on collateral. For that reason, observed differences in LTVs will tend to be offset somewhat by unobservable contrary shifts in the quality of borrowers. That is, unobservably unseasoned borrowers receiving loans collateralized by movable assets will tend to be more present in strong-law countries. For that reason, the LTVs of movables-backed loans in weak-law countries will tend to be affected by the unobservable better fundamental credit risk, which acts to diminish the observed differences in LTVs on loans collateralized by movable assets for the two sets of countries reported in Table 2.[9] The same will hold for the extensive-margin results reported below.

B.Extensive-Margin Analysis

Figure 2 and Table 3 examine the extensive margin of loan supply. Figure 2 shows that immovables-backed loans are more common in practically all countries, but the higher is the MC Law Index score the less of the difference one observes in the relative frequency of loans made against immovable and movable assets. Table 3 reports the relative frequency of both types of collateralized loans, and shows that in weak-law countries loans collateralized by immovables tend to be relatively more common (76.6% versus 69.6%).

[Insert Figure 2, Table 3 here]

[9] In the regression results reported below, we made use of an internal GlobalBank firm rating to try to control for firm heterogeneity. Surprisingly, however, excluding this variable had little effect on our results, which either indicates that unobserved cross-sectional heterogeneity is not very important, or that the GlobalBank firm rating does a poor job of capturing it.

To explore the potential consequences for the real economy, we examine how the frequency of immovable collateral varies across sectors with different natural usage of immovable assets. As a way to identify the exogenous (technologically given) composition of assets across sectors, we employ data on sectoral asset composition for the U.S. Presumably, in the U.S., which enjoys an unusually good legal framework for the collateralization of movable assets, differences in the asset composition of sectors is essentially unaffected by legal shortcomings in the ability to pledge movables as collateral.[10] This approach is akin to the Rajan and Zingales (1998) approach for measuring sectoral external financial dependence.[11] We will make the operating assumption that the sectoral *ranking* of immovable intensity is common across the U.S. and our sample of countries.

Figure 3 reports the average proportion of immovable assets (land and buildings divided by total assets) for each of 36 two-digit sectors in the U.S. over the period 1984 to 1996.[12] Clearly, there are large cross-sectoral differences in the proportion of immovable assets (roughly 3.5% in air transport, 10% in paper and paper products, 16% in tobacco products, 22% in non-metallic mining, and 24% in real estate).

[Insert Figure 3 here]

Table 4 examines the sectoral frequency with which the GlobalBank loans in our sample are collateralized by immovable assets, which we measure across sector types (immovable-intensive sectors versus movable-intensive sectors) and across collateral law strength. We identify sectors either as immovable-intensive or movable-intensive on the basis of whether those sectors are above or below the median for the sectoral real estate index shown in Figure 3. We find that 82.6% of GlobalBank loans made to immovable-intensive sectors in weak-law countries are collateralized by immovables. In strong-

[10] Secured transactions over movable assets in the U.S. are governed by Article 9 of the Uniform Comercial Code (U.C.C.).

[11] The Rajan and Zingales (1998) approach has been criticized by Fisman and Love (2004). The Fisman and Love critique of Rajan and Zingales' method for measuring external financial dependence, however, does not apply to our asset composition measure, since our measure focuses on asset composition, not internally generated funding, which Fisman and Love argue is likely to capture demand shocks.

[12] As explained in Campello and Giambona (2013), this is the only time frame for which Compustat data separates movable assets (machinery and equipment) from immovable assets (land and buildings).

law countries, only 71% of the loans to immovable-intensive sectors are collateralized by immovables. The proportion of immovable-collateralized loans made to non-intensive sectors are roughly the same for weak-law and strong-law countries (71.9% versus 71.7%). The average difference in loans collateralized by immovables across immovable-intensive sectors and non-intensive sectors is 10.6% in weak-law countries and -1.2% in strong-law countries, and significant at the 1%-level across legal frameworks. The results imply that the relative use of immovables-based lending in weak-law countries primarily reflects the greater use of immovables as collateral in the immovable-intensive sectors.

[Insert Table 4 here]

To formally test the effect of collateral laws on the frequency of immovable-backed loans, we run the following difference-in-differences estimation:

$$ImmovableFrequency_{sc} = \alpha_s + \alpha_c + \beta Law_c + \gamma REI_s + \delta Law_c * REI_s + \theta X_{sc} + \varepsilon_{sc},$$

where $ImmovableFrequency_{sc}$ is the fraction of loans collateralized by immovable assets in sector *s* in country *c* and REI_s is a sectoral indicator variable that takes the value 1 if the sector is above the median value of the sectoral index of immovable intensity and 0 otherwise. The specification includes a full set of sector fixed effects (α_s) and country fixed effects (α_c). We are interested in coefficient δ, which identified from the within-country variation across sectors. The coefficient estimates the difference between the frequency of immovable-backed loans in real estate-intensive and non-intensive sectors in strong-law countries, relative to the difference in the frequency of immovable-backed loans in weak-law countries. Finally, we include the sectoral average of the same borrower-level characteristics used in the LTV regression to control for differences in the supply of collateral at the sectoral level (X_{sc}).

Table 5 reports the results. Columns (1)-(3) include a progressively broader set of fixed effects. The coefficient on the interaction term *Law*REI* is negative, significant, and stable across all specifications. We will focus on column (3), which is our preferred specification. According to the results, the difference between the frequency of immovable-backed loans in sectors with high and low

real-estate intensity is 8.4 percentage points lower in strong-law countries than in weak-law countries. On average, weak-law borrowers in real estate-intensive sectors pledge immovable collateral in 82.6% of GlobalBank loans, while borrowers in non-intensive sectors pledge immovable collateral in 71.9% o loans (Table 4). Thus, the regression results imply that a better collateral legal framework almost entirely mitigates the bias in lending towards immovables found in weak-law countries.

[Insert Table 5 here]

IV.Collateral Laws and GlobalBank's Lending: Additional Results

A.Supra-Collateral Analysis

Table 6 describes the relationship between Supra collateral lending by GlobalBank and the MC Law Index scores of countries. Recall that Supra collateral insulates loan contracts from local legal imperfections, either through a foreign enforcement of a foreign payment, a foreign-enforced guarantee, or a domestic right of setoff that does not depend on movables collateral laws. Column (1) reports the proportion of Supra collateral lending and column (2) the LTVs for Supra collateral loans by country group (strong-law and weak-law). The proportion of Supra collateral loans relative to the sum of Supra collateral lending and movables-backed lending for strong-law and weak-law countries are quite similar, although there is a bit more Supra collateral lending relative to movables-backed lending in weak-law countries (38.3% versus 37.1%). The LTVs for Supra lending are also similar across the two groups, although they are slightly higher on average in weak-law countries (89.7% versus 85%, the difference is statistically insignificant). These data suggest that, compared to the effect of the legal environment on movables lending, there is less of an effect of the legal environment on the use or terms for Supra collateral lending. One interpretation of this is that there are some firms (call them globally active firms) that are able to borrow via Supra collateral lending, and there is an exogenously given, comparable proportion of these firms in both strong-law and weak-law countries.

[Insert Table 6 here]

In order to formally compare the LTVs for Supra collateral loans to those of loans collateralized immovables, we estimate:

$$LT\text{\textdiamond}_i = \alpha_c + \beta Law_c + \gamma_1 Movable_i + \gamma_2 Supra_i + \delta_1 Law_c * Movable_i + \delta_2 Law_c * Supra_i + \theta X_i + \varepsilon_i,$$

where $Movable_i$ is an indicator variable that takes the value 1 if the loan is collateralized by a movable asset and zero otherwise and $Supra_i$ is an indicator variable equal to 1 if the loan is collateralized by Supra collateral and zero otherwise. The coefficient δ_1 estimates the difference between LTVs of loans collateralized by movable and immovable assets in strong-law countries, relative to the difference in LTVs in weak-law countries. Similarly, the coefficient δ_2 measures the difference between LTVs of loans collateralized by Supra and immovable assets in strong-law countries, relative to the same difference in weak-law countries.

The results reported in Table 7 for the difference between movables-collateralized and immovables-collateralized loans are consistent with earlier findings. As before, loans backed by movables in strong-law countries have LTVs that are 21 percentage points higher than loans backed by immovables, relative to weak-law countries (given by the coefficient on the *Law*Movable* interaction term in column (3)). When we compare loans backed by Supra and immovable assets, we find that the difference between the LTVs of supra and immovable-backed loans is 9 percentage points lower in strong-law countries than in weak-law countries (given by the coefficient on the *Law*Supra* interaction term). This result, combined with the descriptive statistics in Tables and 1 and 6, implies that while Supra-collateral captures a higher LTV than immovable assets in weak-law countries, this effect is overturned in strong-law countries.

[Insert Table 7 here]

B.Slovakia Reform Analysis

As we discuss in Section II, a dramatic shift in the ability to collateralize movables occurred in Slovakia in 2003, and this enables us to perform a within-country cross-time analysis of the effect of this reform on movables lending in that country. To do so, we run the following difference-in-differences estimation:

$$LT\hat{V}_{it} = \alpha_i + \alpha_t + \beta Movable_i + \gamma Post_t * Movable_i + \theta X_{it} + \varepsilon_{it},$$

where LTV_{it} is the loan-to-value for a loan made to firm i in year t and $Post_t$ is a reform indicator variable that takes the value 1 after January 1st 2003 and 0 otherwise. Each firm included in the sample appears once in both the pre-reform and post-reform period (where, as before, we use only the first loan observed in each period). The specification includes a full set of firm fixed effects (α_i) and year fixed effects (α_t).

We are interested in coefficient γ, which is identified from the within-firm variation across time. The coefficient provides an estimate of the difference between LTVs of loans collateralized by movable and immovable assets after the reform, relative to the difference in LTVs before the reform. We include time-varying borrower-level characteristics, X_{it}, to control for differences in the supply of collateral.

Table 8 reports the estimation results for Slovakia. According to column (3), which includes borrower and quarterly time fixed effects, the difference between the LTVs of movable and immovable-backed loans increases by 18.2 percentage points after the passage of the law. The unconditional mean LTV for movables (immovables) in Slovakia was 0.66 (0.87) prior to the reform. Hence the results suggest that the pre-form wedge in LTV across immovable and movables almost entirely disappeared post reform. The fourth column of Table 8 reports a placebo regression for the remaining countries in the GlobalBank sample, which did not implement collateral reforms during the sample period. The idea is to verify that there was no general worldwide improvement in LTVs for loans collateralized by movables after January 1, 2003. The coefficient on the interaction term *Post*Movable* is statistically insignificant, which confirms that our results are not driven by a global shock increasing the difference between LTVs backed by movable and immovable assets.

[Insert Table 8 here]

We also investigated changes in movables lending frequency in Slovakia after the reform.[13] We find a small increase in the frequency of movables loans – an increase from 20.2% prior to the beginning of 2003 to 22.8% afterward. However, given the small sample size, this average change is not statistically significant. This could be the result of the fact that adjustments at the extensive margin take more time to materialize than adjustments at the intensive margin.

C.Robustness Checks

Tables 9 and 10 report various robustness tests of our results on LTVs and loan frequency in Tables 2 and 5, respectively. In the column (1) of Table 9, we employ a continuous measure of the MC Law Index as our measure of *Law*, rather than an indicator variable. Although the coefficient's size is different (consistent with the change in the mean of the regressor), results remain highly significant. Column (2) shows that Table 2's results are invariant to omitting accounts receivable from the definition of movable assets. Column (3) interacts the movable-loans indicator with country-level macroeconomic characteristics that might affect the loan-contracting environment. We include GDP per capita to ensure that our estimates are not reflecting differences in a country's level of economic development. Similarly, we include data from the World Bank on adherence to the rule of law in the country. We also control for differences in tariffs that are applied to manufacturing goods relative to all goods. Finally, we include population density, which could affect sectoral allocation by affecting comparative advantage in production. Our results are unaffected by controlling for these country-level characteristics.

Column (4) confines the loan sample to manufacturing firms (the subject of Section V below) and finds no significant difference in coefficients. Table 10 explores the robustness of the loan frequency results, using the same robustness checks in Table 9, and finds that Table 5's estimates are robust to these variations.

[13] These results are available upon request.

[Insert Tables 9, 10 here]

Table 11 explores whether dividing countries into finer categories (rather than above- and below-median levels of the MC Law Index) affects our results. Specifically, we divide countries into three groups, those with a low-MC Law Index (the omitted category), a *Middle-Law* group, and a *High-Law* group. Columns (1)-(2) report the results for the LTVs and columns (3)-(4) for the immovable-loan frequency. We find that coefficients tend to be higher for the *High-Law* group than for the *Middle-Law* group. Similarly, for the other variable analyzed in the next section (manufacturing production share), we also find that much of the effects of *Law* is attributable to the differences between high MC Law Index values and all others. To conserve space and in recognition of that fact, our subsequent tables divide countries according to *Law* by comparing the *High-Law* group to the rest of the sample.

[Insert Table 11 here]

V. Movable Collateral Laws and the Sectoral Allocation of Resources

A. GlobalBank-sample of countries

In order to analyze the real consequences of collateral laws, we use data from the UNIDO dataset, which provides information on output and employment for 22 manufacturing sectors.[14] For each sector, we calculate its share in total output by dividing sectoral output by aggregate manufacturing output. We do the same for employment. In order to match the time period used in the loan-level analysis, we average the sectoral shares between 2002 and 2004. In Figure 4, we plot the MC Law Index against the output share (Panel A) and employment share (Panel B) of immovable-intensive sectors. The figure depicts a strong negative relationship between the MC Law Index and the output share and employment share in sectors that are intensive users of real estate. In other words, countries with weak collateral laws tend to allocate a great fraction of their resources towards immovable-intensive sectors.

[14] As mentioned above, UNIDO does not provide information for Pakistan and Sri Lanka. As a result, when analyzing our GlobalBank sample of twelve countries, we are left with a sample of ten countries.

[Insert Figure 4 here]

In Table 12, we report the sectoral share of output (column 1) and employment (column 2) used in immovable-intensive sectors for countries with weak and strong collateral laws. As can be seen from Panel C, countries with weak collateral laws allocate on average 70.2% of their production to sectors intensive in real estate, while countries with strong collateral laws allocate only 52.1%. The difference, which is equal to 18.1%, is statistically significant at the 5%-level. Similar results hold for employment. In weak-law countries, the share of employment used in immovable-intensive sectors is 17.1% higher than in strong-law countries (=65.1%-48%, the difference is statistically significant at the 1%-level).

[Insert Table 12 here]

To formally test the effect of collateral laws on the sectoral allocation of resources, we run the following regression:

$$Share_{sc} = \alpha_s + \beta Law_c * R\text{\textdiamond}I_s + \gamma X_c * R\text{\textdiamond}I_s + \varepsilon_{sc},$$

where $Share_{sc}$ is the ratio of sectoral output (or employment) to total output (or employment) of sector *s* in country *c*. The specification includes a full set of sectoral fixed effects (α_s). We do not include country fixed effects in the regression because the outcome variables are shares (country fixed effects would affect all sectors within a country equally, which is not possible since by definition the shares sum up to one.) The coefficient of interest is β, which measures the difference between the sectoral share of output (or employment) allocated to immovable-intensive sectors in countries with strong and weak collateral laws. Note that the variable *Share* already represents a within-country difference between resources allocated to immovable-intensive and non-intensive sectors. Therefore, the regression is akin to a difference-in-differences estimation, in which we calculate the difference between resources allocated to sectors with different immovable intensities, between countries with different strengths of collateral laws. To account for the fact that other country characteristics might affect the allocation of resources between immovable-intensive and non-intensive sectors, we add to the specification the same set of country-level

control variables used in the previous section; each interacted with the real estate intensity indicator ($X_c * R\hat{e}al_s$).[15]

Table 13 reports the regression results. Columns (1)-(2) show the results for output and columns (3)-(4) for employment. The interaction term is negative and statistically significant for both the output and employment regressions. According to the results, the output share of the representative immovable-intensive sector in weak-law countries is 1.4 percentage points higher than in strong-law countries (column (1)). This is a large effect. Recall that there are 11 immovable-intensive manufacturing sectors in each of the 10 countries. The results imply that in the aggregate, weak-law countries allocate 15.4% more of their production to immovable-intensive sectors than strong-law countries (=1.4%*11). The effect is robust to controlling for other country-level characteristics, interacted with the real-estate sectoral indicator. The magnitude of the effect is consistent with the differences reported in Table 12. We obtain similar results for employment (column (3)). In the aggregate, the fraction of workers employed in real estate-intensive sectors in weak-law countries is 14.3 percentage points higher than in strong-law countries (=1.3%*11).

[Insert Table 13 here]

B. Extended-sample of countries

Next, we extend our analysis beyond the sample of the GlobalBank countries. There are 90 countries for which data are available from the UNIDO and *Doing Business* datasets. We drop three countries for which some sectoral output observations are missing and we also drop the U.S. given that our immovable-intensity indicator is calculated using U.S. data. This leaves us with a sample of 86 countries with output data. Of these countries, only 80 also report employment data. UNIDO also provides

[15] We include GDP per capita to control for a country's level of economic development. Similarly, we control for adherence to the rule of law in the country, which has been shown to affect sectoral allocation. We control for differences in tariffs that are applied to manufacturing goods relative to all goods, as these too could result in differences in sectoral allocations (indeed, this is a key goal of tariff policy). We also include population density, which could affect sectoral allocation by affecting comparative advantage in production.

information about the number of establishments operating in a sector. For the extended sample, 41 countries have data on the number of establishments.[16]

We report the results in Table 14. Columns (1)-(2) report the results for output, columns (3)-(4) for employment, and columns (5)-(6) for the number of establishments. We find that the results for output are qualitatively similar to our results in Table 13, although the magnitude of the estimate for the interaction term is smaller – roughly half the size of the estimate in Table 13 (=0.007/0.014). The estimates in column (1) imply that the output share of the representative immovable-intensive sector is 0.7 percentage points higher in weak-law countries than in strong-law countries. Given that there are 11 immovable-intensive sectors, these estimates imply that in the aggregate, weak-law countries allocate 7.7% more of their output to real estate-intensive sectors than strong-law countries (=0.7%*11). The result is robust to including country control variables' interactions with sectoral immovable intensity. According to the results of column (3), the fraction of employees in the aggregate working in immovable-intensive sectors in weak-law countries is also 7.7 percentage points higher than in strong-law countries (=0.7%*11). Finally, column (5) shows that weak-collateral laws also distort the allocation of resources at the extensive margin. In the aggregate, the share of the number of establishments in immovable-intensive sectors in weak-law countries is 18.7 percentage points higher than in strong-law countries, which is a sizable difference (=1.7%*11).

[Insert Table 14 here]

We experimented with various alternative specifications (varying the cutoffs and components of the MC Law Index included in the measures of the law indicator) but those variations did not affect the sizes of the coefficients very much; the effect is consistently larger for the sample of 10 countries than for the sample of 86 countries. One possibility is that this size difference reflects the non-random aspect of our GlobalBank sample. After all, GlobalBank entered these countries precisely because it viewed them

[16] For the GlobalBank sample, only 4 of the 10 countries had data on the number of establishments, which prevented us from doing any meaningful analysis with this variable.

as desirable locations for expanding its business. Perhaps the attributes of these countries that made them desirable locations for GlobalBank also are related to greater responsiveness of producers to economic costs or opportunities, which might explain the greater responsiveness of sectoral output shares to collateral law strength.

VI. Conclusions

Our paper is the first to connect differences in the legal environments across countries with respect to movables collateral to the lending behavior of a global bank. We use a novel cross-country dataset that has the unique feature of providing information regarding asset liquidation values, which allows us to construct meaningful LTVs for loans collateralized by different types of assets. Our paper is also the first to show that collateralization laws in emerging market countries that discourage the use of movables assets as collateral create distortions in the allocation of resources that favor immovable-based production.

We find that differences across countries in their legal systems' ability to support the use of movable assets as collateral for bank loans substantially affect the ability of borrowers to gain access to credit. The consequences for reduced lending and constrained LTV ratios also are reflected in important differences in production, employment, and entry. In countries with poorly developed movables collateralization law, firms in sectors that exogenously rely more on movable factors in the production process tend to see a shrinkage in their number and in their shares of production and employment, compared to other firms. These effects are all economically large as well as statistically significant. Our study has important implications for understanding how legal system deficiencies – specifically, the absence of effective means of collateralizing movable assets – can shape bank loan supply, as well as firms' choices of asset composition, and the sectoral distribution of production and employment.

References

Alvarez de la Campa, A., 2011, "Increasing Access to Credit through Reforming Secured Transactions in the MENA Region," World Bank Policy Research Working Paper No. 5613.

Argentiero, A., 2009, "Some New Evidence on the Role of Collateral: Lazy Banks or Diligent Banks?," Institute for Studies and Economic Analyses Working Paper No. 113.

Bae, K., and V. Goyal, 2009, "Creditor Rights, Enforcement, and Bank Loans," *Journal of Finance* 64, 823-860.

Beck, T., R. Levine, and N. Loayza, 2000, "Financial Intermediation and Growth: Causality and Causes," *Journal of Monetary Economics* 46, 31-77.

Beck, T., A. Demirgüç-Kunt, and V. Maksimovic, 2008, "Financing Patterns Around the World: Are Small Firms Different?," *Journal of Financial Economics* 89, 467-487.

Benmelech, E., 2009, "Asset Salability and Debt Maturity: Evidence from 19th Century American Railroads," *Review of Financial Studies* 22, 1545-1583.

Benmelech, E., M. Garmaise, and T. Moskowitz, 2005, "Do Liquidation Values Affect Financial Contracts? Evidence From Commercial Loan Contracts and Zoning Regulation," *Quarterly Journal of Economics* 120, 1121-1154.

Benmelech, E., and N. Bergman, 2009, "Collateral Pricing," *Journal of Financial Economics* 91, 339-360.

Benmelech, E., and N. Bergman, 2011, "Bankruptcy and the Collateral Channel," *Journal of Finance* 66, 337-378.

Berger, A., and G. Udell, 1990, "Collateral, Loan Quality and Bank Risk," *Journal of Monetary Economics* 25, 21-42.

Berger, A., M. Espinosa-Vega, W. Frame, and N. Miller, 2011, "Why Do Borrowers Pledge Collateral? New Empirical Evidence on the Role of Asymmetric Information," *Journal of Financial Intermediation* 20, 55-70.

Berger, Allen N., Marco A. Espinosa-Vega, W. Scott Frame, and Nathan H. Miller, 2011, "Why Do Borrowers Pledge Collateral? New Empirical Evidence on the Role of Asymmetric Information," *Journal of Financial Intermediation* 20, 55-70.

Berger, A., W. Frame, and V. Ioannidou, 2011, "Tests of Ex Ante Versus Ex Post Theories of Collateral Using Private and Public Information," *Journal of Financial Economics* 100, 85-97.

Berger, A., T. Kick, M. Koetter, and K. Schaeck, 2013, "Does It Pay to Have Friends? Social Ties and Executive Appointments in Banking," *Journal of Banking and Finance* 37, 2087-2105.

Bester, H., 1985, "Screening vs. Rationing in Credit Markets with Imperfect Information," *American Economic Review* 75, 850-855.

Black, S., and P. Strahan, 2002, "Entrepreneurship and Bank Credit Availability," *Journal of Finance* 57, 2807-2833.

Boot, A., and A. Thakor, 1994, "Moral Hazard and Secured Lending in an Infinitely Repeated Credit Market Game," *International Economic Review* 35, 899-920.

Campello, M. and E. Giambona, 2013, "Real Assets and Capital Structure," *Journal of Financial and Quantitative Analysis* 48, 1333-1370.

Campello, M., and M. Larrain, 2014, "Enlarging the Contracting Space: Collateral Menus, Access to Credit, and Economic Activity," Mimeo, Columbia Business School.

Cerqueiro, G., S. Ongena, and K. Roszbach, 2014, "Collateralization, Bank Loan Rates and Monitoring," *Journal of Finance*, forthcoming.

Cetorelli, N., and M. Gambera, 2001, "Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data," *Journal of Finance* 56, 617-648.

Ceterolli, N., and P. Strahan, 2006, "Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets," *Journal of Finance* 61, 437-461.

Chan, Y., and A. Thakor, 1987, "Collateral and Competitive Equilibria with Moral Hazard and Private Information," *Journal of Finance* 42, 345-363.

Chaney, T., D. Sraer, and D. Thesmar, 2012, "The Collateral Channel: How Real Estate Shocks Affect Corporate Investment," *American Economic Review* 102, 2381-2409.

Chemin, M., 2010, "Does Court Speed Shape Economic Activity? Evidence from a Court Reform in India," *Journal of Law, Economics, and Organization* 11, 1-26.

Correa, R., 2008,. "Bank Integration and Financial Constraints: Evidence from U.S. Firms," International Finance Discussion Papers 925. Board of Governors of the Federal Reserve System.

Degryse, H., V. Ioannidou, J. Liberti, and J. Sturgess, 2014, "When do Laws and Institutions Affect Recovery Rates on Collateral?," Working Paper.

Dehejia, R., and A. Lleras-Muney, 2007, "Financial Development and Pathways of Growth: State Branching and Deposit Insurance Laws in the United States from 1900 to 1940," *Journal of Law and Economics* 50, 239-272.

Demirgüç-Kunt, A., and V. Maksimovic, 1998, "Law, Finance, and Firm Growth," *Journal of Finance* 53, 2107-2137.

Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer, 2003, "Courts," *Quarterly Journal of Economics* 118, 453-518.

Djankov, S., O. Hart, C. McLiesh, and A. Shleifer, 2008, "Debt Enforcement around the World," *Journal of Political Economy* 116, 1105-1149.

Fisman, R., and I. Love, 2004, "Financial Development and Intersectoral Allocation: A New Approach," *Journal of Finance* 59, 2785-2807.

Fleisig, H., M. Safavian, and N. De La Peña, 2006, *Reforming Collateral Laws to Expand Access to Finance,* (Washington: World Bank).

Fry, M., 1988, *Money, Interest and Banking in Economic Development*, (Baltimore: Johns Hopkins University Press).

Gan, J., 2007, "Collateral, Debt Capacity, and Corporate Investment: Evidence from a Natural Experiment," *Journal of Financial Economics* 85, 709-734.

Godlewski, C., and L. Weill, 2011, "Does Collateral Help Mitigate Adverse Selection? A Cross-Country Analysis" *Journal of Financial Services Research* 40, 49-78.

Goldschmidt, R., 1933, *The Changing Structure of American Banking*, (London: George Routledge).

Goldsmith, R., 1969, *Financial Structure and Development*, (New Haven and London: Yale University Press).

Gorton, G., and J. Khan, 2000, "The Design of Bank Loan Contracts," *Review of Financial Studies* 13, 331-364.

Guiso, L., P. Sapienza, and L. Zingales, 2004, "The Role of Social Capital in Financial Development," *The American Economic Review* 94, 526-556.

Gurley, J., and E. Shaw, 1960, *Money in a Theory of Finance*, (Washington: Brookings Institution).

Gurley, J., H. Patrick, and E. Shaw, 1965, *Financial Structure of Korea*, (Seoul, Korea: Bank of Korea).

Haselmann, R., K. Pistor, and V. Vig, 2010, "How Law Affects Lending," *Review of Financial Studies* 23, 549-580.

Jayartne, J., and P. Strahan, 1996, "The Finance-Growth Nexus: Evidence from Bank Branch Deregulation," *Quarterly Journal of Economics* 111, 639-670.

Jiménez, G., V. Salas, and J. Saurina, 2006, "Determinants of Collateral," *Journal of Financial Economics* 81, 255-281.

John, K., A. Lynch, and M. Puri, 2003, "Credit Ratings, Collateral, and Loan Characteristics: Implications for Yield," *Journal of Business* 76, 371-409.

King, R., and R. Levine, 1993, "Finance and Growth: Schumpeter Might Be Right," *Quarterly Journal of Economics* 108, 717-737.

Lacker, J., 2001, "Collateralized Debt as the Optimal Contract," *Review of Economic Dynamics* 4, 842-859.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1997, "Legal Determinants of External Finance," *Journal of Finance* 52, 1130-1150.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1998, "Law and Finance," *Journal of Political Economy* 106, 1113-1155.

Levine, R., and S. Zervos, 1998, "Stock Markets, Banks, and Economic Growth," *The American Economic Review* 88, 537-558.

Liberti, J., and A. Mian, 2010, "Collateral Spread and Financial Development," *Journal of Finance* 65, 147-177.

Lilienfeld-Toal, U., D. Mookherjee, and S. Visaria, 2012, "The Distributive Impact of Reforms in Credit Enforcement: Evidence from Indian Debt Recovery Tribunals," *Econometrica* 80, 497-558.

Longhofer, S., and J. Santos, 2000, "The Importance of Bank Seniority for Relationship Lending," *Journal of Financial Intermediation* 9, 57-89

Love, I., M. Peria, and S. Singh, 2013, "Collateral Registries for Movable Assets: Does their Introduction Spur Firms' Access to Bank Finance?" World Bank Working Paper 6477.

McKinnon, R., 1973, *Money and Capital in Economic Development*, (Washington: Brookings Institution).

Ono, A., and I. Uesugi, 2009, "Role of Collateral and Personal Guarantees in Relationship Lending: Evidence from Japan's SME Loan Market," *Journal of Money, Credit and Banking* 41, 935-960.

Qian, J., and P. Strahan 2007, "How Laws and Institutions Shape Financial Contracts: The Case of Bank Loans," *Journal of Finance* 62, 2803-2834.

Rampini, A., and S. Viswanathan, 2013, "Collateral and Capital Structure," *Journal of Financial Economics* 109, 466-492.

Rajan, R., and A. Winton, 1995, "Covenants and Collateral as Incentives to Monitor," *Journal of Finance* 50, 1113-1146.

Rajan, R., and L. Zingales, 1998, "Financial Dependence and Growth," *American Economic Review* 88, 559-586.

Shaw, E., 1973, *Financial Deepening in Economic Development*, (London and Toronto: Oxford University Press).

Shleifer, A., and R. Vishny, 1992, Liquidation Values and Ddebt Capacity: A Market Equilibrium Approach. *Journal of Finance* 47, 1343-1366.

Taylor, A. M., 1998, "On the Costs of Inward-Looking Development: Price Distortions, Growth, and Divergence in Latin America." *Journal of Economic History* 58, 1–28.

Vig, V., 2013, "Access to Collateral and Corporate Debt Structure: Evidence from a Natural Experiment," *Journal of Finance* 68, 881-928.

Wurgler, J., 2000, "Financial Markets and The Allocation of Capital," *Journal of Financial Economics* 58, 187-214.

Figure 1: Collateral Law Strength and the Di↵erence Between the Loan-to-Value of Immovable and Movable-backed Loans

The figure plots the relationship between a country's index of collateral law strength and the di↵erence between the loan-to-value (LTV) of loans backed by immovable assets and movable assets.

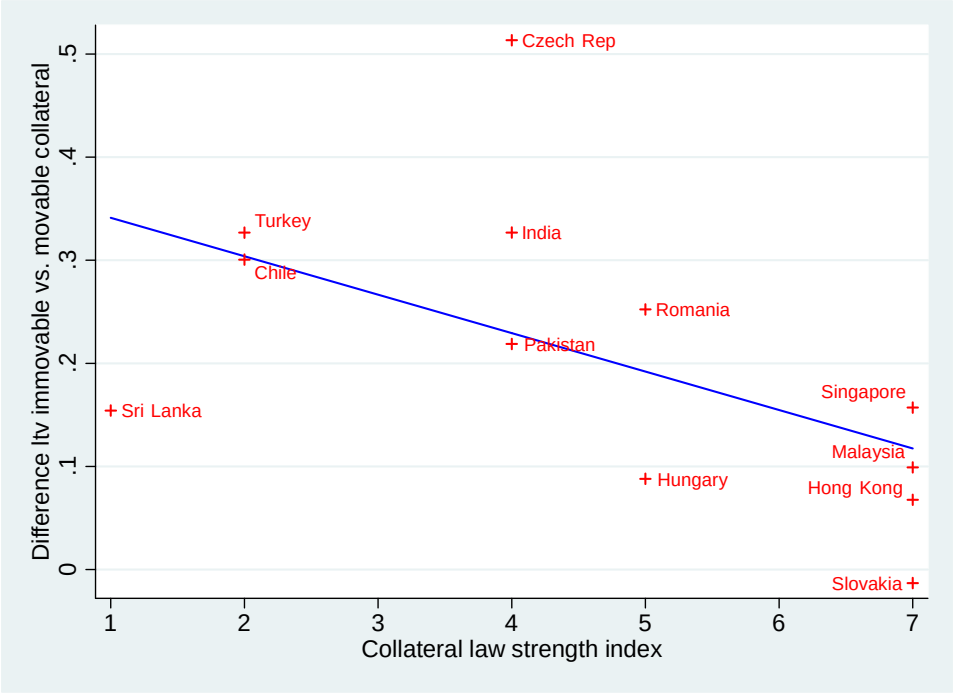


Figure 2: Collateral Law Strength and the Di↵erence Between the Frequency of Immovable and Movable-backed Loans

The figure plots the relationship between a country's index of collateral law strength and the di↵erence between the frequency of loans collateralized by immovable assets and movable assets.

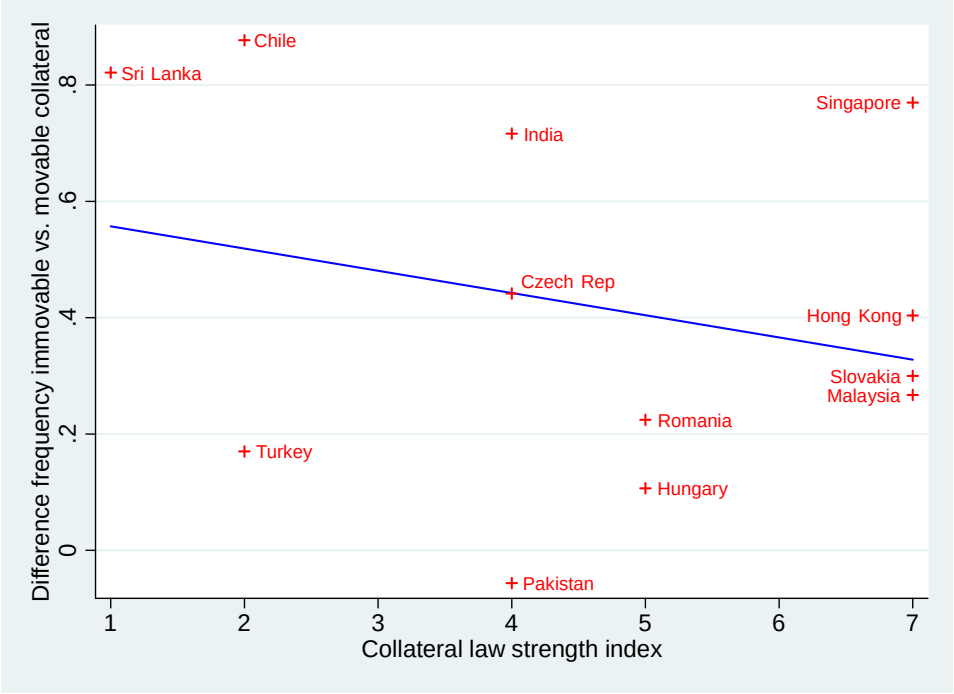


Figure 3: Sectoral Index of Real Estate Intensity

The figure plots the sectoral index of real estate intensity for the 36 two-digit sectors in the sample (International Standard Industrial Classification, Revision 3). The index is calculated as the median of the average ratio of land and buildings to total assets across publicly traded firms in the U.S. in each sector during the period 1984-1996.

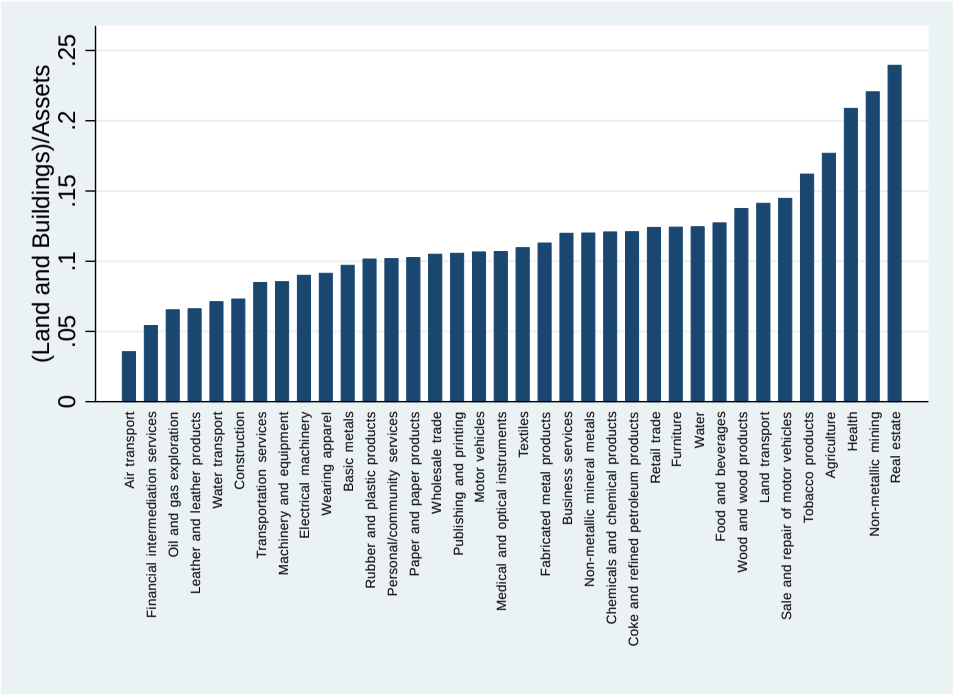
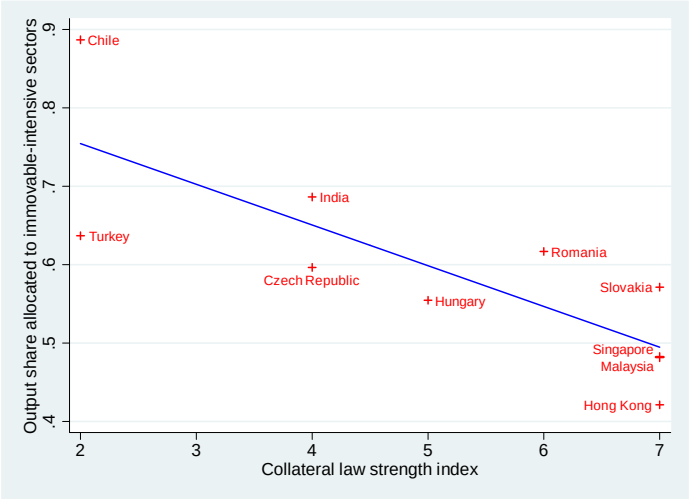
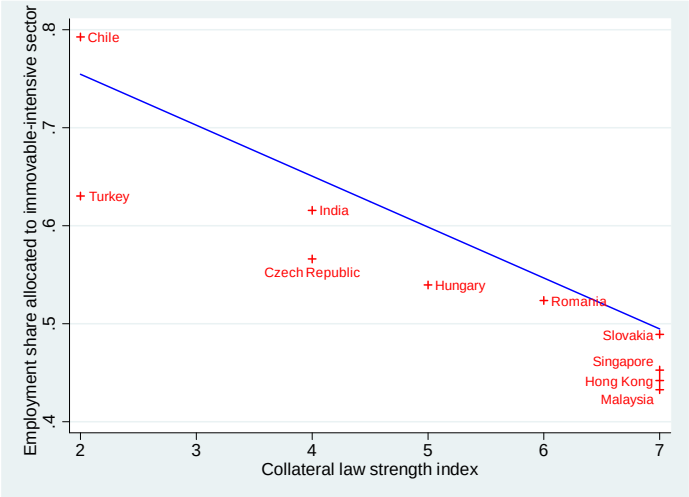


Figure 4: Collateral Law Strength and the Sectoral Allocation of Output and Employment

The figure plots the relationship between a country's index of collateral law strength and the average ratio of output in immovable-intensive sectors to total output (panel A), and the average ratio of employment in immovable-intensive sectors to total employment (panel B). The average is taken during the period 2002-2004. Sectors intensive in real estate consist of sectors above the median of the sectoral index of real estate intensity.



A. Sectoral Share of Output



B. Sectoral Share of Employment

Table 1: Loan-to-Value by Collateral Law Strength and Collateral Type

The table reports the average loan-to-value for 3,479 borrowers in 12 countries with weak and strong collateral laws, by collateral type. Strong-law countries consist of countries above the median of the collateral law strength index; weak-law countries consist of countries below the median. Collateral type is either *Immovable* or *Movable*. *Immovable* includes real estate, *Movable* includes other firm assets such as equipment, machinery, and inventory.

	(1)	(2)	(3)
Collateral =	Immovable Assets	Movable Assets	Difference Immovable - Movable Assets
A. Weak-law countries			
Chile	0.783	0.482	0.301
Czech Republic	0.784	0.271	0.513
India	0.833	0.506	0.327
Pakistan	0.838	0.619	0.219
Sri Lanka	0.989	0.835	0.154
Turkey	0.804	0.477	0.327
B. Strong-law countries			
Hong Kong	0.928	0.861	0.068
Hungary	0.902	0.814	0.088
Malaysia	0.840	0.741	0.099
Romania	0.877	0.625	0.252
Singapore	0.894	0.737	0.157
Slovakia	0.844	0.857	-0.013
C. Average weak- and strong-law countries			
Weak-law countries	0.815	0.443	0.372
Strong-law countries	0.910	0.828	0.082

Table 2: E↵ect of Collateral Laws on Loan-to-Value

This table presents the results from the following regression:

$$LTV_i = \downarrow_c + j3Law_c + [Movable_i + JLaw_c \leftarrow Movable_i + \checkmark X_i + ''_i,$$

where LTV_i is the loan-to-value for a loan made to firm i collateralized by assets that are either immovable or movable. Law_c is a dummy equal to one for countries above the median of the collateral law strength index and zero otherwise. *Movable* is a dummy variable equal to one if collateral is movable (firm assets such as equipment, machinery, and inventory) and zero otherwise. X_i denotes a vector of firm-level controls. The sample includes 3,479 borrowers in 12 countries. The specification includes a full set of country fixed e↵ects ($\downarrow_c$) in columns (2) and (3). Additional tests include sector fixed e↵ects ($\downarrow_s$) in column (3). The standard errors are clustered at the country level.

Dep. Variable: LTV	(1)	(2)	(3)
Law	0.106***		
	(0.019)		
Movable	-0.292***	-0.289***	-0.288***
	(0.031)	(0.029)	(0.027)
Law x Movable	0.207***	0.210***	0.211***
	(0.033)	(0.032)	(0.030)
Firm Controls			
Firm Ratings	Yes	Yes	Yes
Firm Size	Yes	Yes	Yes
Balance Sheet Data (4 Ratios)	Yes	Yes	Yes
Fixed E↵ects			
Country	No	Yes	Yes
Sector	No	No	Yes
Observations	3,479	3,479	3,479
R-squared	0.25	0.27	0.29

Table 3: Frequency of Loans by Collateral Law Strength and Collateral Type

The table reports the frequency of loans for 3,479 borrowers in 12 countries with weak and strong collateral laws, by collateral type. Strong-law countries consist of countries above the median of the collateral law strength index; weak-law countries consist of countries below the median. Collateral type is either *Immovable* or *Movable*. *Immovable* includes real estate, *Movable* includes other firm assets such as equipment, machinery, and inventory.

	(1)	(2)	(3)
Collateral =	Immovable Assets	Movable Assets	Difference Immovable - Movable Assets
A. Weak-law countries			
Chile	0.938	0.062	0.877
Czech Republic	0.721	0.279	0.442
India	0.858	0.142	0.716
Pakistan	0.472	0.528	-0.056
Sri Lanka	0.911	0.089	0.821
Turkey	0.585	0.415	0.170
B. Strong-law countries			
Hong Kong	0.702	0.298	0.404
Hungary	0.553	0.447	0.107
Malaysia	0.634	0.366	0.267
Romania	0.612	0.388	0.224
Singapore	0.885	0.115	0.770
Slovakia	0.650	0.350	0.300
C. Average weak- and strong-law countries			
Weak-law countries	0.766	0.233	0.534
Strong-law countries	0.696	0.304	0.392

Table 4: Frequency of Immovable-backed Loans by Collateral Law Strength and Sectoral Immovable Intensity

The table reports the frequency of loans backed by immovable collateral for 222 sectors in 12 countries with weak and strong collateral laws, by real-estate sectoral intensity. *Immovable* collateral includes real estate. Strong-law countries consist of countries above the median of the collateral law strength index; weak-law countries consist of countries below the median. Immovable-intensive consist of sectors above the median of the sectoral real estate intensity index.

	(1)	(2)	(3)
Collateral =	Frequency Immovable Assets Intensive Sectors	Frequency Immovable Assets Non-Intensive Sectors	Di↵erence Intensive - Non-Intensive Sectors
A. Weak-law countries			
Chile	0.960	0.924	0.035
Czech Republic	0.875	0.793	0.082
India	0.866	0.815	0.051
Pakistan	0.634	0.432	0.202
Sri Lanka	1.000	0.771	0.229
Turkey	0.663	0.518	0.145
B. Strong-law countries			
Hong Kong	0.661	0.661	0.000
Hungary	0.700	0.597	0.103
Malaysia	0.672	0.675	-0.003
Romania	0.500	0.607	-0.107
Singapore	0.917	0.957	-0.040
Slovakia	0.692	0.735	-0.043
C. Average weak- and strong-law countries			
Weak-law countries	0.826	0.719	0.106
Strong-law countries	0.708	0.717	-0.012

Table 5: E↵ect of Collateral Laws on Frequency of Immovable-backed Loans

This table presents the results from the following regression:

$$ImmovableFrequency_{sc} = \leftarrow_s + \leftarrow_c + f3Law_c + rREI_s + r5Law_c \Leftarrow REI_s + \checkmark X_s + "_{sc},$$

where $ImmovableFrequency_{sc}$ is the fraction of loans collateralized by assets that are immovable for sector s and country c. Law_c is a dummy equal to one for countries above the median of the collateral law strength index and zero otherwise. REI_s is a dummy equal to one for sectors above the median of the sectoral index of real estate intensity and zero otherwise. X_s denotes a vector of sector mean firm-level controls. There are 222 country-sectors in 12 countries. The specification includes a full set of country fixed e↵ects ($\leftarrow_c$) in columns (2) and (3). Additional tests include sector fixed e↵ects ($\leftarrow_s$) in column (3). Control variables are the mean of borrower characteristics at the level of the country-sector. The standard errors are clustered at the country level.

Dep. Variable: Immovable Freq.	(1)	(2)	(3)
Law	0.059		
	(0.078)		
REI	0.084***	0.079***	
	(0.023)	(0.021)	
Law x REI	-0.105**	-0.085**	-0.084**
	(0.036)	(0.035)	(0.037)
Sector-mean Firm Controls			
Firm Ratings	Yes	Yes	Yes
Firm Size	Yes	Yes	Yes
Balance Sheet Data (4 Ratios)	Yes	Yes	Yes
Fixed E↵ects			
Country	No	Yes	Yes
Sector	No	No	Yes
Observations	222	222	222
R-squared	0.17	0.36	0.37

Table 6: Immovable Frequency and Loan-to-Value by Collateral Law Strength and Collateral Type: Supra Collateral

The table reports the frequency and loan-to-value (LTV) for loans supported with supra-collateral for 3,479 borrowers in 12 countries with weak and strong collateral laws. Strong-law countries consist of countries above the median of the collateral law strength index; weak-law countries consist of countries below the median. *Supra* collateral includes bank guarantees, financial securities, and cash held with the bank.

	(1)	(2)
	Frequency	LTV
A. Weak-law countries		
Chile	0.812	0.840
Czech Republic	0.424	0.794
India	-	-
Pakistan	0.277	0.966
Sri Lanka	-	-
Turkey	0.017	0.987
B. Strong-law countries		
Hong Kong	0.009	0.814
Hungary	0.115	0.917
Malaysia	0.546	0.770
Romania	0.829	0.802
Singapore	0.660	0.796
Slovakia	0.067	1.000
C. Average weak- and strong-law countries		
Weak-law countries	0.383	0.897
Strong-law countries	0.371	0.850

Table 7: E↵ect of Collateral Laws on Loan-to-Value: Supra Collateral

This table presents the results from the following regression:

$$LTV_i = \leftarrow_c + j3Law_c + [_1 Movable_i + [_2 Supra_i + 6_1 Law_c \leftarrow Movable_i + 6_2 Law_c \leftarrow Supra_i + \checkmark X_i + "_i,$$

where LTV_i is the loan-to-value for a loan made to firm i collateralized by assets that are immovable, movable, or supra collateral. Law_c is a dummy equal to one for countries above the median of the collateral law strength index and zero otherwise. *Movable* is a dummy variable equal to one if collateral is movable (firm assets such as equipment, machinery, and inventory). *Supra* is a dummy variable equal to one if collateral is supra (bank guarantees, financial securities, and cash held with the bank). X_i denotes a vector of firm-level controls. The sample includes 3,925 borrowers in 12 countries. The specification includes a full set of country fixed e↵ects ($\leftarrow_c$). Additional tests include sector fixed e↵ects ($\leftarrow_s$). The standard errors are clustered at the country level.

Dep. Variable: LTV	(1)	(2)	(3)
Movable		-0.292***	-0.290***
		(0.027)	(0.026)
Supra	0.060*	0.031	0.054***
	(0.033)	(0.020)	(0.009)
Law x Movable		0.211***	0.212***
		(0.030)	(0.029)
Law x Supra	-0.087**	-0.083***	-0.096***
	(0.036)	(0.023)	(0.017)
Firm Controls			
Firm Ratings	Yes	Yes	Yes
Firm Size	Yes	Yes	Yes
Balance Sheet Data (4 Ratios)	Yes	Yes	Yes
Fixed E↵ects			
Country	Yes	Yes	Yes
Sector	No	No	Yes
Observations	3,925	3,925	3,925
R-squared	0.16	0.25	0.27

Table 8: E↵ect of Collateral Laws on Loan-to-Value: Slovakia Reform

This table presents the results from the following regression:

$$LTV_{it} = \alpha_i + \alpha_t + \beta_1 Movable_i + \beta_2 Post_t \times Movable_{it} + \gamma X_{it} + \varepsilon_{it},$$

where LTV_{it} is the loan-to-value for a loan made to firm i collateralized by assets that are either immovable or movable. *Movable* is a dummy variable equal to one if collateral is movable (other firm assets such as equipment, machinery, and inventory) and zero otherwise. $Post_t$ is a dummy equal to one in all periods post January 1st 2003, the implementation date for the change in Slovakia collateral law. X_{it} denotes a vector of time varying firm-level controls. The sample in columns (1) and (2) is Slovakia only, and includes 104 borrowers for the period 2002-2004. There are 123 observations pre-reform and 184 observations post-reform. Column (3) presents results from a placebo test for all countries excluding Slovakia, and includes 3,375 borrowers in eleven countries for the period 2002-2004. The specification includes a full set of borrower fixed e↵ects (α_i) and year fixed e↵ects (α_t). In the specification presented in column (2) *Movable* is absorbed by the borrower fixed e↵ects as there are no firms in Slovakia that switch between movable and immovable collateral. The standard errors are clustered at the borrower level in columns (1) and (2) and the country level in column (3).

	(1)	(2)	(3)	(4)
		Sample		
Dep. Variable: LTV		Slovakia		Placebo
Post	-0.026**	-0.0003		
	(0.012)	(0.018)		
Movable	-0.203***			-0.135*
	(0.022)			(0.074)
Post x Movable	0.202***	0.184***	0.182***	0.011
	(0.031)	(0.050)	(0.050)	(0.013)
Firm Controls				
Firm Ratings	Yes	Yes	Yes	Yes
Firm Size	Yes	Yes	Yes	Yes
Balance Sheet Data (4 Ratios)	Yes	Yes	Yes	Yes
Fixed E↵ects				
Borrower	No	Yes	Yes	Yes
Time	No	No	Yes	Yes
Observations	307	307	307	10,705
R-squared	0.34	0.67	0.67	0.78

Table 9: E↵ect of Collateral Laws on Loan-to-Value: Robustness Checks

This table presents the results from the following regression:

$$LTV_i = \leftarrow_c + j3Law_c + [Movable_i + JLaw_c \leftarrow Movable_i + \checkmark X_i + ''_i,$$

where LTV_i is the loan-to-value for a loan made to firm i collateralized by assets that are either immovable or movable. Law_c is a dummy equal to one for countries above the median of the collateral law strength index and zero otherwise. *Movable* is a dummy variable equal to one if collateral is movable (firm assets such as equipment, machinery, and inventory) and zero otherwise. X_i denotes a vector of firm-level controls. The sample for main tests includes 3,479 borrowers in 12 countries for the period 2002-2004. The specification includes a full set of country fixed e↵ects ($\leftarrow_c$), which absorb the strength of law. Each column presents results from a di↵erent robustness test. Column 1 presents results employing an alternative definition of collateral strength (continuous index). Column 2 presents results with an alternative classification of movable/immovable assets (excluding accounts receivables). Column 3 presents results including alternative country-level characteristics GDP per Capita, Relative Tari↵, Rule of Law, and Population Density (measured as dummy variable equal to one if the characteristic is above the median). Column 4 presents results including only manufacturing firms. The standard errors are clustered at the country level.

	(1)	(2)	(3)	(4)
			Robustness	
Dep. Variable: LTV	Alternative Collateral Law	Alternative Asset Classification	Controlling for Country Characteristics	Manufacturing only
Movable	-0.415***	-0.312***	-0.277***	-0.330***
	(0.032)	(0.018)	(0.049)	(0.055)
Law x Movable	0.048***	0.235***	0.203***	0.197**
	(0.004)	(0.022)	(0.048)	(0.081)
GDP x Movable			0.027	
			(0.074)	
Relative Tari↵ x REI			0.015	
			(0.044)	
Rule of Law x REI			0.026	
			(0.098)	
Population Density x REI			-0.053	
			(0.053)	
Firm Controls				
Firm Ratings	Yes	Yes	Yes	Yes
Firm Size	Yes	Yes	Yes	Yes
Balance Sheet Data (4 Ratios)	Yes	Yes	Yes	Yes
Fixed E↵ects				
Country	Yes	Yes	Yes	Yes
Observations	3,479	3,404	3,479	1,186
R-squared	0.27	0.28	0.28	0.33

Table 10: E↵ect of Collateral Laws on Frequency of Immovable-backed Loans: Robustness Checks

This table presents the results from the following regression:

$$ImmovableFrequency_{sc} = \alpha_s + \alpha_c + \beta_1 Law_c + \beta_2 REI_s + \beta_3 Law_c \times REI_s + \gamma X_s + \varepsilon_{sc},$$

where $ImmovableFrequency_{sc}$ is the fraction of loans collateralized by assets that are immovable for sector s and country c. Law_c is a dummy equal to one for countries above the median of the collateral law strength index and zero otherwise. RE_s is a dummy equal to one for sectors above the median of the sectoral index of real estate intensity and zero otherwise. X_s denotes a vector of sector-mean firm-level controls. In the main test, there are 222 country-sectors in 12 countries for the period 2002-2004. The specification includes a full set of country fixed e↵ects (α_c), which absorb the strength of law. Each column presents results from a di↵erent robustness test. Column 1 presents results employing an alternative definition of collateral strength (continuous index). Column 2 presents results with an alternative classification of movable/immovable assets (excluding accounts receivables). Column 3 presents results including alternative country-level characteristics GDP per Capita, Relative Tari↵, Rule of Law, and Population Density (measured as dummy variable equal to one if the characteristic is above the median). Column 4 presents results including only manufacturing firms. Control variables are the mean of borrower characteristics at the level of the country-sector. The standard errors are clustered at the country level.

	(1)	(2)	(3)	(4)
			Robustness	
Dep. Variable: Immovable	Alternative Collateral Law	Alternative Asset Classification	Controlling for Country Characteristics	Manufacturing only
REI	0.152***	0.065*	0.086**	0.089**
	(0.040)	(0.030)	(0.031)	(0.034)
Law x REI	-0.023**	-0.070*	-0.112*	-0.101*
	(0.008)	(0.038)	(0.036)	(0.056)
GDP x REI			-0.207**	
			(0.083)	
Relative Tari↵ x REI			0.024	
			(0.034)	
Rule of Law x REI			0.164	
			(0.093)	
Population Density x REI			0.020	
			(0.061)	
Sector-mean Firm Controls				
Firm Ratings	Yes	Yes	Yes	Yes
Firm Size	Yes	Yes	Yes	Yes
Balance Sheet Data (4 Ratios)	Yes	Yes	Yes	Yes
Fixed E↵ects				
Country	Yes	Yes	Yes	Yes
Observations	227	221	227	107
R-squared	0.36	0.36	0.37	0.57

Table 11: E↵ect of Collateral Laws: Alternative Divisions of Sample

This table presents the results examining alternate cuto↵s for collateral law for regressions estimating loan-to-value (Table 2) and the fraction of loans collateralized by assets that are immovable (Table 5). Collateral law strength is measured into three groups, where Low denotes a collateral law strength of less than 5, Middle denotes a collateral law strength of 5 or 6, and High denotes a collateral law strength of 7. LTV_i is the loan-to-value for a loan made to firm i collateralized by assets that are either immovable or movable. *Movable* is a dummy variable equal to one if collateral is movable (firm assets such as equipment, machinery, and inventory) and zero otherwise. $ImmovableFrequency_{sc}$ is the fraction of loans collateralized by assets that are immovable for sector s and country c. REI_s is a dummy equal to one for sectors above the median of the sectoral index of real estate intensity and zero otherwise. The sample in columns (1) and (2) includes 3,479 borrowers in 12 countries. Columns (3) and (4) includes 222 country-sectors in 12 countries. The specification includes a full set of country fixed e↵ects ($\downarrow_c$) and sector fixed e↵ects ($\downarrow_s$). Control variables in columns (3) and (4) are the mean of borrower characteristics at the level of the country-sector. The standard errors are clustered at the country level.

	(1)	(2)	(3)	(4)
Dep. Variable:	LTV		Immovable Freq.	
Movable	-0.288***	-0.262***		
	(0.027)	(0.035)		
Middle Law x Movable	0.178**			
	(0.069)			
High Law x Movable	0.214***	0.187***		
	(0.029)	(0.036)		
Middle Law x REI			-0.037	
			(0.101)	
High Law x REI			-0.095**	-0.089**
			(0.035)	(0.036)
Firm Controls				
Firm Ratings	Yes	Yes	Yes	Yes
Firm Size	Yes	Yes	Yes	Yes
Balance Sheet Data (4 Ratios)	Yes	Yes	Yes	Yes
Fixed E↵ects				
Country	Yes	Yes	Yes	Yes
Sector	Yes	Yes	Yes	Yes
Observations	3,479	3,479	222	222
R-squared	0.29	0.28	0.13	0.13

Table 12: Sectoral Allocation of Output and Employment by Collateral Law Strength

The table reports the average ratio of output in immovable-intensive sectors to total output (column (1)) and the average ratio of employment in immovable-intensive sectors to total employment (column (2)), by collateral law strength. The average is taken during the period 2002-2004. Strong-law countries consist of countries above the median of the collateral law strength index; weak-law countries consist of countries below the median. Sectors intensive in real estate consist of sectors above the median of the sectoral index of real estate intensity.

	(1) Output	(2) Employment
A. Weak-law countries		
Chile	0.887	0.793
Czech Republic	0.596	0.566
India	0.686	0.616
Pakistan	-	-
Turkey	0.637	0.630
Sri Lanka	-	-
B. Strong-law countries		
Hong Kong	0.421	0.442
Hungary	0.555	0.540
Malaysia	0.483	0.433
Romania	0.617	0.524
Singapore	0.481	0.453
Slovakia	0.571	0.489
C. Average weak- and strong-law countries		
Weak-law countries	0.702	0.651
Strong-law countries	0.521	0.480
Di↵erence	0.181	0.171

Table 13: E↵ect of Collateral Laws on Sectoral Allocation of Output and Employment

The table presents the results from the following regression:

$$Share_{sc} = \alpha_s + \beta Law_c \times REI_s + \gamma X_c \times REI_s + \varepsilon_{sc},$$

where $Share_{sc}$ is the ratio of sectoral output or employment, to total output or total employment, respectively, of sector s in country c. Law_c is a dummy equal to one for countries with collateral law index above six and zero otherwise. REI_s is a dummy equal to one for sectors above the median of the sectoral index of real estate intensity and zero otherwise. X_c is a vector of country-level controls. The specification includes a full set of sector fixed e↵ects (α_s). The sample includes 10 countries. The standard errors are clustered at the country level.

	(1)	(2)	(3)	(4)
	Output		Employment	
Strength Law x REI	-0.014**	-0.015***	-0.013**	-0.017***
	(0.005)	(0.003)	(0.005)	(0.004)
GDP per Capita x REI		-0.005		-0.010
		(0.005)		(0.006)
Relative Tari↵ x REI		0.018***		0.023**
		(0.005)		(0.007)
Rule of Law x REI		-0.012***		-0.009**
		(0.003)		(0.004)
Population Density x REI		-0.013***		-0.014**
		(0.003)		(0.005)
Fixed E↵ects				
Sector	Yes	Yes	Yes	Yes
Number of countries	10	10	10	10
Observations	220	220	220	220
R-squared	0.373	0.381	0.355	0.369

Table 14: E↵ect of Collateral Laws on Sectoral Allocation of Output and Employment: Extended Sample

The table presents the results from the following regression for the extended sample:

$$Share_{sc} = \downarrow_s + (3Law_c \leftarrow REI_s + \checkmark X_c \leftarrow REI_s + \text{✏}_{sc},$$

where $Share_{sc}$ is the ratio of sectoral output, employment, or number of establishments to total output, total employment, or total number of establishments, respectively, of sector s in country c. Law_c is a dummy equal to one for countries with collateral law index above six and zero otherwise. REI_s is a dummy equal to one for sectors above the median of the sectoral index of real estate intensity and zero otherwise. X_c is a vector of country-level controls. The specification includes a full set of sector fixed e↵ects ($\downarrow_s$). The samples for the output, employment, and establishments regressions include 86, 80, and 41 countries, respectively. The standard errors are clustered at the country level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Output		Employment		Establishments	
Law x REI	-0.007**	-0.007**	-0.007*	-0.007*	-0.017***	-0.015***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
GDP per Capita x REI		0.000		0.002		0.004
		(0.002)		(0.003)		(0.003)
Relative Tari↵ x REI		0.015***		0.014*		-0.005
		(0.005)		(0.007)		(0.004)
Rule of Law x REI		-0.004		-0.001		0.004**
		(0.004)		(0.006)		(0.002)
Population Density x REI		-0.007		-0.008		0.000
		(0.005)		(0.007)		(0.000)
Fixed E↵ects						
Sector	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	86	86	80	80	41	41
Observations	1,892	1,892	1,595	1,595	830	830
R-squared	0.479	0.479	0.379	0.380	0.621	0.621