Foreign and Domestic Loans over the Business Cycle

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Abstract

During good economic times, the probability of domestic firms to obtain loans from foreign banks increases in the firm's opacity. During bad economic times (recessions), this relation reverses as foreign lending drops disproportionately more in the case opaque borrowers. Furthermore, the probability of obtaining a foreign loan decreases for all firms during recessions while firms with a high share of foreign sales are more likely to obtain a loan from foreign bank. We derive these predictions in a formal theoretical framework and confirm them in a global dataset at the loan-bank-firm level for 40 countries during the period 1999-2016.

Keywords: foreign banks, cross-border loans, business cycles

JEL codes: G21, E44, F65

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1 Introduction

Due to the increasing financial and economic integration in recent decades, loans from foreign banks have become an ever more important source of funding. Claessens (2017) shows that the market share of foreign banks exceeded 50% in 63 out of 118 countries in 2007. Foreign loans declined during the financial crisis and the subsequent sovereign debt crisis in Europe, but the foreign bank presence has continued to grow in emerging and developing countries over the past ten years, having potentially far-reaching consequences for borrowers' credit access, financial stability, and economic growth. A useful first step towards a better understanding of these aggregate economic effects would be to look at what is happening at the firm level. In particular, we know very little about why some loans to domestic firms are provided by domestic banks and others by foreign banks.

The aim of this paper is to examine both theoretically and empirically if a loan will be made between a firm and a domestic or foreign bank, based on both the stage of the business cycle and the opacity of the borrowing firm. In our Hotelling (1929)-type theoretical framework, each potential borrower has a project that can either be successful or unsuccessful. The true success probability is related to a local macroeconomic factor and a local taste shock. The local macroeconomic factor is easily observable and captures the prevailing economic conditions in domestic economy (e.g., GDP growth), while the local taste shocks are prohibitively costly to observe for agents located outside the domestic economy. Domestic borrowers differ in their levels of exposure both to the changes in the macroeconomic factor and to the local taste shocks. Domestic banks can perfectly

observe both types of shocks while foreign banks cannot observe the local taste shocks and therefore overreact to the changes in the local macroeconomic factor.

For a reasonable range of parameter values, our model predicts that foreign banks get matched with fewer borrowers during bad times (characterized by low values of the macroeconomic factor) and with more borrowers during good times (characterized by high values of the macroeconomic factor), compared to the domestic banks. Moreover, during bad times, foreign banks are matched to a larger extent with low-opacity borrowers, and during good times, they get matched to a larger extent with high-opacity borrowers. We confirm these theoretical predictions also empirically, using a loan-level dataset with identified borrowers and lenders covering 40 countries during the period from 1999 to 2016.

Our paper contributes to an important but still relatively small empirical literature on how cross-border loans and the presence of foreign banks affect domestic borrowers and their access to debt financing (e.g. Mian (2006), Detragiache, Tressel, and Gupta (2008); Giannetti and Ongena (2009) Giannetti and Ongena (2012); Bruno, Hauswald, et al. (2014); Bremus and Neugebauer (2018)). The existing empirical results point in different directions - for example, Giannetti and Ongena (2009) and Giannetti and Ongena (2012) find positive effects of foreign loans, however mainly for larger companies, while smaller companies only get indirect benefits from increased competition in the banking sector. In contrast, Detragiache, Tressel, and Gupta (2008) find that countries with a large foreign bank presence have both a less developed loan market and a worse access to loan financing for small companies. Most of the studies on interactions between foreign banks

and domestic borrowers lack disaggregated loan-level data, or they focus on borrowers from a single large country or a selected group of smaller countries. By contrast, we rely on a new global dataset at the loan-bank-firm level introduced by Forssbæck, Lundtofte, Strieborny, and Vilhelmsson (2018).

Our paper further contributes to existing literature by providing a theoretical framework that could guide further empirical work on the interactions between domestic firms and foreign and domestic banks. On one hand, the previous theoretical literature contains only a few contributions employing a Hotelling (1929)-type approach to lender-borrower matching and focuses on competition among lenders (banks), while our focus is on the individual borrower's matching with a (domestic or foreign) lender, based on her characteristics. On other hand, the existing literature on cross-border banking has a very clear empirical focus, often lacking a formal theoretical framework. Subsection 2.1 provides more details by placing our theoretical approach into the context of existing literature.

The rest of the paper is organized as follows. Next section introduces our theoretical framework. Section 3 and Section 4 describe our empirical strategy and empirical results, respectively. Section 5 concludes.

2 Theoretical Framework

In our theorectial framework formally presented in the subsection 2.2, we build on the classic Hotelling (1929) model where repayments from borrowers are not certain. In the model, there are two groups of lenders, domestic and foreign, located at 0 and 1,

respectively, on a line segment. For simplicity, we assume that there is perfect within-group competition among lenders. Each potential borrower is a penniless entrepreneur with a project that can either be successful or unsuccessful. The true success probability is related to a local macroeconomic factor and a local taste shock. While the domestic lenders can observe both of these drivers of borrowers' success, it is prohibitively costly for the foreign lenders to observe the local taste shock. The foreign lenders therefore rely on a standard model without the local taste shock and later correct for the resulting omitted variables bias. We use the exposure to the local taste shock as a measure of borrower opacity. The foreign lenders think that the exposures to the local taste shocks are symmetrically (uniformly) distributed around a mean of zero when they are in fact positive. Since the corrections are then on average biased downwards, the foreign lenders' expectations on the exposures to the local macroeconomic shock are biased upwards. Consequently, the foreign lenders overreact to changes in the local macroeconomic factor.

Subsection 2.1 puts the model into the context of existing theoretical literature that so far contains only a few contributions employing a Hotelling (1929)-type approach to lender-borrower matching and focuses mostly on competition among lenders rather than an individual borrower's matching with a domestic or foreign lender. Subsection 2.3 provides graphical representation of a numerical simulation with reasonable values of model's parameters. This parametric version of the model yields two empirically testable predictions. First, the probability of taking a a foreign loan is smaller for all borrowers during bad economic times, i.e. when a local macroeconomic factor takes low values. Second, the relation between borrower's opacity and the probability of obtaining a foreign loan

changes depending on the value of the local macroeconomic factor. When the macroeconomic factor takes high values ("good economic times"), the probability of obtaining foreign loan is increasing in borrower's opacity. When the macroeconomic factor takes low values ("bad economic times"), the probability of obtaining foreign loan is decreasing in borrower's opacity.

2.1 Existing literature and theoretical contribution

Wong and Chan (1993) merge the theories of financial intermediation and optimal contracting with the standard Hotelling (1929) model. They show that, in an unregulated market, there is too little investment and too much costly monitoring. One of their key assumptions is that banks' monitoring costs are increasing in the distance between the entrepreneur and the bank, while we impose search costs on the borrowers. Matutes and Vives (1996) present a model in which banks compete for depositors and the economy in their model exhibits fragility due to a coordination failure among depositors and not bank competition. In a variety of settings in which banks are also effectively competing for depositors, but where bank competition may cause financial instability, Allen and Gale (2004) demonstrate that the relationship between competition and financial stability is far more complex than just a simple trade-off. In their paper, there is a subsection (Section 3.2), in which they specifically apply Hotelling's (1929) framework. The main finding in that subsection is that the existence of a trade-off between competition and financial stability depends on which locations a bank is allowed to occupy.

Heddergott and Laitenberger (2017) develop a model in which small and large banks compete for transparent and opaque borrowers, and they analyze the relation between credit access and bank competition, finding that this relation depends on the degree of heterogeneity in the banking market. In their paper, they call borrowers for which the project returns are certain "transparent borrowers" and, consequently, they call borrowers for which the project returns are uncertain "opaque borrowers." In contrast, in our model, we define borrower opacity based on the success probabilities' loading on a local taste shock that is not observed by the foreign lenders and thus, we allow for various degrees of opacity. Overall, as compared to the above-cited theory articles, we allow for a much greater degree of heterogeneity among borrowers, while assuming perfect within-group competition among domestic and foreign lenders, respectively.

Bank entry in foreign markets has also been analyzed from other perspectives and with other aims by, e.g., Detragiache, Tressel, and Gupta (2008) and Niepmann (2015). Detragiache, Tressel, and Gupta (2008) develop a model with asymmetric information to analyze how foreign bank entry affects financial sector development in poor countries. They show that the entry of foreign banks might lead to welfare losses because the foreign banks may drive out the domestic banks and as a result, opaque domestic firms become credit constrained. Niepmann (2015) builds an international trade-type model to explain various patterns in cross-border lending, e.g., heterogeneity in funding models, and that more efficient banking sectors hold more foreign assets and foreign liabilities in countries with less efficient banking sectors. Also in her model, financial liberalization and openness do not always produce the most desirable outcomes: she shows that when a capital scarce

country liberalizes its banking sector, it can experience a capital outflow, and this can of course be detrimental to domestic firms. Though her model features an exogenously given function intended to capture monitoring costs, she does not model information asymmetries explicitly.

2.2 A formal model

In our model, lenders and borrowers are risk-neutral and maximize expected profits. The borrowers consist of a continuum of penniless entrepreneurs with a total mass of one, uniformly distributed on the [0,1] interval and each with a project with independently and identically distributed payoffs $\tilde{Y}_i$ and unit cost. Depending on whether a project is successful or unsuccessful, $\tilde{Y}_i$ can either take on a value of $y > 0$ with probability p_i or value 0 with probability $(1 - p_i)$.

Situated at 0, there is a large number of domestic lenders in perfect competition and, correspondingly, at 1, there is a large number of foreign lenders in perfect competition. For simplicity, we assume that the lenders' opportunity cost of capital is zero. The true success probability of borrower i is related to a well-known factor f capturing local macroeconomic conditions, and a local taste shock ϑ,

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_i f + \gamma_i \vartheta + \epsilon_i, \tag{1}$$

where both f and ϑ have zero expectation ($E[f] = E[\vartheta] = 0$), β_i and γ_i denote project-specific sensitivities towards the factor (f) and the local shock (ϑ), respectively, and

$\epsilon_i \sim N(0, \sigma_\epsilon^2)$ is a random noise term, independent of f and ϑ. Further, the vector (f, ϑ) follows a bivariate normal distribution, where the local taste shock (ϑ) has a coefficient of correlation of ρ with the macroeconomic factor f. For simplicity, we assume that $\ln(p_i/(1-p_i))$ has an expectation of zero.

The domestic lenders know the predictive relation in (1), including the true values of β_i and γ_i, whereas the foreign lenders observe f and know that the true success probability follows (1). However, foreign lenders do not know β_i, γ_i, and it is too costly for them to observe the local taste shock ϑ. Further, for mathematical tractability, we assume that the foreign lenders know the correlation between f and v (ρ), the standard deviation of ϑ (σ_ϑ) and the standard deviation of f (σ_f). For consistency, we also assume that it is too costly for the foreign lenders to learn the variance of the dependent variable $Var[\ln(p_i/(1-p_i))]$. In order to estimate the sensitivity to f, the foreign lenders run OLS regressions of the type

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_i f + \eta_i, \tag{2}$$

and they can conclude that $(\eta_i|\gamma_i)$ is normally distributed with an expectation of zero and variance

$$\sigma^2_{\eta_i|\gamma_i} = Var\left[\gamma_i\vartheta + \epsilon_i\right] = \gamma_i^2\sigma_\vartheta^2 + \sigma^2_{\epsilon_i}, \tag{3}$$

The foreign lenders are aware that their OLS estimate $\hat{\beta}_i^F$ is biased,

$$\hat{\beta}_i^F = \frac{Cov\left(\ln(p_i/(1-p_i)), f\right)}{Var[f]} = \beta_i + \gamma_i\rho\frac{\sigma_\vartheta}{\sigma_f}, \tag{4}$$

and they understand that given knowledge of γ_i, they can arrive at the true value of β_i by subtracting $\gamma_i \rho \sigma_\vartheta / \sigma_f$ from their estimate $\hat{\beta}_i^F$. However, the foreign lenders do not know γ_i and perceive it as being uniformly distributed on $[-\delta, +\delta]$ for all i.

The borrowers' transaction costs are linear in the distance to the lender. For a borrower situated at $x \in [0, 1]$, the transaction cost amounts to tx if she borrows from a domestic lender and $t(1 - x)$ if she borrows from a foreign lender, with $t > 0$.

Lenders offer interest rates to borrowers secretly and simultaneously. Due to perfect competition within each group of lenders and their risk neutrality, interest rates are set such that lenders' expected profit from each loan is equal to zero. Borrowers pick a lender whose offer represents the lowest sum of interest rate and transaction costs. We assume that it is too costly for lenders to collect information on borrowers' historical interest rates if they borrowed from another lender.

As it turns out, expected profits are related to expectations of sigmoids of normally distributed random variables. In the following lemma, we show that, with a slight correction, these can be approximated by sigmoids evaluated at expected values.

Lemma 1. *Suppose $X \sim N(\mu, \sigma^2)$. Then, the expectation of a sigmoid function $E[s(X)]$, where $s(w) = 1/(1 + e^{-w})$ can be approximated by a sigmoid function*

$$E[s(X)] \approx s\left(\frac{\mu}{\sqrt{1 + \frac{\pi}{8}\sigma^2}}\right). \tag{5}$$

Proof: see Appendix

As follows from the model description above, lenders offer interest rates to borrowers

who in turn accept the offer with the lowest sum of interest rate and transaction costs. Since lenders within each group (domestic, foreign) are in perfect competition, their offered interest rates are such that they yield zero expected profits. In the proposition below, we approximate the border between borrowers who take up a domestic loan and those who take up a foreign loan. In cases where the lenders' offers are deemed equally good by the borrowers, we assume that borrowers take up a domestic loan.

Proposition 1. *The border between borrowers who take up a domestic loan and those who take up a foreign loan can be approximated by the surface*

$$t(1-2x_i) - \frac{1}{\frac{1}{2\delta}\int_{-\delta}^{+\delta} s\left(\frac{\left(\hat{\beta}_i^F - z_i\rho\frac{\sigma_\vartheta}{\sigma_f}\right)f}{\sqrt{1+\frac{\pi}{8}\left(z_i^2\sigma_\vartheta^2+\sigma_{\epsilon_i}^2\right)}}\right)dz_i} + \frac{1}{s\left(\frac{(\beta_i f+\gamma_i\vartheta)}{\sqrt{1+\frac{\pi}{8}\sigma_{\epsilon_i}^2}}\right)} = 0, \tag{6}$$

where those for which the value of the above expression is weakly negative (≤ 0) *take up a domestic loan whereas those for which the value of the above expression is strictly positive* (> 0) *take up a foreign loan, and* s *denotes a so-called sigmoid function;* $s(w) = 1/(1+e^{-w})$.

Proof: see Appendix

2.3 Parametrization and testable predictions

Figure 1 depicts (our approximations of) the borders between the two groups of borrowers in the (x_i, γ_i)-plane in the cases when $f = +0.25$, $f = +0.1$, $f = -0.1$ and $f = -0.25$,

respectively, holding ϑ constant at its expected value ($\vartheta = E[\vartheta] = 0$).[1] When $f = \vartheta = 0$, the two groups of lenders are effectively identical, and so, as is commonly the case in Hotelling-type models with identical sellers, they split the market equally ($x_i = 1/2$). This equal split can be formally verified by plugging $f = \vartheta = 0$ into Equation (6). However, when $f \neq 0$ and $\gamma_i \neq 0$, the lenders are no longer identical, and the "less similar" they are, the more they depart from the equal split. f can be interpreted in terms of a macroeconomic growth factor, e.g., GDP growth. Suppose γ_i is positive, as in Figure 1. Then, γ_i can be interpreted in terms of borrower's opacity since it measures the magnitude of the borrower's exposure to a local taste shock (ϑ) that is not observed by the foreign lenders. Note that, since we hold ϑ constant at zero throughout the exercise, γ_i does not affect the true success probability in (1).

[Insert Figure 1 about here]

It does, however, affect the conditionally expected success probability in the view of the foreign lenders in (21). From Figure 1 we see that, as we increase the magnitude of negative macroeconomic shocks (i.e., as f gets increasingly negative), the foreign lenders decrease their total exposure (market share), whereas the domestic lenders increase theirs. Further, the foreign lenders decrease their exposure towards more opaque borrowers to a larger extent as compared to less opaque borrowers. The opposite effects (although not entirely symmetric) occur if we instead consider positive macroeconomic shocks.

[1] Other parameter values are $\beta_i = 0.5$, $\rho = 0.3$, $\sigma_\vartheta = 0.3$, $\sigma_f = 0.3$, $\sigma_{\epsilon_i} = 0.2$, $t = 0.05$, and $\delta = 1$.

3 Empirical Approach

3.1 Data

Our primary source of data is the newly constructed loan-borrower-lender dataset from Forssbæck, Lundtofte, Strieborny, and Vilhelmsson (2018). The unit of observation in the dataset is a loan with loan characteristics from Thomson Reuters/LPC's DealScan database (Dealscan). Borrower characteristics are taken from S&P Compustat/Capital IQ (CIQ). Dealscan is a global database comprising detailed information on mostly large and often syndicated corporate loans, with the loan-level information including borrower's ID, lender's ID, loan purpose, loan amount, interest rate, maturity, covenants, performance pricing information, et cetera. It has been used in academic research by Ivashina, Scharfstein, and Stein (2015) and Sufi (2007) among many others. DealScan does not contain any company identifier that is common with any standard database but Forssbæck, Lundtofte, Strieborny, and Vilhelmsson (2018) matches each company in DealScan to Compustat/Capital IQ allowing us to extract accounting information for each borrower.

There are three key advantages of this dataset compared to, e.g., the matching done by Chava and Roberts (2008). For once, our dataset includes also lenders whereas Chava and Roberts (2008) only match borrowers. Furthermore, each loan in our dataset is classified not only as being foreign or domestic but also if the foreign loan is made directly by a foreign bank (a direct cross-border loan), by a subsidiary of a foreign bank, or by a branch of a foreign bank. Finally, the dataset also tracks the immediate parent and the global ultimate owner of the lender over time which is necessary to properly classify a loan as

being domestic or foreign. For more details on the construction of the dataset, the reader is referred to Forssbæck, Lundtofte, Strieborny, and Vilhelmsson (2018).

To capture a negative shock to the domestic firms, we add a recession dummy for the borrower country that takes the value one if the loan was originated during a month classified as a recession by the recession indicators available from the FRED database at the Federal Reserve Bank of St. Louis. This restricts our sample to the 40 countries that include both OECD members and several large emerging countries.[2] Since we want to cleanly identify negative macroeconomic shocks to the domestic borrower rather than to the foreign lender, we exclude observations on foreign loans if there is a simultaneous recession in both the borrower and the lender country. We also exclude loans where the borrower is from the USA, as the local taste shocks might be easily observable for foreign lenders in this case. We use country-pairs information on common language, geographical distance, colonial relationships, and shared border from Mayer and Zignago (2011).

As can be seen from Table 1, restricting ourselves to the 40 countries in our sample gives only a relatively small reduction in the number of included loans from 14,523 to 12,655. We can further see that the average size of the borrowers is roughly the same, with 12,280 million USD for all countries and 13,765 million USD for the countries in our sample. Our borrowers are on average a lot larger than for example the borrowers in Giannetti and Ongena (2012), who investigate mainly unlisted firms in developing

[2]The countries are: Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, South Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Slovakia, the United Kingdom and the United States.

countries with an average size of 36 million USD. Overall, our borrower characteristics are almost unchanged by restricting ourselves to the 40 countries in our sample. For example, the percentage of listed firms (93 percent) is the same in both samples. Also loan characteristics are similar with the average loan size being 416 million USD for all countries and 549 million USD for countries in our sample. Almost all the loans (95 percent in both samples) are syndicated, few (14 percent among all countries and 15 percent among countries in our sample) have performing pricing provisions and relatively few (21 percent among all countries and 17 percent among countries in our sample) are collateralized.

Our sample period covers the period from 1999 to 2016. Although DealScan does have loans starting already in 1986, its international coverage is not comprehensive until the late 1990s.

[Insert Table 1 about here]

3.2 Estimation strategy

Our overall aim is to determine how the propensity of a firm to take a foreign loan depends both on the closeness of the firm to foreign banks (proxied by the borrower's share of foreign sales) and on the opacity of the borrower (proxied by the share of intangible assets in the main specifications). Further we want to investigate if the effect of borrower's opacity varies with economic conditions (proxied by the recession dummy). We achieve this by regressing a binary variable that takes the value of one for foreign loans and zero for

domestic loans on the above mentioned variables as well as the interaction between opacity and the recession dummy. The regressions also include a number of firm-specific controls (total assets, total asset growth, return on assets, leverage, market-to-book, RD expenses) as well as dummy variables for the following borrower and loan characteristics: listed firms, high-tech firms, syndicated loans, collateralized loans, and loans in the borrower's home currency. To be able to calculate marginal effects of the interaction terms and to include various fixed effects, we run linear probability models like Giannetti and Ongena (2012) even though the dependent variable is binary.

We define a loan as being foreign in two different ways. A loan is foreign if the lender, the lender's parent, or lender's global ultimate owner is domiciled in a different country than the borrower at the time the loan was given. We define a loan as a *direct* cross-border loan if the lender is domiciled in a different country than the borrower at the time the loan was given. We use two different sets of fixed effects. Reduced fixed effects include fixed effects for 1-digit SIC industry, Year, Loan type, Loan purpose, and Borrower region. The borrower region fixed effects are dummy variables for each of the World Bank's geographical regions based on the borrower firm's home country.[3] Full fixed effects use all the reduced fixed effects, with Lender country and Borrower country fixed effects replacing the fixed effects for World Bank's geographical regions. Additionally, they also include fixed effects for 2-digit SIC Industry codes. All standard errors are clustered at the borrower-country level.

[3]The regions are Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, North America, South Asia and Sub-Saharan Africa.

4 Results

The parametric version of the model predicts that: 1) the probability of taking a foreign loan is smaller for all companies in recessions, 2) the probability of taking a foreign loan should decrease in the borrowing firm's opacity during recessions and increase during good economic times. The model also implies that 3) the probability of taking a foreign loan is increasing in the "closeness" of a borrower to foreign rather than domestic banks due to lower transaction costs.

In the main results, we measure the borrowing firm's opacity by the share of intangible assets. In a series of robustness test reported in Subsection 4.2, we use an indicator variable equal to one for high-tech firms and the ratio of of R&D expenditure to total revenue as two alternative measures of opacity. We proxy the closeness of a firm to foreign banks by the borrowing firm's share of foreign sales.

4.1 Main results

Table 2 reports our main results. The odd-numbered columns report the results when using a reduced set of fixed effects while the even-numbered columns report results for specifications using a full set of fixed effects. Columns 1 to 4 report results for the sample including all borrowing firms and columns 5 to 8 report results for the subsample of listed borrowers. Columns 1-2 and 5-6 report results for sample including all foreign loans. Columns 3-4 and 7-8 report results for estimations focusing on the subsample of direct cross-border loans.

[Insert Table 2 about here]

A clear result across specifications in Table 2 is that the propensity to take a foreign loan is considerably smaller (about 8 percentage units with full fixed effects and 15 percentage units with reduced fixed effects) ($p < 0.01$) during recessions. This effect is large given that the unconditional probability of a foreign loan is 33 percent for all cross-border loans and 31 percent for direct cross-border loans. Also in agreement with the theoretical predictions, we find that the share of foreign sales is a strong predictor ($p < 0.01$) for the probability of taking a foreign loan. The propensity to take a foreign loan is smaller during recessions for opaque firms with the interaction between the share of intangible assets and the recession dummy being negative ($p < 0.1$). During normal times, the probability of a cross-border loan is increasing in opacity, with significant results for all specifications with full fixed effects. Based on specification 4 in Table 2, a one standard deviation increase in opaqueness during recessions decreases the probability of obtaining a foreign loan by 2.4 percentage units showing that the economic importance of opacity is roughly equal to the effect of firm size.

Figure 2 shows the probability of getting a foreign loan calculated from specification 4 for different levels of intangibles during recessions and normal times, with all other variables set to their average values. The results in Figure 2 correspond closely to the theoretical prediction depicted in Figure 1. The difference in market share during good economic times and bad economic times given by the different borders in Figure 1 (e.g. for $f = +0.1$ and $f = -0.1$) correspond to the vertical distance between non-recessions

and recessions in Figure 2. This distance is both statistically significant and economically important. In particular, the market share of domestic banks is about 35% during non-recessions and 25% during recessions, implying a recession-driven decrease in market share of foreign banks of 28.6% (10 percent divided by 35 percent). The slopes in Figure 1 also predict that foreign market share should be increasing in opacity during good economic times and decreasing during recessions, which is exactly what we see in Figure 2. For the most opaque firms, the loss in market share for foreign banks is from around 37% to less than 25% whereas for the most transparent firms the corresponding drop is from around 34% to 27%.

[Insert Figure 2 about here]

The results for listed and non-listed firms are generally very similar. The same applies also for all foreign loans compared to the case when only direct cross-border loans are included. The small difference between all foreign loans and direct cross-border loans is probably due to the small number (343) of loans by branches and subsidiaries of foreign banks. In agreement with Mian (2006) and Gianetti and Ongena (2012), we find that the probability of taking a foreign loan is increasing in the size of the borrower. Giannetti and Ongena (2012) find an increase with 3 percent units for a one standard deviation increase in the log of total assets and interestingly we find a very similar effect (3.5% with full fixed effects and 2.6% with reduced fixed effects) even though Giannetti and Ongena (2012) look at much smaller firms in developing countries.

4.2 Alternative measures of opacity

In the above results, our proxy for opacity has been the share of intangible assets to total assets. To ascertain the robustness of our results to alternative proxies for opacity, we run in Table 3 a set of regressions with full fixed effects, alternating specifications for both all firms and non-listed firms only, as well as specifications for both all foreign loans and direct cross-border loans.

[Insert Table 3 about here]

In specifications 1, 3, 5 and 7 of Table 3, we use an indicator variable that is equal to one if a firm is "high-tech" as our proxy for opacity. During recessions, the probability of getting a foreign loan is 3-4% lower for high-tech firms depending on specification (the effect is somewhat larger for listed firms), which is about the same magnitude as we found with the share of intangible assets. In specifications 2, 4, 6 and 8, we instead use the ratio of R&D expenditure to total revenue as our opacity measure, and we again find a significant effect for the interaction term of opacity with the recession dummy. Using this measure, we find that during recessions the probability of a foreign loan is 1.4% lower for a one standard deviation increase in R&D expenditure to total revenue when using all foreign loans and 1.0% lower for direct cross-border loans.

4.3 The effect of distance

A central idea in Mian (2006) is that if the headquarters of a foreign bank and the local loan officer (in Mian's dataset foreign loans are made by local branches in Pakistan)

are distant from each other then it becomes harder for the foreign bank to take soft information into account. Hence, the opacity of the firm should be increasingly important for borrower-lender pairs that are distant from each other. Distance in this context can be geographical, cultural or institutional. If that is indeed the case, our model should work even better (opacity being even more important) for country pairs that are far from each other. We test this by excluding foreign loans from borrower-lender country pairs that are in some sense close to each other.

[Insert Table 4 about here]

Specification 1 of Table 4 repeats the main results for convenience (all foreign loans with full fixed effects), specification 2 excludes loans from borrower-lender country pairs who have a geographical distance smaller then the median distance for cross-border loans, specification 3 excludes cross-border loans from borrower-lender country pairs who share a common language, specification 4 exclude loans from borrower-lender country pairs that are contiguous (share a border), specification 5 exclude loans from borrower-lender country pairs that have had a colonial relationship from 1945 or more recently, and specification 6 excludes all loans that were excluded in any of specifications 2 to 5. Overall, we do not find support for intangibility becoming more important for loans between distant borrower-lender pairs. During non-recessions, the share of intangible assets is somewhat more important when we exclude foreign loans between countries sharing a common border and between countries that share a common language. However, during recessions the importance of intangible assets actually decreases except when country pairs sharing a

colonial relationship are excluded.

5 Conclusions

Lending behavior of foreign banks evolves over the business cycles differently than the lending of domestic banks does. During good economic times, foreign banks are disproportionately more likely to provide loans to opaque borrowers. During bad economic times, foreign lending decreases more dramatically than lending by domestic banks, causing a decrease in the probability of obtaining a foreign loan for all domestic firms. Moreover, foreign lending drops disproportionately more in case of opaque firms. Consequently, during bad economic times the probability of obtaining a foreign loan is actually decreasing in the opacity of the borrower, the opposite result to the one during good economic times.

We derive these results in a formal theoretical framework inspired by Hotelling (1929), showing how an information asymmetry between domestic and foreign banks regarding local taste shocks can lead foreign lenders to overreact to changes in an easily observable local macroeconomic factor (e.g., GDP growth). Given the standard Hotelling (1929)'s style theoretical framework, our model also implies that firms that are "closer" to foreign banks are more likely to obtain a loan from them due to the lower transaction costs.

We test the predictions of the model in a global dataset at the loan-bank-firm level for 40 countries during the period 1999-2016, using recession indicators as proxy for low levels of a local macroeconomic factor. Our results confirm that the probability of obtaining foreign loan decreases during the recession in the borrower's country and it

does so disproportionately more so for opaque firms. We define opaque firms as firms with a high share of intangible assets, firms from the high-tech sectors, and firms with a high share of expenses on research and development. We also confirm that firms "closer" to foreign lenders have a higher probability of obtaining a foreign loan, using the share of foreign sales at the firm level as proxy for firm's closeness to foreign banks.

Appendix

Proof of Lemma 1

Proof. It is well-known in the machine learning literature that the sigmoid function can be approximated by the c.d.f. of a standard normal (see, e.g., Bishop, 2006, Ch. 4.5.2),

$$s(w) \approx \Phi(\xi w), \tag{7}$$

where we pick ξ such that $\xi^2 = \frac{\pi}{8}$ to equalize slopes at the origin.

Thus, we have that

$$E[s(X)] = \int_{-\infty}^{+\infty} s(w) f_X(w) dw \approx \int_{-\infty}^{+\infty} \Phi(\xi w) f_X(w) dw = \Phi\left(\frac{\xi\mu}{\sqrt{1+\xi^2\sigma^2}}\right), \tag{8}$$

where the last equality follows from observing that if Y and Z are independently distributed as $Y \sim N(0,1)$ and $Z \sim N(a, b^2)$, respectively, then

$$Prob\left(Y \leq \xi Z | Z = w\right) = Prob(Y \leq \xi w) = \Phi(\xi w). \tag{9}$$

By the law of total probability,

$$Prob(Y \leq \xi Z) = \int_{-\infty}^{+\infty} \Phi(\xi w) f_Z(w) dw. \tag{10}$$

On the other hand, we have that

$$Prob(Y \leq \xi Z) = Prob(Y - \xi Z \leq 0) = \Phi\left(\frac{\xi a}{\sqrt{1+\xi^2 b^2}}\right). \tag{11}$$

Therefore, it must be that

$$\int_{-\infty}^{+\infty} \Phi(\xi w) f_Z(w) dw = \Phi\left(\frac{\xi a}{\sqrt{1+\xi^2 b^2}}\right). \tag{12}$$

Finally, we approximate $\Phi\left(\frac{\xi\mu}{\sqrt{1+\xi^2\sigma^2}}\right)$ in Equation (8) by $s\left(\frac{\mu}{\sqrt{1+\xi^2\sigma^2}}\right)$ and insert $\xi^2 = \pi/8$ (to equalize slopes at the origin in the approximation in (7)), from which the result follows.

□

Proof of Proposition 1

Proof. By assumption, lenders' opportunity cost of capital is zero. Hence, the domestic and foreign lenders' expected profits from a loan to borrower i, located at x_i, are given by

$$\Pi_i^D = E^D[p_i] r_{D,i} - (1 - E^D[p_i]) \cdot 1 \tag{13}$$

and

$$\Pi_i^F = E^F[p_i] r_{F,i} - (1 - E^F[p_i]) \cdot 1, \tag{14}$$

respectively.

Due to perfect competition within each group of lenders, the lenders' offered interest rates can be found by putting their expected profits equal to zero. The resulting interest rates are

$$r_{D,i} = \frac{1}{E^D[p_i]} - 1 \tag{15}$$

and

$$r_{F,i} = \frac{1}{E^F[p_i]} - 1. \tag{16}$$

Borrower i's decision is based on

$$Min\left\{r_{D,i} + tx_i, r_{F,i} + t(1-x_i)\right\} = Min\left\{\frac{1}{E^D[p_i]} - 1 + tx_i, \frac{1}{E^F[p_i]} - 1 + t(1-x_i)\right\}. \tag{17}$$

Solving for p_i in Equations (1) and (2), we get that, from the perspective of the domestic lenders, p_i follows the same distribution as

$$p_i = \frac{1}{1 + e^{-\beta_i f - \gamma_i \vartheta - \epsilon_i}}, \tag{18}$$

whereas, from the perspective of the foreign lenders, conditional on $\gamma_i = z_i$, p_i has the same distribution as

$$p_i = \frac{1}{1 + e^{-\left(\hat{\beta}_i^F - z_i \rho \frac{\sigma_\vartheta}{\sigma_f}\right) f - z_i \vartheta - \epsilon_i}}. \tag{19}$$

We note that the domestic lenders view (18) as being a sigmoid of a normally distributed random variable and that conditional on $\gamma_i = z_i$, foreign lenders view (19) as a

sigmoid of a normally distributed random variable. Thus, it follows from Lemma 1 that

$$E^D[p_i] \approx s\left(\frac{(\beta_i f + \gamma_i \vartheta)}{\sqrt{1+\frac{\pi}{8}\sigma^2_{\epsilon_i}}}\right) \tag{20}$$

and

$$E^F[p_i|\gamma_i = z_i] \approx s\left(\frac{\left(\hat{\beta}^F_i - z_i\rho\frac{\sigma_\vartheta}{\sigma_f}\right) f}{\sqrt{1+\frac{\pi}{8}\left(z_i^2\sigma^2_\vartheta + \sigma^2_{\epsilon_i}\right)}}\right). \tag{21}$$

By the law of iterated expectations and the perceived uniform distribution of γ_i on $[-\delta, +\delta]$, we have that

$$E^F[p_i] = E^F[E^F[p_i|\gamma_i = z_i]] \approx \frac{1}{2\delta}\int_{-\delta}^{+\delta} s\left(\frac{\left(\hat{\beta}^F_i - z_i\rho\frac{\sigma_\vartheta}{\sigma_f}\right) f}{\sqrt{1+\frac{\pi}{8}\left(z_i^2\sigma^2_\vartheta + \sigma^2_{\epsilon_i}\right)}}\right) dz_i. \tag{22}$$

The proposition then follows from inserting Equations (20) and (22) into the expression in (17) and the assumption that in the case of equally good offers, borrowers take up a loan from a domestic lender.

□

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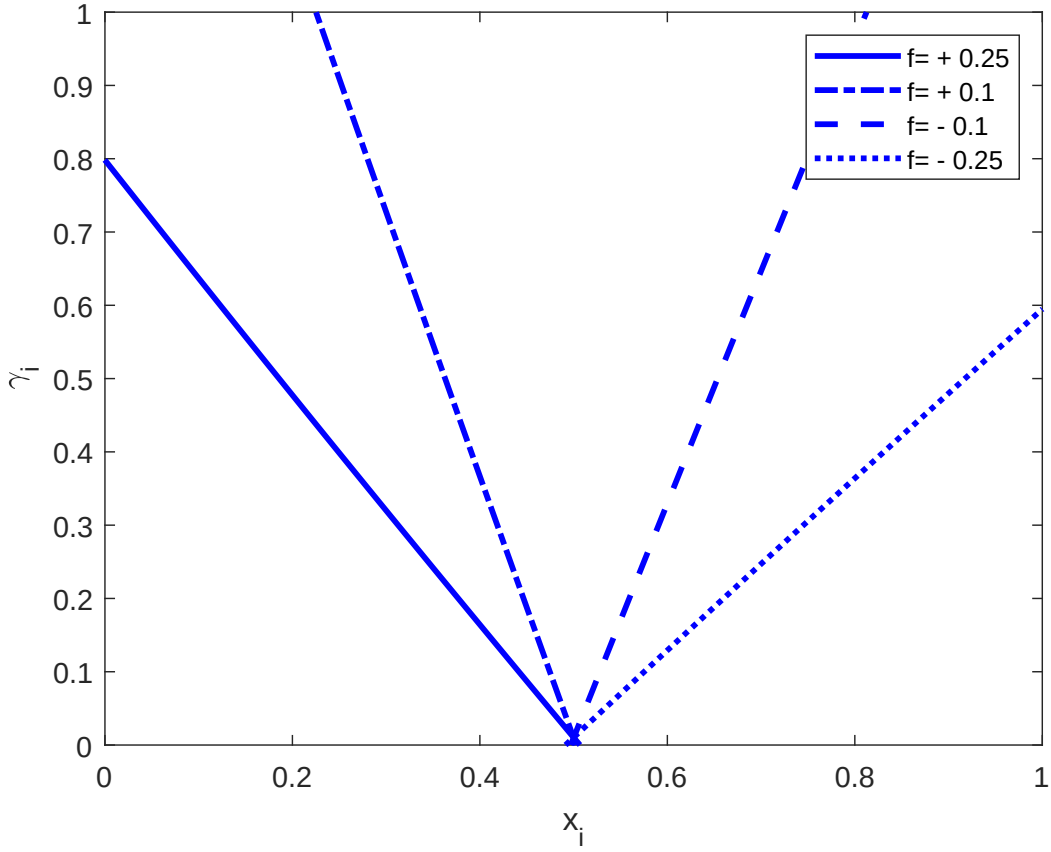
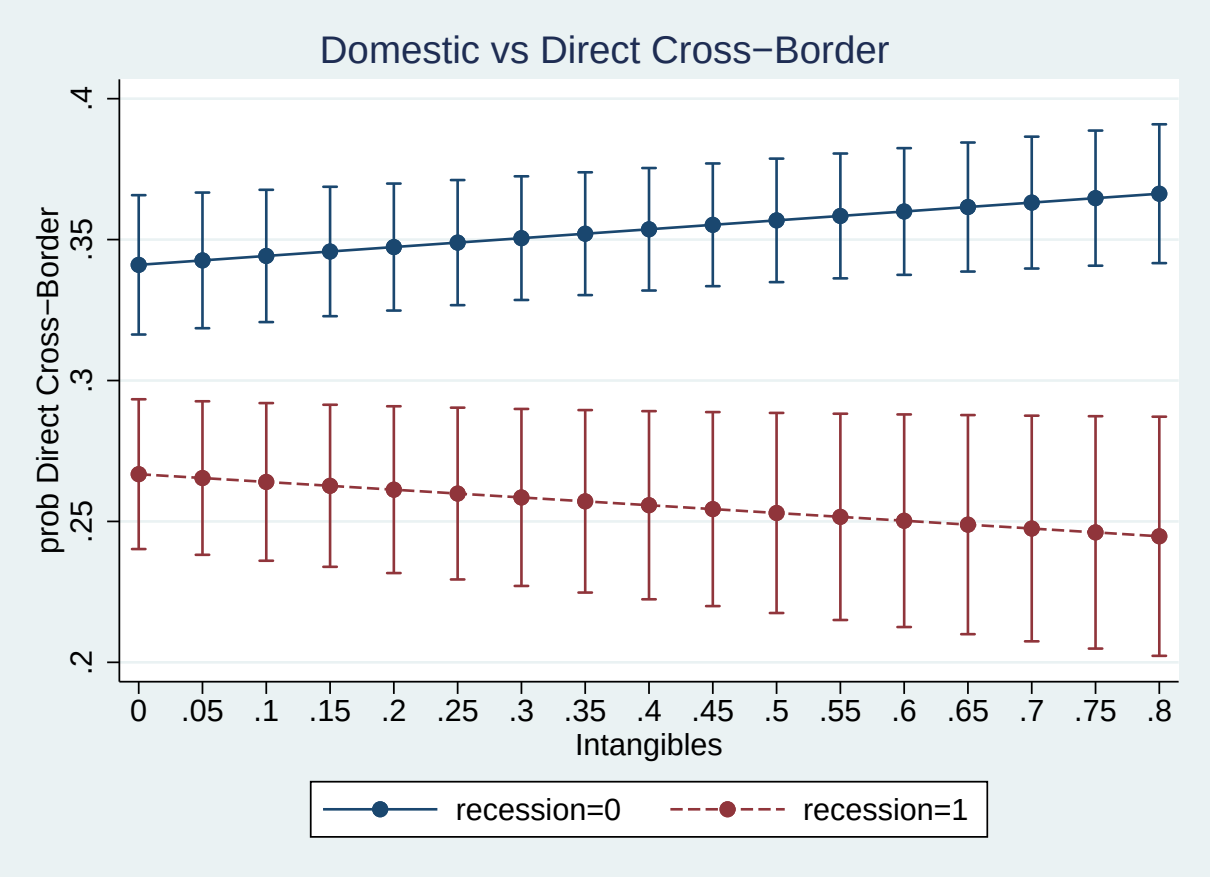
Figure 1: Border between groups of borrowers



The figure depicts the border between borrowers borrowing from the domestic and the foreign lenders, respectively, in the (x_i, γ_i)-plane when $f = +0.25$, $f = +0.1$, $f = -0.1$ and $f = -0.25$, respectively, holding ϑ constant at its expected value ($\vartheta = E[\vartheta] = 0$). Other parameter values are $\beta_i = 0.5$, $\rho = 0.3$, $\sigma_\vartheta = 0.3$, $\sigma_f = 0.3$, $\sigma_{\epsilon_i} = 0.2$, $t = 0.05$, and $\delta = 1$.

Figure 2: Probability of taking a direct cross-border loan



The figure depicts the probability of getting a foreign loan calculated from specification 4 in Table 2 for different levels of intangibles during recessions and normal times, all other variables are set to their average values. The vertical bars are 95% confidence intervals calculated using the delta method.

Table 1: Firm and loan characteristics

VARIABLES	Mean		Median		Stdev		1st Percentile		99th Percentile	
	All fac.	Available	All fac.	Available	All fac.	Available	All fac.	Available	All fac.	Available
Total assets (constant USD mn)	12,280	13,765	1,966	2,362	31,617	33,561	45.6	51.9	175,113	186,282
Total assets growth	0.076	0.073	0.044	0.043	0.24	0.24	-0.43	-0.44	1.07	1.06
Share of intangible assets	0.36	0.37	0.40	0.40	0.41	0.41	0.00	0.00	0.98	0.98
Return on assets	0.041	0.044	0.037	0.039	0.047	0.047	-0.078	-0.072	0.18	0.18
Leverage	0.30	0.29	0.29	0.28	0.18	0.18	0	0	0.78	0.78
Market leverage (listed firms)	0.26	0.24	0.23	0.22	0.17	0.16	0	0	0.70	0.67
Market-to-book ratio (listed firms)	2.30	2.41	1.40	1.45	5.60	5.83	0.19	0.19	14.3	15.9
Share of foreign sales	0.37	0.36	0.32	0.30	0.33	0.33	0	0	0.99	0.99
R&D expense/revenue	0.0097	0.0083	0	0	0.030	0.028	0	0	0.15	0.15
High-tech firm (dummy)	0.17	0.15	0	0	0.38	0.36	0	0	1	1
Listed firm (dummy)	0.93	0.93	1	1	0.25	0.26	0	0	1	1
Loan amount (constant USD mn)	416	459	122	143	1,084	1,147	3.80	4.19	4,301	4,497
Maturity (months)	50.2	49.2	49	48	35.4	36.1	6	6	180	180
No. of lenders	6.80	6.53	5	4	5.97	6.09	1	1	30	31
Syndicated (dummy)	0.95	0.95	1	1	0.21	0.22	0	0	1	1
Spread (bp)	174	203	130	175	144	158	15	15	725	800
No. of covenants	0.27	0.094	0	0	0.78	0.46	0	0	3	3
No. of perf. pricing provisions	0.14	0.15	0	0	0.88	0.91	0	0	5	5
Collateralized (dummy)	0.21	0.17	0	0	0.41	0.38	0	0	1	1
Loan in borrower's home currency (dummy)	0.72	0.71	1	1	0.45	0.46	0	0	1	1
Borrower country recession (dummy)		0.39		0		0.49		0		1
Number of observations	14 523	12 655								

This table reports descriptive statistics for firm- and loan-level variables for the estimation sample. Variable definitions are found in Table 12 of Forssbæck, Lundtofte, Strieborny, and Vilhelmsson (2018). The all fac. sample is defined on the basis of availability of independent variables includes only observations for which the following borrower-firm and loan-level variables are simultaneously non-missing: Total assets, Share of intangible assets, Return on assets, Total assets growth, Leverage, Share of foreign sales, R&D expense/revenue, High-tech firm, Listed firm, Loan type, Loan purpose, and Loan origination date. Additionally, the home country of the lender bank (but not necessarily of its immediate parent or ultimate owner) must be identified. The sample called available is restricted to the 40 OECD countries for which we have recession information. For specifications that contain the exact independent variables defining the "available", the effective sample size is smaller than the number of obs. in this table would suggest, since the dependent variable places additional restrictions on data availability, because it requires that the lender's immediate parent and/or ultimate owner is identified.

Table 2: Main results

VARIABLES	All firms				Listed firms			
	All foreign loans		Direct CB loans		All CB loans		Direct CB loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Borrower country recession (dummy)	-0.16***	-0.082***	-0.15***	-0.074***	-0.16***	-0.080***	-0.15***	-0.070**
	(0.037)	(0.025)	(0.035)	(0.024)	(0.046)	(0.027)	(0.044)	(0.026)
Recession*Share of intangible assets	-0.063**	-0.062***	-0.065***	-0.059***	-0.053*	-0.061***	-0.054**	-0.056***
	(0.025)	(0.017)	(0.024)	(0.019)	(0.027)	(0.017)	(0.025)	(0.019)
Share of intangible assets	0.012	0.034**	0.012	0.032**	0.015	0.044***	0.015	0.042***
	(0.024)	(0.015)	(0.025)	(0.014)	(0.025)	(0.015)	(0.027)	(0.015)
Share of foreign sales	0.24***	0.078***	0.22***	0.071***	0.24***	0.072***	0.22***	0.070***
	(0.043)	(0.020)	(0.045)	(0.019)	(0.043)	(0.023)	(0.044)	(0.021)
R&D expense/revenue	0.39	0.59***	0.36	0.44***	0.55**	0.66***	0.50*	0.48***
	(0.27)	(0.20)	(0.27)	(0.14)	(0.26)	(0.19)	(0.25)	(0.13)
Return on assets	0.12	-0.16	0.19	-0.14*	0.058	-0.17	0.049	-0.18**
	(0.21)	(0.11)	(0.19)	(0.075)	(0.20)	(0.10)	(0.19)	(0.070)
Leverage or market leverage	-0.0074	-0.020	-0.013	-0.024	-0.077	-0.031	-0.076	-0.032
	(0.068)	(0.029)	(0.077)	(0.025)	(0.091)	(0.026)	(0.094)	(0.021)
Total assets (constant USD mn, log)	0.014	0.019***	0.017*	0.020***	0.018**	0.022***	0.020**	0.022**
	(0.0087)	(0.0059)	(0.0088)	(0.0069)	(0.0088)	(0.0075)	(0.0093)	(0.0084)
High-tech firm (dummy)	0.0087	-0.010	0.0093	-0.0089	-0.012	-0.0059	-0.0073	-0.0055
	(0.018)	(0.019)	(0.017)	(0.018)	(0.020)	(0.023)	(0.017)	(0.021)
Listed firm (dummy)	-0.070	-0.027	-0.063	-0.027				
	(0.042)	(0.016)	(0.039)	(0.016)				
Borrower country GDP/capita	-0.19***	-0.24	-0.19***	-0.23	-0.19***	-0.20	-0.19***	-0.20
	(0.036)	(0.17)	(0.034)	(0.18)	(0.034)	(0.17)	(0.032)	(0.19)
Total assets growth	0.047	0.020	0.027	0.0059	0.059	0.019	0.037	0.0033
	(0.046)	(0.019)	(0.037)	(0.015)	(0.050)	(0.020)	(0.039)	(0.017)
Market-to-book ratio (listed firms)					0.00085	0.00097	0.00054	0.00054
					(0.00091)	(0.00070)	(0.00084)	(0.00076)
Constant	3.24***	2.91	3.14***	2.80	2.26***	2.01	2.17***	2.02
	(0.44)	(1.78)	(0.45)	(1.93)	(0.43)	(1.83)	(0.43)	(1.98)
Reduced / Full fixed effects	Reduced	Full	Reduced	Full	Reduced	Full	Reduced	Full
Observations	12,655	12,655	12,312	12,312	10,998	10,998	10,728	10,728
R-squared	0.310	0.628	0.306	0.640	0.312	0.625	0.309	0.640

This table reports the results of OLS regressions of key borrower-firm characteristics and controls. For all foreign loans the dependent variable takes the value of one if the lender, the lenders immediate parent or global ultimate owner is domiciled in a different country than the borrower. For direct CB loans the dependent variable takes the value one if the lender is domiciled in a different country than the borrower. The sample is restricted to loans originated between 1999 and 2016. All specifications include fixed effects for 1-digit SIC industry, Year, Loan type, Loan purpose, and Borrower region. We use two different sets of fixed effects, reduced fixed effects which include 1-digit SIC industry, Year, Loan type, Loan purpose and Borrower region. The borrower region fixed effects are dummy variables for each of the World Bank's geographical regions based on the borrower firm's home country.The regions are Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, North America, South Asia and Sub-Saharan Africa. Full fixed effects use all the reduced fixed effects plus 2-digit SIC Industry codes and lender and borrower country fixed effects instead of regions. Standard errors are clustered at borrower country level. */**/*** indicates statistical significance at the 10/5/1 percent level.

Table 3: Different opacity proxies

VARIABLES	All firms				Listed firms			
	All foreign loans		Direct CB loans		All foreign loans		Direct CB loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Borrower country recession (dummy)	-0.087***	-0.087***	-0.078***	-0.080***	-0.082***	-0.083***	-0.072**	-0.074**
	(0.028)	(0.028)	(0.028)	(0.029)	(0.029)	(0.030)	(0.029)	(0.030)
Recession*High-tech firm	-0.033**		-0.030*		-0.041**		-0.035**	
	(0.016)		(0.016)		(0.018)		(0.017)	
Recession*R&D expense/revenue		-0.48***		-0.32***		-0.50**		-0.35**
		(0.14)		(0.11)		(0.19)		(0.14)
High-tech firm (dummy)	0.0056	-0.0096	0.0063	-0.0074	0.016	-0.0030	0.014	-0.0019
	(0.018)	(0.017)	(0.020)	(0.016)	(0.021)	(0.019)	(0.021)	(0.017)
R&D expense/revenue	0.53**	0.74***	0.41**	0.56***	0.54**	0.74***	0.39**	0.54***
	(0.21)	(0.23)	(0.16)	(0.16)	(0.22)	(0.23)	(0.15)	(0.14)
Share of foreign sales	0.072***	0.072***	0.064***	0.064***	0.064***	0.064***	0.062***	0.062***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.021)	(0.020)	(0.020)
Return on assets	-0.19*	-0.19*	-0.17**	-0.17**	-0.18*	-0.18*	-0.19**	-0.18**
	(0.10)	(0.10)	(0.076)	(0.077)	(0.10)	(0.10)	(0.069)	(0.069)
Leverage or market leverage	-0.0049	-0.0043	-0.0062	-0.0057	-0.033	-0.033	-0.034*	-0.034*
	(0.024)	(0.023)	(0.020)	(0.020)	(0.022)	(0.022)	(0.018)	(0.018)
Total assets (constant USD mn, log)	0.017***	0.018***	0.018**	0.018**	0.020**	0.021**	0.020**	0.020**
	(0.0058)	(0.0058)	(0.0067)	(0.0067)	(0.0077)	(0.0078)	(0.0086)	(0.0086)
Listed firm (dummy)	-0.024	-0.024	-0.025	-0.025				
	(0.016)	(0.016)	(0.016)	(0.016)				
Borrower country GDP/capita	-0.23	-0.23	-0.22	-0.23	-0.19	-0.19	-0.19	-0.19
	(0.17)	(0.17)	(0.18)	(0.18)	(0.17)	(0.17)	(0.19)	(0.19)
Total assets growth	0.025	0.025	0.010	0.011	0.025	0.025	0.0088	0.0093
	(0.020)	(0.020)	(0.016)	(0.016)	(0.021)	(0.021)	(0.018)	(0.018)
Market-to-book ratio (listed firms)					0.00065	0.00065	0.00030	0.00031
					(0.00074)	(0.00075)	(0.00083)	(0.00083)
Constant	2.88	2.89	2.73	2.74	1.96	1.97	1.94	1.95
	(1.81)	(1.81)	(1.96)	(1.96)	(1.83)	(1.83)	(2.00)	(2.00)
Observations	15,108	15,108	14,731	14,731	13,175	13,175	12,889	12,889
R-squared	0.641	0.641	0.653	0.653	0.637	0.637	0.652	0.652

This table reports the results of OLS regressions of key borrower-firm characteristics and controls. The dependent variable takes the value of one if the lender, the lenders immediate parent or global ultimate owner is domiciled in a different country than the borrower. All definitions are as in Table 2. */**/*** indicates statistical significance at the 10/5/1 percent level.

Table 4: Large distance loans

VARIABLES	All (1)	Geo dist (2)	Diff language (3)	Non-contiguous (4)	Non-colonial (5)	Any (6)
Borrower country recession	-0.082***	-0.030**	-0.066***	-0.071***	-0.080***	-0.019**
	(0.025)	(0.013)	(0.021)	(0.021)	(0.025)	(0.0091)
Recession*Share of intangible assets	-0.062***	-0.024*	-0.059***	-0.059***	-0.067***	-0.014
	(0.017)	(0.012)	(0.022)	(0.015)	(0.017)	(0.0092)
Share of intangible assets	0.034**	0.031**	0.038**	0.043***	0.034**	0.023**
	(0.015)	(0.012)	(0.016)	(0.015)	(0.015)	(0.010)
Share of foreign sales	0.078***	0.060***	0.076***	0.096***	0.074***	0.040***
	(0.020)	(0.014)	(0.022)	(0.020)	(0.019)	(0.013)
R&D expense/revenue	0.59***	0.11	0.66***	0.40**	0.59***	0.20*
	(0.20)	(0.11)	(0.21)	(0.19)	(0.20)	(0.097)
Return on assets	-0.16	-0.18**	-0.13*	-0.18	-0.16	-0.14*
	(0.11)	(0.081)	(0.072)	(0.11)	(0.10)	(0.075)
Leverage	-0.020	-0.062***	0.0077	-0.037*	-0.022	-0.036**
	(0.029)	(0.017)	(0.031)	(0.021)	(0.029)	(0.017)
Total assets (constant USD mn, log)	0.019***	0.0099***	0.020***	0.017***	0.019***	0.0082***
	(0.0059)	(0.0028)	(0.0071)	(0.0051)	(0.0060)	(0.0016)
High-tech firm	-0.010	0.00046	-0.019	-0.012	-0.0084	-0.0086
	(0.019)	(0.011)	(0.021)	(0.016)	(0.019)	(0.0075)
Listed firm (dummy)	-0.027	0.015	-0.019	-0.021	-0.026	0.027**
	(0.016)	(0.013)	(0.015)	(0.017)	(0.016)	(0.011)
Borrower country GDP/capita	-0.24	-0.087	-0.23	-0.18	-0.23	-0.085
	(0.17)	(0.17)	(0.15)	(0.15)	(0.17)	(0.15)
Total assets growth	0.020	0.0027	0.0083	0.018	0.020	0.0024
	(0.019)	(0.012)	(0.015)	(0.019)	(0.019)	(0.011)
Constant	2.91	1.76	2.77	2.58	2.85	1.67
	(1.78)	(1.87)	(1.74)	(1.62)	(1.79)	(1.73)
Full fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,655	10,330	11,256	11,834	12,550	9,712
R-squared	0.628	0.701	0.609	0.621	0.631	0.718

This table reports the results of OLS regressions of key borrower-firm characteristics and controls. The dependent variable takes the value of one if the lender, the lenders immediate parent or global ultimate owner is domiciled in a different country than the borrower. All definitions are as in Table 2. Geo distance excludes loans from borrower/lender country pairs who has a geographical distance smaller then the median distance for cross-border loans, Diff language excludes cross-border loans from borrower/lender pairs who share a common language, non-contiguous exclude loans from borrower/lender pairs that are contiguous (share a border), non-colonial exclude loans from borrower/lender pairs that have had a colonial relationship from 1945 or more recently, finally the column Any excludes all loans that were excluded in any of specifications 2-5. */**/*** indicates statistical significance at the 10/5/1 percent level.