



Financial liberalization and access to credit in emerging and developing economies: A firm-level empirical investigation

Sasidaran Gopalan^a, Subash Sasidharan^{b,*}

^a Nanyang Business School, Nanyang Technological University, Singapore

^b Department of Humanities and Social Sciences, Indian Institute of Technology, Madras, India

ARTICLE INFO

JEL classification:

F21
F23
G21
L11

Keywords:

Foreign bank presence
Credit constraints
Information asymmetry
Financial inclusion

ABSTRACT

Several emerging market and developing economies (EMDEs) embracing financial liberalization have seen a growing presence of foreign banks in their countries over the last two decades. While foreign banks can contribute to reduced costs of financial intermediation which could result in increased credit availability, there is greater ambiguity about the relationship between foreign bank presence and firms' access to credit. In this paper, we combine both disaggregate firm-level data from the World Bank Enterprise Survey (WBES) as well as country-data to construct a novel and comprehensive measure capturing firms' credit constraints as well as information verifiability for firms. Using a firm-level sample of 37,578 observations representing 60 EMDEs covering the time period 2006 to 2014, we employ an ordered probit model on cross-sectional data to understand empirically how foreign banks affect firms' access to credit. Our results show evidence for foreign bank presence tending to ease firms' credit constraints. We also find that firms with audited financial statements tend to experience a reduction in credit constraints. Finally, our results point out that for micro, small and medium firms, in relation to the large firms, greater information availability through audited financial statements jointly associated with greater foreign bank presence tends to ease firm credit constraints.

1. Introduction and motivation

Several emerging market and developing economies (EMDEs) have allowed varying degrees of financial sector liberalization that has, among other things, included a notable increase in the presence of foreign banks in their economies. This has resulted in a growing strand of empirical literature attempting to understand the various consequences of foreign bank presence in EMDEs, both using aggregate and firm-level data (See for instance the discussions in Cull & Peria, 2007; Claessens & Van Horen, 2013; World Bank, 2018 for an overview of this literature). One of the oft-noted concerns about the influence of financial liberalization in the form of greater foreign bank presence in EMDEs pertain to their impact on financial inclusion, which can be broadly defined as greater access to financial services for a large segment of the population (See Gopalan & Rajan, 2018 for a discussion).

A key insight emanating from the related literature on foreign banks is they are capable of contributing to reduced costs of financial intermediation in the host economy which in turn could result in increased overall credit availability. However, there is greater ambiguity about the relationship between foreign bank presence and firms' access to credit in EMDEs (Bruno & Hauswald, 2013). The source of this disagreement stems from the existence of information asymmetry in the lender-borrower relationship that could lead to high costs of investing in lending relationships, particularly with small and opaque firms, which may result in a

* Corresponding author.

E-mail addresses: sasi.gopalan@ntu.edu.sg (S. Gopalan), subash@iitm.ac.in (S. Sasidharan).

<https://doi.org/10.1016/j.jeconbus.2019.105861>

Received 10 April 2019; Received in revised form 9 August 2019; Accepted 12 August 2019

Available online 20 August 2019

0148-6195/ © 2019 Elsevier Inc. All rights reserved.

reduction in the credit access for them.

We could also view the relationship between foreign bank presence and access to credit from the lens of the broader literature linking banking competition and credit access for firms. There are two relevant yet competing narratives that stem from this literature (Leon, 2015). If one goes by the “*market power hypothesis*”, then we can argue that greater competition in the banking system typically tends to reduce financing costs for firms which in turn results in higher credit availability. However, the “*information hypotheses*” argues that given that the lender-borrower relationship is heavily characterized by information asymmetries, intensified banking competition can limit the incentives for banks to invest in lending relationships (Petersen & Rajan, 1995), which may affect firms that are particularly informationally opaque and rely more on relationship banking.¹

A related strand of studies specific to foreign banks arising from the information asymmetry framework pertains to the so-called “cherry-picking” behavior of foreign banks upon their entry into host economies. As the literature points out, when foreign banks enter the economy, they may be in a position to choose clients of the highest quality given their ability to monitor only hard information firms which leaves behind the riskier pool of borrowers for the domestic banks. Eventually this process may likely result in a net welfare loss if the domestic banks are forced to either exit the market unable to deal with the riskier pool of opaque borrowers (most often the small and medium-sized enterprises (SMEs)) or reduce their lending to that pool of risky borrowers (Gormley, 2010).

Given this background, in this paper, we are specifically interested in empirically understanding the relationship between foreign bank presence in EMDEs and firms’ credit constraints. More specifically, we would like to empirically investigate the following research question: To what extent is information verifiability of firms’ creditworthiness a crucial determinant of their credit constraints and what is the exact nature of this relationship in EMDEs with greater foreign bank presence? To examine this, we assemble both disaggregate firm-level data sourced from the World Bank Enterprise Survey (WBES) as well as country-data for 60 EMDEs spanning the time period 2006 to 2014. We then construct a novel and comprehensive measure capturing firms’ credit constraints along with a measure of information verifiability for firms of varying size based on WBES data. Using these measures, we contribute to the related literature by empirically investigating the impact of financial liberalization in the form of foreign bank presence in EMDEs on firms’ access to credit.

The remainder of our paper is organized as follows. We begin by reviewing the relevant theoretical and empirical literature on foreign banks and cherry-picking behavior in Section 2. Following this, we furnish details about data, our empirical model and identification strategies in Section 3. Our empirical results along with robustness checks are discussed in Section 4. We conclude by summarizing our empirical findings and noting some policy takeaways in Section 5.

2. Review of selected literature²

There is an established theoretical literature outlining the mechanisms through which foreign banks engage in “cherry-picking” behavior, where they end up choosing clients of the highest quality (due to the information advantage foreign banks possess in screening different classes of borrowers). This process results in leaving behind the riskier pool of borrowers for the domestic banks and eventually could force the domestic banks to increase their lending rates lowering the overall supply of credit in the economy. This could also result in a potential net welfare loss for the economy if foreign banks crowd out domestic banks, (See Detragiache, Tressel, & Gupta, 2008 and Gormley, 2010 for a discussion).

One of the key implications of this line of reasoning is that smaller yet credit-worthy borrowers such as the SMEs who are typically characterized by information opacity could be adversely affected owing to their dependence on domestic banks. Building on the framework of information asymmetry and the role it plays in allocation of credit,³ several papers including Sengupta (2007) and Detragiache et al. (2008) develop theoretical models to capture the welfare effects of domestic and foreign banks with differing screening abilities on the different classes of borrowers (firms of different sizes with different degrees of credit worthiness).⁴ All these models appear to suggest that foreign banks possess a greater comparative advantage both in terms of costs and information and cherry-pick low-risk borrowers away from domestic banks.⁵

In contrast to the above models, Dell’Ariccia and Marquez (2001) show theoretically that foreign bank entry actually increases the loans available to borrowers with soft-information characteristics (SMEs for instance). The reasoning in the paper is that since foreign

¹ More generally, information about the firms that are easily quantifiable (like financial statements of firms) qualify as hard information while information that is difficult to quantify qualifies as soft information. There is some literature that suggests that small firms tend to be opaque and the lending process involves some form of a relationship to gather soft information about them which forms the basis for lending. For more discussion on soft versus hard information, see Petersen (2004). For an overview of the literature on relationship lending and banking competition, see Boot (2000).

² For a comprehensive overview of both the theoretical and empirical literature on foreign banks and firms’ access to credit, see Rajan and Gopalan (2015).

³ The standard credit market model with adverse selection is typically attributed to the seminal work of Stiglitz and Weiss (1981).

⁴ A tangential strand of literature points out greater geographical distance between the loan officers and management creates difficulties in lending to informationally opaque firms (Berger, Miller, Petersen, Rajan, & Stein, 2005). This is more so in the case of foreign banks in EMDEs, where the “geographic and cultural distance” between the headquarters and the locally established subsidiaries is likely to be large. Also see Sapienza (2002), and Degryse and Ongena (2005) for a discussion.

⁵ Alternatively, there is loss of market share by the incumbent so that they are willing to lower credit quality and start financing everyone. That is why financial liberalization sometimes leads to a surge in domestic credit and rising non-performing loans (NPLs) as banks chase new customers (See Bird & Rajan, 2002 for a discussion).

banks focus on larger and less informationally opaque clients, domestic banks concentrate more on lending to soft-information borrowers such as SMEs that in turn translates into greater availability of credit.

It is pertinent to note here the mode of foreign bank entry could also play a role in whether or not foreign banks engage in cherry-picking behavior. A *de novo* foreign bank could have potentially greater cherry-picking implications than when the foreign bank enters through mergers and acquisitions (For a related theoretical discussion, see Van Tassel & Vishwasrao, 2007; Claeyns & Hainz, 2006).

In an important contribution to this strand of literature, Berger and Udell (2006) argue that the typology of hard and soft information is oversimplified and that there is a need to distinguish between different types of hard information before assessing the effects of information constraints on SME financing. In particular, they posit that foreign banks could overcome their information disadvantage with alternative transactional lending technologies.

In contrast to the theoretical literature, there is a relatively limited but growing empirical literature exploring the implications of foreign banks on credit creation and its varied impacts on different classes of borrowers. Papers such as Kim and Lee (2004) for Korea, Gormley (2010) for India and Mian (2006) for Pakistan are some representative examples of country studies that find broad empirical support to the cherry-picking hypothesis of foreign banks.⁶ Focusing on firms in Latin American countries, Clarke, Cull, and Peria (2006) test whether the origin of banks play a role in determining the share and of bank lending to SMEs and finds that in general foreign banks lent a smaller fraction of their funds to SMEs than similar domestic banks. In yet another firm-level analysis of lending patterns of foreign banks in Eastern European countries, Giannetti and Ongena (2005) find that the effects of foreign banks are generally more significant for large firms and firms that are less likely to be involved in “connected lending”, while they are ‘dampened’ for SMEs.

In contrast to the above set of papers, there are a few empirical papers that have found that SMEs have benefitted from foreign bank presence. Clarke et al. (2006) for instance, using perceptions-based measures of credit constraints, find that SMEs are less credit-constrained in countries with greater foreign bank participation across a panel of EMDEs. Similar evidence on Central Europe and Baltic States based on interviews with foreign banks can be found in the results of De Haas and Naaborg (2005). Using extensive survey insights from banks across countries, Beck (2007) show that the share of SME loans is actually higher among foreign banks than domestic banks. Similar results can be seen in De la Torre, Martinez Peria, and Schmukler, 2010 who observe that foreign bank lending to SMEs occur through alternative lending technologies that go beyond just traditional relationship lending, effectively dismissing concerns of cherry-picking behavior.

In a more recent paper, focusing on Bolivian credit registries, Beck, Ioannidou, and Schäfer (2017) show that foreign banks rely on contract design (effective collateral protection) and credit scoring models for their lending practices, implying that foreign banks will find it difficult to lend to SMEs in countries where the requisite information environment is absent and difficulties in enforcing collateral rights persist.

As the above discussion points out, the empirical evidence uncovering the relationship between foreign bank presence in EMDEs, firms’ credit constraints and the information environment is quite mixed, leaving an important gap to be filled in the related literature. Thus in this paper, we are interested in understanding the extent to which information verifiability of firms creditworthiness proves to be a crucial determinant of their credit constraints, especially in EMDEs with greater foreign bank presence. The only paper in the literature that comes closest in spirit to our analysis is Clarke et al. (2006). However, we differ from their analysis in many important ways, the most significant being that we measure firms credit constraints more comprehensively from the World Bank Enterprise Surveys (WBES), consistent with the framework proposed by Kuntchev, Ramalho, Rodríguez-Meza, and Yang (2012) summarized in Fig. 1 and elaborated in the next section.

3. Data and empirical model

Our estimation strategy relies on combining firm level information from the World Bank Enterprise Survey (WBES) and matching it with country-level information that we have on foreign bank presence. The Enterprise Surveys cover over 130,000 firms in 125 countries, of which 113 have been surveyed. Of the 113 countries surveyed, 38 are in Sub-Saharan Africa, 30 are in Eastern Europe and Central Asia, 31 are in Latin America and the Caribbean, 10 are in East Asia and Pacific, 3 are in South Asia, and one in the Middle East and North Africa.⁷

Our sample period runs from 2006 to 2014. Even though surveys were conducted for earlier years, we consider data from the year 2006 due to the considerable differences in the questionnaire format and sampling methodology across countries in the previous rounds. Further, questions have been raised about the representativeness of the enterprise surveys conducted in earlier years. Due to the irregular nature of the surveys and the huge variation in the number of firms surveyed within a country, it is difficult to construct a panel of firms. Therefore, we combine the data into repeated cross-sections, which leaves us with a sample of 37,578 firms. The sample of countries, years, and firms included in the empirical analysis is provided in Appendix Table A1. We also supplement the WBES data with a number of country-level sources obtained from the World Bank’s World Development Indicators, Global Financial Development Database and World Bank Governance Indicators, the details of which can also be found in Appendix Table A1.

⁶ Focusing on Belgium, De Maeseineire and Claeyns (2012) offer exploratory empirical support to the view that SMEs that aim to internationalize suffer from severe credit constraints largely owing to information problems.

⁷ Details of these surveys can be obtained from: <http://www.enterprisesurveys.org>. For a recent application of the WBES to investigate the relationship between financial development and innovation, see Aristizabal-Ramirez, Botero-Franco, and Canavire-Bacarreza, (2017).

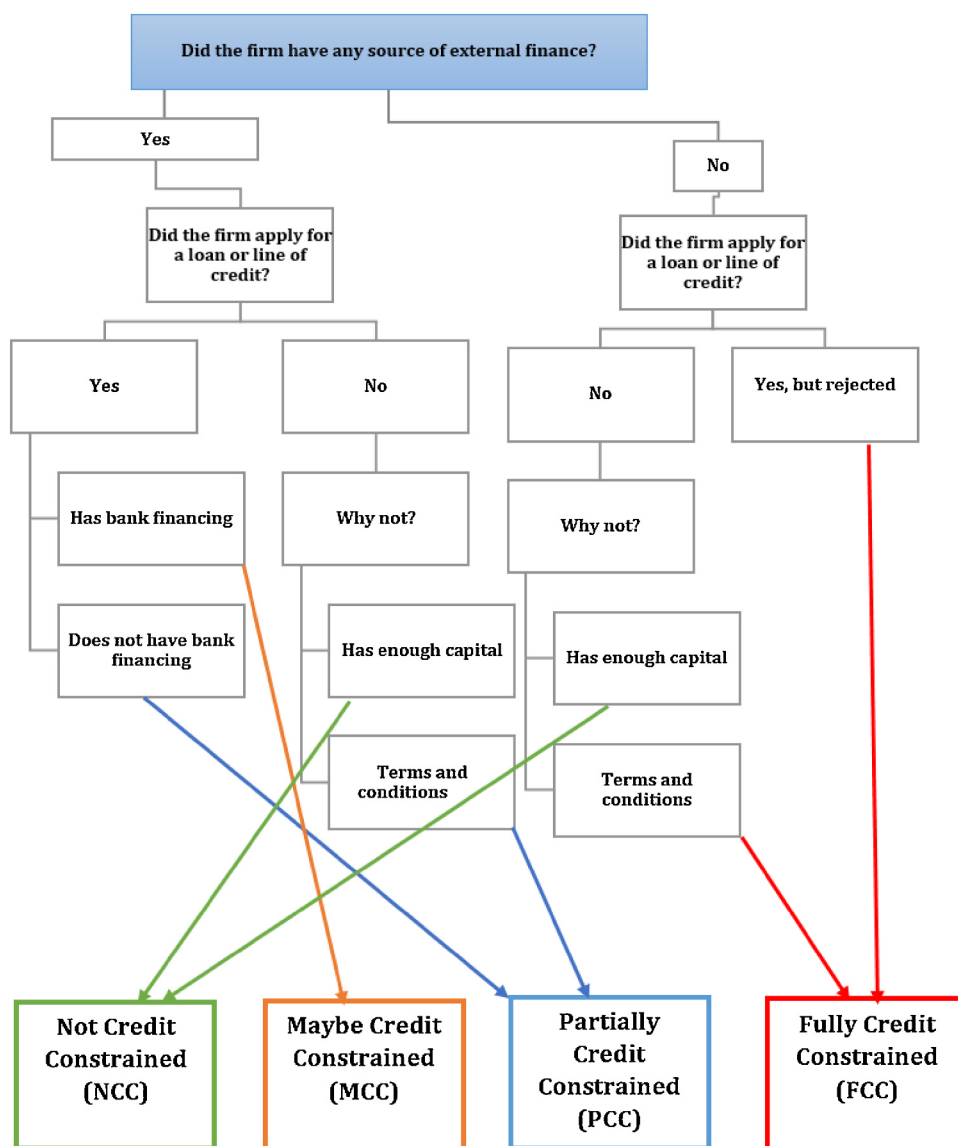


Fig. 1. Constructing Firms' Credit Constraints. Source: Adapted from Kuntchev et al. (2012, p.20). Fig. 1: Correspondence between credit-constrained groups and the questions in Enterprise Surveys

Table 1 provides a snapshot of the firm-level data availability from WBES. The WBES data set contains a full sample of 81,948 observations for our study period. Similar to many other firm-level databases, the WBES database also features several missing values of the key variables of interest to our paper. The way of dealing with those before using them in our empirics, we remove the missing values for the variable on financial constraints that we intend to construct from WBES data. This leaves us with about 68,172 observations in our dataset. As the next step, we remove the missing firm observations for foreign banks share and the financial

Table 1
Data Availability from World Bank Enterprise Survey.
Source: Authors.

Total Data in WBES from 2006 to 2014	81948	81948
Missing data on financial constraints (cc)	Less -13776	68172
Missing data on Foreign Banks Assets (fbata)	Less - 4654	63518
Missing data on financial auditing (finaud)	Less - 795	62723
Missing data on all control variables	Less - 25,145	37,578

statements audited, which leaves us with 62,723 firms. Finally, after filtering out all the missing firm observations for the control variables, the final sample we use for our estimation consists of 37,578 observations representing firm-level information gleaned from 60 EMDEs.

The idea of our empirical model is to specifically examine how greater foreign bank presence in EMDEs affects the relationship between firms' credit constraints and greater information availability about their creditworthiness. For this purpose, we make use of disaggregated firm-level surveys to construct measures of credit constraints as well as information verifiability of firms of varying sizes in order to examine whether the relationship between foreign banks and firms' credit constraints are influenced by the extant information environment.

To do so, we employ a standard ordered probit model on cross-sectional data described above. We estimate different variants of the following equation on our constructed measure of credit constraints:

$$CC_{ijt} = \beta_0 + \beta_1 Size_{ijt} + \beta_2 FBTA_{jt} + \beta_3 FinAud_{ijt} + \beta_4 FBTA_{jt} FinAud_{ijt} + \beta_5 Z_{ijt} + \beta_6 X_{jt} + \varepsilon_{ij}$$

One of the important value-additions of our paper is to construct a comprehensive measure of firms' credit constraints from the WBES. The empirical strategy as outlined in Kuntchev et al. (2012) is by far the most comprehensive way in the related literature to measure credit constraints. To be sure, this is not a readily available measure and thus has to be constructed using firm level data. To our knowledge, we are not aware of applications of this measure in the empirical literature on foreign bank presence and credit constraints of firms. A graphical illustration of the survey questions that were used to construct the dependent variable can be seen in Fig. 1.

The dependent variable (CC_{ijt}) proxying for credit constraints is thus an ordinal variable ranging from 1 to 4, with higher ranking indicating greater credit constraints. We create four groups of firms that are fully credit constrained (4), partially credit constrained (3), maybe credit constrained (2) and not credit constrained (1). We thus generate an ordinal variable that reflect increasing order of credit constraints. Each group includes the firms that meet a set of conditions outlined in Fig. 1. The fully credit constrained firms have no external loans because their loan applications were rejected or the firm did not even bother to apply even though they needed additional capital. The two intermediate categories Partially Credit Constrained (PCC) and Maybe Credit Constrained (MCC) factor in the various possibilities of why firms may self-select out of the credit market due to prevailing terms and conditions and yet may or may not find alternative sources of financing. Finally, the Non-Credit Constrained (NCC) group includes the firms, independent of its current level of external finance, are happy with their current financing structure (Kuntchev et al., 2012, p. 9–11).

We construct a measure of information verifiability $FinAud_{ijt}$ as a dummy variable representing the availability of audited financial documents for firms. The WBES survey asks (question K21) if "in the respective fiscal year, the establishment have its annual financial statement checked and certified by an external auditor." Considering that the basic premise of the cherry-picking literature lies in the distinction between hard and soft information, we create a dummy variable from this survey question that will take a value of one if the financial statements are audited and 0 otherwise.⁸ This will enable us to test the relationship between availability of hard information for that particular firm and its credit constrained status.⁹

The variable capturing foreign bank presence $FBTA_{jt}$ comes from the Global Financial Development Database (GFDD), which is defined as the percentage share of the total banking assets that are owned by foreign banks. The other alternative is to use the percentage of number of foreign banks to the total number of banks in an economy although the related literature notes that the share of assets is a more meaningful measure capturing foreign bank presence in an economy at a particular point in time.

The relevant literature pertaining to firms' credit constraints and foreign bank presence appears to suggest a host of control variables, capturing both firm-specific characteristics as well as country peculiarities, to be used in the empirical estimation. In all our specifications, we control for a variety of firm specific and country control variables, as listed and briefly discussed below.

- **Firm Size:** The size of firms is a commonly used measure of access to external finance. Small firms are expected to gain little from the presence of the foreign banks since the latter may find it difficult to obtain such 'soft' information which may affect the lending decision to such firms (Berger & Udell, 2002). Firms are categorized as *small* if they employ less than 20 employees, a firm is treated as *medium* if it employs between 20 and 100 employees, and *large* if they have more than 100 employees.
- **Age:** We also control for firm age, defined as the logarithm of the number of years since the firm began its operations.
- **Firm Ownership:** We control for the foreign ownership by including a dummy variable which is equal to one when equity is owned by private foreign individuals, companies or organizations. Similarly, we include a dummy variable equal to one when the firm is owned by the State/government.
- **Exporting Firms:** Our specifications also include a dummy variable set to one when the firm exports part of its output either directly or indirectly. It is well recognized that exporters enjoy lower credit constraints and find it relatively easy to obtain credit.
- **Quality Certification:** Firms with quality certification are less likely to experience financing constraints since it indicates its quality.

⁸ Kano, Uchida, Udell, and Watanabe, (2011) employ a similar strategy of creating a hard information variable from a survey question relating to audited financial statements using Japanese survey data to investigate the bank-borrower relationships.

⁹ Admittedly, a proxy for soft information or a variable that captures the lending relationship between the firm and the bank would have been a better measure to test the impact of foreign bank presence on firms' credit constraints which for instance was possible in the Japanese survey data employed by Kano et al. (2011). However, given the lack of such information, the best we could do is an indirect test of the cherry-picking hypothesis by interacting our measure of foreign bank presence with the hard information variable we create in order to examine the impact of foreign banks on firms' credit constraints.

Table 2
Summary Statistics.
Source: Authors

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
NCC	38,577	0.388651	0	0.48745	0	1
PCC	38,577	0.193561	0	0.395094	0	1
MCC	38,577	0.345102	0	0.475408	0	1
FCC	38,577	0.087332	0	0.282324	0	1
FinAud	38,577	0.497576	0	0.500001	0	1
lnAge	38,577	2.771624	2.7725	0.724741	0	5.351858
Export	38,577	0.276331	0	0.447188	0	1
Small	38,577	0.469373	0	0.499068	0	1
Medium	38,577	0.331311	0	0.470691	0	1
Quality Certification	38,577	0.216347	0	0.411759	0	1
Public	38,577	0.051352	0	0.220717	0	1
Private	38,577	0.575939	1	0.494206	0	1
Foreign	38,577	0.082459	0	0.275066	0	1
Government	38,577	0.00337	0	0.057954	0	1
Experience	38,577	19.03997	17	11.2936	0	70
GDP per capita	38,577	8.237792	8.568	1.378301	0.086296	10.14443
Inflation	38,577	0.109161	0.0516	0.402587	-0.00944	3.326
Getting Credit	38,577	5.515333	5	2.238114	0	10
Credit information	38,577	3.953081	5	2.184291	0	6
Private credit	37,580	37.89527	30.12	23.11773	10.38	128.5
Legal Rights	38,577	-0.30951	-0.5	0.605168	-1.78	1.34
BankZ	38,577	12.47455	8.4	9.434966	-0.34	46.61
FBTA	38,577	43.73995	37	28.80834	1	99
Foreign bank count	38,577	47.0807	43	21.80499	3	88
CR3	38,577	55.04149	52.26	14.82905	23.67	98.87
Boone	38,577	-0.0699	-0.07	0.156059	-1.21	0.43
Lerner	34,696	0.276005	0.27	0.088969	-0.02	0.49

The presence of such certification can mitigate the screening cost to the potential lender in determining the repayment capacity of otherwise opaque borrower. In the absence of such indicators a firm might face difficulty in obtaining access to external finance. Therefore, we denote firms that have received an internationally recognized quality certification as a binary variable equal to 1 and 0 otherwise.

In terms of the country level control variables, we control for changes in the macroeconomic environment by including the real GDP per capita and inflation rate. We also control for levels of financial sector development proxied by the value of domestic credit to private sector as percentage of GDP. All these variables are taken from the World Bank's World Development indicators.

We then augment our model with a set of institutional variables that capture the quality of legal environment, quality of the information environment at the aggregate level as well rule of law. While for the legal environment, we use the strength of legal rights, for quality of aggregate information, we rely on the depth of credit information sourced from World Bank's Doing Business database. Increased credit information availability improves lenders knowledge of potential borrower which facilitate lending decisions. Depth of credit information is an index (ranges from zero to six) which measures rules affecting the scope, the accessibility, and the quality of credit information available through either public or private credit registries. We also control for rule of law, an indicator of institutional development, obtained from the *Worldwide Governance Indicators (WGI)*. It captures the perceptions of the extent to which agents have confidence in the quality of contract enforcement, property rights, the police, and the courts.

Our model also factors in banking competition which can be beneficial or detrimental to access to finance. To control for banking competition, we use available measures of bank competition (Lerner Index, Boone indicator) as well as alternatively use banking concentration as additional control variables. Table 2 furnishes the summary statistics with all the essential information about the variables we have used in our empirics.

Finally, following the empirical tradition in estimating such firm level models, we control for industry and year effects by adding a group of relevant dummy variables, along with clustering our standard errors which allows us to correct for within-country error correlations. We also undertake a variety of robustness checks to check the validity of our baseline results, as will be elaborated in the next section.

4. Empirical findings

4.1. Graphical analysis

Before we discuss our empirical results, we offer a graphical analysis to illustrate the salient features of some of the key variables in our sample. More specifically, Fig. 2 shows the magnitude of credit constraints across the different regions in our dataset. We can note that there is a heterogeneous distribution across firms when it comes to their extent of credit constraints across regions.

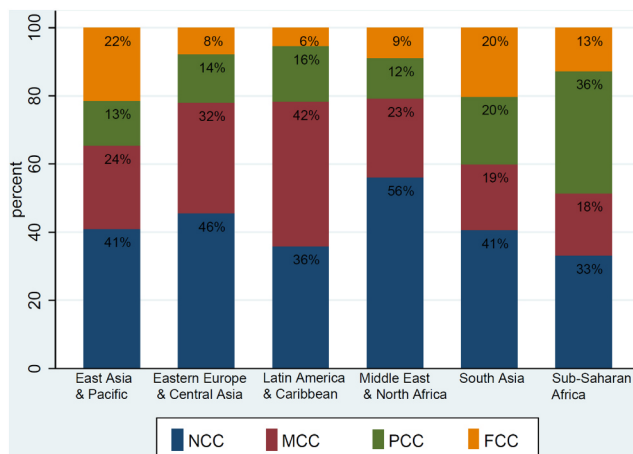


Fig. 2. Credit Constraints by Region. Source: Authors

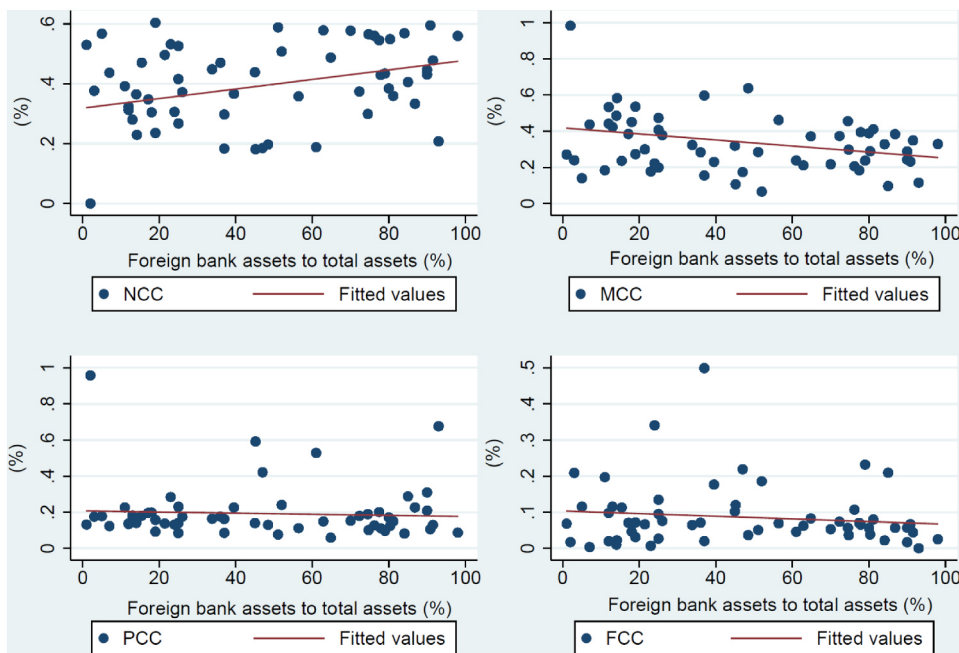


Fig. 3. Relationship between Foreign Bank Presence and Credit Constraints. Note: The vertical axis in each panel shows the respective proportion of firms in each category of credit constraints constructed for our sample of EMDEs. Source: Authors.

For instance, firms in the Asian region including both East Asia & the Pacific as well as South Asia seem to have a relatively higher proportion of fully credit constrained firms compared to the other regions. Interestingly, at the other end of the spectrum, the proportion of firms that are not credit constrained at all (based on our measure) exceed about 35 percent on average across all the regions. There is no obvious clustering pattern across regions although we can see that Latin America & Caribbean hosts the highest share of firms that fall under the maybe credit constrained category (42 percent), followed by Eastern Europe and Central Asia with a 32 percent share in the corresponding category. We can also find that Sub-Saharan Africa hosts the higher proportion of firms that are partially credit constrained when compared across the regions.

Fig. 3 presents some simple scatterplots between the key variables of interest to this paper – foreign bank presence and credit constraints. We map each category of credit constraints with foreign bank assets. Interestingly, while we can observe a positive relationship between foreign bank assets and firms with no credit constraints, we see a negative tending relationship between other categories of credit constraints and foreign bank presence. The latter appears to be imply that greater presence of foreign banks tends to actually reduce credit constraints. However, we turn to more formal empirical tests to establish the relationship between foreign

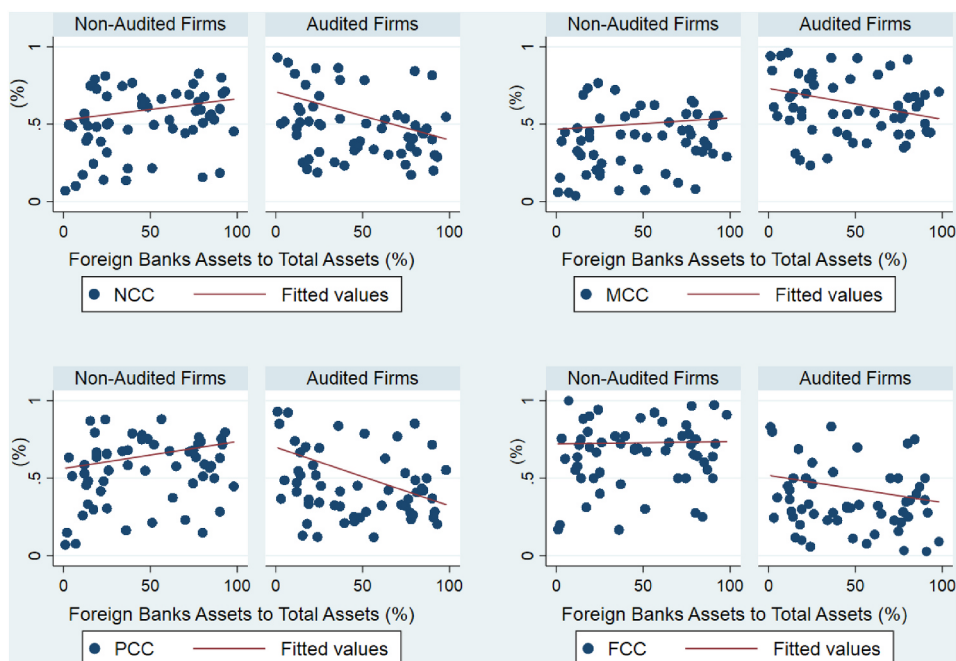


Fig. 4. Relationship between Foreign Bank Presence and Credit Constraints based on Auditing Status of the Firm.

Note: The vertical axis in each panel shows the respective proportion of firms in each category of credit constraints split based on their auditing status for our sample of EMDEs.

Source: Authors

banks and firms credit constraints.

Finally, before we turn to our formal empirical results, we graphically illustrate the relationship between foreign bank presence and credit constraints based on the auditing status of the firms in our sample¹⁰. Quite interestingly, we can observe that foreign bank presence largely tend to ease credit constraints for audited firms relative to non-audited firms. Considering that these correlations are merely suggestive, we now turn to discussing the results of our ordered probit estimation (Fig. 4).

4.2. Estimation results

First, we start with our baseline results, given in Table 3a. To recall, the dependent variable of interest is our constructed measure of firms' credit constraints which is an ordinal variable and we model it as a function of foreign bank presence, financial auditing statements which is our proxy for hard information, the interaction between the two variables of interest, controlling for a vector of firm-level and country-level variables listed above. In columns (1) and (2), we use the preferred proxy for foreign bank presence given by the share of foreign bank assets in an economy, while the last two columns of Table 3a replicate the results using the number of foreign banks as an alternative measurement of foreign bank presence. Further, to account for the possibility of the impact of the global financial crisis (GFC), we re-run our baseline estimation to include a GFC dummy covering the period 2007-09 and the results are shown in Table 3b. It is notable that there appears to be no discernible impact of the global financial crisis on our main results, adding an additional layer of robustness to our baseline results.

The estimates of our ordered probit model reveal three significant results. First, we see that the coefficient of foreign bank presence enters the regression with a negative sign and carries high statistical significance. We interpret these results as evidence for foreign bank presence tending to ease firms' credit constraints in our sample of EMDEs. Recall that our dependent variable is constructed in such a way that increasing order of intensity from 1 to 4 is indicative of higher credit constraints for the firms. Hence the negative sign for foreign bank presence appears to allude to the fact that greater financial liberalization in the form of foreign bank presence tends to have a positive impact in terms of access to credit for firms in general, irrespective of size differences. Alternatively, we can argue that in line with the market power hypothesis, healthy competition in the banking system through greater foreign bank presence results in a reduction in the cost of finance for firms translating into greater availability of credit for them.

It is important to underline that the signs persistently remain negative and consistent when we use alternative measure (number of foreign banks) of foreign bank presence. Although the statistical significance of the results is inconsistent (as shown in Columns 3 and 4), we interpret it with caution as number of foreign banks is not the ideal proxy for measuring foreign bank presence in a country, as has also been emphasized by the literature.

¹⁰ We thank an anonymous reviewer for making this suggestion.

Table 3a
Foreign Banks and Firms Credit Constraints: Baseline Estimates.
Source: Authors

Dep Var: Firms Credit Constraints	(1) FBP	(2) FBP	(3) FB Count	(4) FB Count
Foreign Bank Presence	-0.00316** (0.00128)	-0.00499*** (0.00119)		
Foreign bank count			-0.00223 (0.00154)	-0.00340* (0.00183)
FinAud	-0.250*** (0.0824)	-0.251*** (0.0792)	-0.330*** (0.0933)	-0.323*** (0.0879)
FBP * FinAud	0.00375*** (0.00130)	0.00623*** (0.00156)		
FBP *Small		0.00199 (0.00157)		
FBP *Small* FinAud		-0.00313** (0.00132)		
FBP *Medium		0.00180 (0.00116)		
FBP *Medium* FinAud		-0.00254** (0.00104)		
FB count* FinAud			0.00530*** (0.00151)	0.00816*** (0.00170)
FB count*Small				0.00120 (0.00198)
FB count*Small* FinAud				-0.00389*** (0.00117)
FB count*Medium				0.00113 (0.00144)
FB count*Medium* FinAud				-0.00308*** (0.000814)
lnAge	-0.0118 (0.0130)	-0.0132 (0.0130)	-0.00996 (0.0134)	-0.0118 (0.0133)
Export	0.0104 (0.0263)	0.00990 (0.0263)	0.0109 (0.0279)	0.0107 (0.0278)
Small	0.0749** (0.0343)	0.0777 (0.0652)	0.0702** (0.0345)	0.130 (0.0861)
Medium	0.000481 (0.0225)	0.00425 (0.0423)	-0.00108 (0.0227)	0.0500 (0.0619)
Quality Certification	-0.0829*** (0.0227)	-0.0840*** (0.0229)	-0.0830*** (0.0226)	-0.0849*** (0.0230)
Private	-0.0629 (0.0397)	-0.0621 (0.0394)	-0.0666 (0.0410)	-0.0655 (0.0405)
Foreign	-0.225** (0.0277)	-0.228** (0.0277)	-0.231** (0.0269)	-0.235** (0.0267)
Government	-0.0287 (0.0769)	-0.0301 (0.0776)	-0.0322 (0.0761)	-0.0347 (0.0766)
Public	-0.0837 (0.0509)	-0.0857* (0.0506)	-0.101* (0.0524)	-0.105** (0.0517)
Experience	-4.47e-05 (0.000800)	-3.45e-06 (0.000799)	9.78e-05 (0.000823)	0.000156 (0.000824)
GDP per capita	-0.105** (0.0528)	-0.106** (0.0526)	-0.0996* (0.0570)	-0.100* (0.0568)
Inflation	0.759 (1.048)	0.766 (1.046)	0.843 (1.100)	0.854 (1.097)
Getting Credit	-0.0100 (0.0140)	-0.00955 (0.0139)	-0.0198 (0.0128)	-0.0198 (0.0127)
Credit information	0.000209 (0.0170)	5.64e-05 (0.0170)	-0.00216 (0.0173)	-0.00235 (0.0172)
Private credit	-0.00522*** (0.00169)	-0.00519*** (0.00168)	-0.00456** (0.00185)	-0.00449** (0.00183)
Legal Rights	0.0438 (0.0693)	0.0435 (0.0691)	-0.00137 (0.0739)	-0.00340 (0.0737)
Time dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Observations	37,578	37,578	37,578	37,578

Notes: Standard errors (in parentheses) are clustered at the country-year level.

*** p < 0.01.

** p < 0.05.

* p < 0.1.

Table 3b
Accounting for the Impact of Global Financial Crisis.

Dep Var: Firms Credit Constraints	(1) FBP	(2) FBP	(3) FB Count	(4) FB Count
Foreign Bank Presence	-0.00321** (0.00127)	-0.00503*** (0.00119)		
Global Financial Crisis	0.0256 (0.104)	0.0241 (0.104)	-0.0206 (0.104)	-0.0229 (0.104)
Foreign bank count			-0.00220 (0.00153)	-0.00337* (0.00181)
FinAud	-0.250*** (0.0819)	-0.251*** (0.0786)	-0.330*** (0.0930)	-0.323*** (0.0876)
FBP * FinAud	0.00375*** (0.00130)	0.00623*** (0.00155)		
FBP *Small		0.00199 (0.00157)		
FBP *Small* FinAud		-0.00313** (0.00132)		
FBP *Medium		0.00180 (0.00116)		
FBP *Medium* FinAud		-0.00253** (0.00104)		
FB count* FinAud			0.00531*** (0.00150)	0.00818*** (0.00171)
FB count*Small				0.00121 (0.00198)
FB count*Small* FinAud				-0.00390*** (0.00118)
FB count*Medium				0.00114 (0.00144)
FB count*Medium* FinAud				-0.00308*** (0.000819)
lnAge	-0.0115 (0.0132)	-0.0129 (0.0132)	-0.0102 (0.0136)	-0.0121 (0.0135)
Export	0.0102 (0.0260)	0.00965 (0.0260)	0.0111 (0.0279)	0.0109 (0.0278)
Small	0.0753** (0.0337)	0.0782 (0.0643)	0.0698** (0.0337)	0.130 (0.0856)
Medium	0.000733 (0.0222)	0.00444 (0.0422)	-0.00133 (0.0224)	0.0498 (0.0619)
Quality Certification	-0.0831*** (0.0227)	-0.0843*** (0.0229)	-0.0828*** (0.0226)	-0.0847*** (0.0229)
Private	-0.0629 (0.0399)	-0.0621 (0.0396)	-0.0666 (0.0409)	-0.0656 (0.0403)
Foreign	-0.225*** (0.0275)	-0.227*** (0.0275)	-0.231*** (0.0267)	-0.235*** (0.0265)
Government	-0.0299 (0.0770)	-0.0312 (0.0776)	-0.0315 (0.0760)	-0.0340 (0.0766)
Public	-0.0844* (0.0503)	-0.0862* (0.0500)	-0.100* (0.0511)	-0.104** (0.0504)
Experience	-4.49e-05 (0.000803)	-3.68e-06 (0.000802)	9.70e-05 (0.000819)	0.000155 (0.000820)
GDP per capita	-0.106** (0.0523)	-0.107** (0.0520)	-0.0985* (0.0553)	-0.0992* (0.0550)
Inflation	0.709 (1.054)	0.719 (1.052)	0.883 (1.125)	0.898 (1.123)
Getting Credit	-0.0102 (0.0140)	-0.00971 (0.0139)	-0.0196 (0.0128)	-0.0195 (0.0128)
Credit information	0.000639 (0.0168)	0.000462 (0.0168)	-0.00257 (0.0163)	-0.00281 (0.0162)
Private credit	-0.00530*** (0.00162)	-0.00527*** (0.00160)	-0.00450** (0.00181)	-0.00442** (0.00178)
Legal Rights	0.0452 (0.0683)	0.0448 (0.0681)	-0.00232 (0.0728)	-0.00445 (0.0727)
Time dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Observations	37578	37578	37578	37578

In addition to the finding that higher foreign bank presence in EMDEs tends to reduce credit constraints, the second important result that emerges is that firms with audited financial statements tend to experience a reduction in credit constraints. The coefficient

Table 4
Controlling for Banking Concentration.
Source: Authors

Dep Var: Firms Credit Constraints	(1) H-stat	(2) Lerner	(3) Boone	(4) CR3
Foreign Bank Presence	-0.0138*** (0.00398)	-0.00389** (0.00164)	-0.00487*** (0.00112)	-0.00234 (0.00270)
FBP*Lerner		-0.000136** (6.39e-05)		
FinAud	-0.290*** (0.0729)	-0.256*** (0.0768)	-0.203*** (0.0634)	-0.257*** (0.0756)
FBP*FinAud	0.00577*** (0.00172)	0.00742*** (0.00149)	0.00543*** (0.00132)	0.00631*** (0.00150)
FBP*Small	0.00104 (0.00154)	0.00258 (0.00189)	0.00193 (0.00155)	0.00194 (0.00156)
FBP*Small*FinAud	-0.00238* (0.00128)	-0.00430*** (0.00137)	-0.00318** (0.00132)	-0.00303** (0.00129)
FBP*Medium	0.00180 (0.00147)	0.00219 (0.00141)	0.00173 (0.00115)	0.00171 (0.00113)
FBP*Medium*FinAud	-0.00292** (0.00141)	-0.00329*** (0.000972)	-0.00264** (0.00103)	-0.00247** (0.000999)
Small	0.123* (0.0673)	0.0723 (0.0659)	0.0839 (0.0662)	0.0810 (0.0657)
Medium	0.0499 (0.0511)	0.00234 (0.0425)	0.0110 (0.0443)	0.0100 (0.0426)
Lerner		0.00872** (0.00397)		
FBP*Hstat	0.00409** (0.00195)			
H stat	-0.264* (0.136)			
FBP*Boone Index			-4.75e-05 (3.37e-05)	
Boone			0.00450*** (0.00147)	
FBP*CR3				-0.0839 (0.133)
CR3				16.27*** (5.491)
Observations	16,419	34,258	37,237	37,578

Notes: Standard errors (in parentheses) are clustered at the country-year level.

*** p < 0.01.

** p < 0.05.

* p < 0.1.

of our information availability variable is negative once again, similar to the foreign bank variable, implying that greater information availability on its own can be positively associated with easing of credit constraints for firms. This is also suggestive of the importance of policy interventions to promote greater information transparency among firms.

The third important result that emerges from our baseline results is our finding on the interaction term between foreign bank presence and hard information, which appears a bit counter-intuitive at first glance. To be sure, we find the direction of coefficient to be positive. The economic interpretation of the coefficient is not quite meaningful because credit constraints is an ordinal variable and one of our interaction terms is also a dummy variable. Hence the direction of the coefficient provides far greater information about the relationship than the magnitude per se. The seemingly counter-intuitive result arises because the positive interaction term suggests that given that firms audit their statements, higher foreign bank presence is likely to increase credit constraints for the firms.

While it appears as if these are inconsistent with the earlier findings emphasized from the relationship between foreign banks and credit constraints, we would like to argue that on the contrary, these results are not only consistent with our earlier findings but also conform to other findings of the literature as [Berger and Udell \(2006\)](#) noted earlier in the paper. To be sure, we can interpret this result in two possible ways.

First, consistent with the arguments in [Berger and Udell \(2006\)](#) it is possible that foreign banks rely largely on other screening techniques that are not effectively captured in audited financial statements. If this is true, then it is perhaps indicating the need to have better proxies capturing the other screening techniques which could provide a clearer indication of the relationship between foreign banks and credit constraints.

The second interpretation is that foreign banks actually tend to aggravate firms credit constraints when they are able to better monitor their audited statements implying that their decisions to assess their creditworthiness have been helped by the availability of hard information about firms, which is quite intuitive. However, this result in and of itself is not revealing anything about the cherry-

Table 5
Country Level Variables (Stepwise).
Source: Authors

Dep Var: Firms Credit Constraints	(1) GDPPC	(2) Infl	(3) Cr	(4) Cr Info	(5) Pvt Cr	(6) Legal
Foreign Bank Presence	−0.0047 ^{***} (0.00119)	−0.00534 ^{***} (0.00110)	−0.0049 ^{***} (0.00121)	−0.00508 ^{***} (0.00118)	−0.0056 ^{***} (0.00103)	−0.0043 ^{***} (0.00112)
FinAud	−0.259 ^{***} (0.0815)	−0.247 ^{***} (0.0711)	−0.230 ^{***} (0.0743)	−0.242 ^{***} (0.0791)	−0.236 ^{***} (0.0753)	−0.237 ^{***} (0.0726)
FBP*FinAud	0.00618 ^{***} (0.00159)	0.00563 ^{***} (0.00141)	0.00554 ^{***} (0.00143)	0.00563 ^{***} (0.00149)	0.00615 ^{***} (0.00154)	0.00594 ^{***} (0.00146)
FBP*Small	0.00224 (0.00154)	0.00231 (0.00157)	0.00201 (0.00153)	0.00220 (0.00153)	0.00198 (0.00162)	0.00219 (0.00152)
FBP*Small*FinAud	−0.00333 ^{**} (0.00133)	−0.00312 ^{**} (0.00130)	−0.00297 ^{**} (0.00127)	−0.00312 ^{**} (0.00128)	−0.00299 ^{**} (0.00133)	−0.00326 ^{**} (0.00131)
FBP*Medium	0.00211 [†] (0.00117)	0.00207 [†] (0.00115)	0.00191 [†] (0.00113)	0.00204 [†] (0.00114)	0.00174 (0.00117)	0.00206 [†] (0.00112)
FBP*Medium* FinAud	−0.0028 ^{***} (0.00106)	−0.00245 ^{**} (0.00101)	−0.00236 ^{**} (0.000994)	−0.00252 ^{**} (0.00101)	−0.00232 ^{**} (0.00105)	−0.00264 ^{**} (0.00105)
Small	0.0714 (0.0661)	0.0555 (0.0605)	0.0591 (0.0624)	0.0634 (0.0639)	0.0699 (0.0634)	0.0719 (0.0631)
Medium	−0.00155 (0.0428)	−0.0135 (0.0394)	−0.0118 (0.0398)	−0.00601 (0.0416)	−0.00139 (0.0403)	−0.00325 (0.0407)
GDP per capita	−0.149 ^{***} (0.0363)					
Inflation		2.193 ^{**} (0.982)				
Getting credit			−0.0117 (0.0157)			
Credit information				−0.0358 ^{**} (0.0182)		
Private credit					−0.0071 ^{***} (0.0015)	
Legal Rights						−0.174 ^{***} (0.0492)
Other firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,575	38,575	38,575	38,575	37,578	38,575

Notes: Standard errors (in parentheses) are clustered at the country-year level;

*** p < 0.01.

** p < 0.05.

* p < 0.1.

picking behavior of foreign banks because size of the firms have not been explicitly factored into account here.

To capture that effect, we introduce a triple interaction term that explicitly adds the size of the firm in the interaction term and we find that there is no evidence of “cherry-picking” behavior as the net direction of the coefficient is negative. The coefficient is also statistically significant at the 5 percent level. This is suggestive that for micro, small and medium firms, in relation to the large firms, greater information availability through audited financial statements jointly associated with greater foreign bank presence tends to ease firm credit constraints, which is an important result from the policy point of view.

4.3. Robustness checks

We undertake five different robustness exercises to verify the consistency of our baseline results. First, we re-estimate the model by controlling for standard measures of banking competition and concentration. Next, we introduce our country level macro variables in a stepwise fashion to see if our baseline results are sensitive to the choice of their inclusion. Third, we check if the fundamental results continue to hold at all levels of foreign bank presence or whether they vary by degrees of foreign bank penetration. Fourth, as an extension of application of thresholds, we also empirically test if our empirical results are robust when we factor in the income levels of the countries more explicitly by splitting the sample based on income classifications. Finally, we check if the baseline results remain robust when we control for the distinction between public and private firms in our sample.

We start with re-estimating our model by accounting for banking competition and concentration. Table 4 summarizes the results. There is a tangential strand of literature indicating that the impact of foreign banks on financial inclusion could be possibly affected by the interaction between foreign bank presence and higher banking concentration. Specifically, following the structure-conduct-performance hypothesis, studies point out that any economy with higher banking concentration could, in some circumstances, lead to lower competition. This could potentially negate the plausible beneficial impacts of foreign banks on financial inclusion (For a

Table 6
Threshold Effects of Foreign Bank Presence.
Source: Authors

Dep Var: Firms Credit Constraints	(1) Q1	(2) Q2	(3) Q3	(4) < Mean	(5) > = Mean	(6) < Median	(7) > Median
Foreign Bank Presence	0.0129* (0.00724)	-0.0113 (0.00954)	-0.00857* (0.00475)	-0.00150 (0.00528)	-0.00834** (0.00353)	-0.0104 (0.00636)	-0.00634* (0.00338)
FinAud	-0.229 (0.142)	0.0435 (0.149)	-0.244 (0.173)	-0.199* (0.107)	-0.307** (0.122)	-0.183 (0.121)	-0.245** (0.114)
FBP*FinAud	0.0171* (0.00981)	0.000934 (0.00466)	0.00495** (0.00214)	0.0104** (0.00483)	0.00594*** (0.00167)	0.0142** (0.00649)	0.00524*** (0.00169)
FBP*Small	0.0200* (0.0109)	0.00371 (0.00704)	0.00923* (0.00483)	0.0107 (0.00706)	0.00565* (0.00299)	0.0173** (0.00737)	0.00335 (0.00320)
FBP*Small* FinAud	-0.0175*** (0.00652)	-0.00348 (0.00232)	-0.00239* (0.00135)	-0.0103** (0.00402)	-0.00236* (0.00132)	-0.0154*** (0.00413)	-0.00235* (0.00131)
FBP*Medium	0.00860 (0.00596)	0.000748 (0.00586)	0.00767** (0.00385)	0.00555 (0.00450)	0.00549*** (0.00205)	0.0113*** (0.00435)	0.00452** (0.00208)
FBP* Medium* FinAud	-0.00680* (0.00374)	-0.00551** (0.00272)	-0.00189* (0.00107)	-0.00655** (0.00283)	-0.00219** (0.00108)	-0.0105*** (0.00285)	-0.00220** (0.00107)
Small	-0.0576 (0.134)	-0.00371 (0.265)	-0.560 (0.379)	-0.000791 (0.113)	-0.246 (0.207)	-0.0359 (0.119)	-0.0790 (0.220)
Medium	-0.0267 (0.0735)	0.0863 (0.224)	-0.497* (0.290)	-0.00239 (0.0631)	-0.297** (0.142)	-0.0357 (0.0674)	-0.225 (0.139)
Other Firm- and Country-level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,803	10,643	13,132	19,581	17,997	17,922	18,752

Notes:

- a. Standard errors (in parentheses) are clustered at the country-year level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
b. Since the mean FBP is 43%, we divide sample firms into two categories those above and below mean FBTA. Results of the sample split is given in columns 4&5.
c. Since the median FBP is 37%, we divide sample firms into two categories those above and below median FBP. Results of the sample split is given in columns 6&7.

Table 7
Income Classification.
Source: Authors

Dep Var: Firms Credit Constraints	(1) Lower	(2) Middle	(3) High
Foreign Bank Presence	-0.0145** (0.00727)	-0.00534*** (0.00131)	-0.00543** (0.00240)
FinAud	-0.573** (0.246)	-0.239*** (0.0790)	0.00372 (0.0970)
FBP* FinAud	0.0149*** (0.00565)	0.00544*** (0.00161)	0.00452** (0.00219)
FBP*Small	0.00554 (0.00704)	0.00150 (0.00188)	0.00491** (0.00225)
FBP*Small* FinAud	-0.00802 (0.00578)	-0.00213 (0.00143)	-0.00492** (0.00226)
FBP*Medium	0.00469 (0.00726)	0.00142 (0.00124)	0.00388* (0.00200)
FBP*Medium* FinAud	-0.00842* (0.00478)	-0.00189* (0.00113)	-0.00373** (0.00182)
Small	0.319 (0.238)	0.0641 (0.0716)	-0.0493 (0.0857)
Medium	0.252* (0.152)	0.00280 (0.0464)	-0.0427 (0.0496)
Other Firm- and Country-level controls	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Observations	2,546	30,075	4,957

Notes:

- a. Standard errors (in parentheses) are clustered at the country-year level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
b. World Bank groupings of countries based on income as Low Income Countries (LICs), Lower Middle Income Countries (LMICs), Upper Middle Income Countries (UMICs), and High Income Countries (HICs).

Table 8
Foreign Banks and Firms' Credit Constraints: Private vs. State Firms.

Dep Var: Firms Credit Constraints	(1) FBP	(2) FBP	(3) FB Count	(4) FB Count
Foreign Bank Presence	-0.00323** (0.00128)	-0.00508*** (0.00120)		
FinAud	-0.252*** (0.0823)	-0.254*** (0.0792)	-0.333*** (0.0931)	-0.326*** (0.0878)
FBTA * FinAud	0.00376*** (0.00130)	0.00623*** (0.00156)		
FBTA *Small		0.00202 (0.00157)		
FBTA *Small* FinAud		-0.00310** (0.00131)		
FBTA *Medium		0.00183 (0.00116)		
FBTA *Medium* FinAud		-0.00252** (0.00104)		
Foreign bank count			-0.00234 (0.00153)	-0.00356** (0.00182)
Foreign bank count* FinAud			0.00531*** (0.00151)	0.00815*** (0.00171)
Foreign bank count*Small				0.00125 (0.00198)
Foreign bank count*Small* FinAud				-0.00385*** (0.00117)
Foreign bank count*Medium				0.00118 (0.00145)
Foreign bank count*Medium* FinAud				-0.00305*** (0.00105)
lnAge	-0.0139 (0.0130)	-0.0153 (0.0129)	-0.0125 (0.0133)	-0.0144 (0.0133)
Export	0.00917 (0.0263)	0.00860 (0.0263)	0.00963 (0.0280)	0.00936 (0.0279)
Small	0.0824** (0.0344)	0.0839 (0.0652)	0.0795** (0.0349)	0.137 (0.0859)
Medium	0.00516 (0.0222)	0.00752 (0.0423)	0.00467 (0.0227)	0.0531 (0.0622)
Quality Certification	-0.0857*** (0.0229)	-0.0869*** (0.0232)	-0.0864*** (0.0228)	-0.0884*** (0.0232)
Private dummy	-0.0481 (0.0355)	-0.0471 (0.0351)	-0.0486 (0.0371)	-0.0468 (0.0366)
Foreign	-0.227*** (0.0275)	-0.230*** (0.0275)	-0.233*** (0.0267)	-0.238*** (0.0265)
Experience	2.33e-05 (0.000813)	6.57e-05 (0.000812)	0.000180 (0.000837)	0.000240 (0.000837)
GDP per capita	-0.109** (0.0527)	-0.110** (0.0524)	-0.106* (0.0570)	-0.107* (0.0568)
Inflation	0.769 (1.047)	0.776 (1.045)	0.856 (1.101)	0.868 (1.098)
Getting Credit	-0.00969 (0.0140)	-0.00922 (0.0138)	-0.0195 (0.0127)	-0.0194 (0.0127)
Credit information	0.000547 (0.0172)	0.000406 (0.0172)	-0.00147 (0.0176)	-0.00161 (0.0175)
Private credit	-0.00529*** (0.00171)	-0.00527*** (0.00170)	-0.00464** (0.00187)	-0.00458** (0.00185)
Legal Rights	0.0505 (0.0700)	0.0503 (0.0698)	0.00731 (0.0741)	0.00573 (0.0739)
Time dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Observations	37,578	37,578	37,578	37,578

detailed discussion, see [Gopalan & Rajan, 2018](#) and references cited within).

However, considering that there is a distinction between banking concentration and banking competition, ([Van Leuvensteijn, Bikker, van Rixtel, & Sørensen, 2011](#); [Carbo-Valverde, Humphrey, Maudos, & Molyneux, 2009](#)) we re-run our baseline model to capture the effects of both banking concentration and banking competition in terms of how foreign banks affect firms' access to credit. Interestingly, while the baseline results remain unaffected to the inclusion and concentration and competition variables, we also find that the interaction of foreign banks and bank competition (as given by the Lerner index) produces a negative and

statistically significant coefficient. This seems to suggest that when foreign bank presence is associated with higher banking competition, it tends to reduce the credit constraints of firms. However, the interaction between foreign banks and banking concentration, as captured by the three-bank concentration ratio, does not appear to generate any statistically significant impact although the coefficient still remains negative.

In the next robustness exercise, we focus on introducing our country variables in the estimation in a step-wise fashion to ensure that our fundamental relationships of interest are robust to the choice of our control variables in the model. Table 5 summarizes the results. We can observe how foreign bank presence on its own persistently eases credit constraints while greater information availability also tends to reduce firms' credit constraints. In addition, for almost all specifications, consistently we also find the interaction term to be positive and highly significant in line with the baseline results discussed earlier.

Having established that our results are fairly robust so far, we would like to investigate if thresholds in terms of foreign bank presence matter in the way they affect credit access to firms. At the macro level, there is evidence in the related literature on foreign bank presence that the real impact of foreign banks can vary by thresholds. For instance, Gopalan and Rajan (2017) find that countries that have a high degree of foreign bank presence above a certain threshold tend to experience greater interest rate transmission in their economies relative to those where foreign bank presence is below a particular threshold. This could be of particular interest to several EMDEs which have different degrees of foreign bank presence. Thus, we empirically test if the impact of foreign bank presence on firms' credit constraints actually changes with different threshold levels of foreign bank presence. To do this, we split our sample into three quartiles and also alternatively use the mean and median foreign bank asset share as the cut-off points. Table 6 furnishes the results.

The first three columns show our results for the three quartiles of foreign bank presence. The results are ambiguous at best. Despite the weak statistical significance, we can see that foreign bank presence on its own carries a negative sign only in the second and third quartiles suggesting that there could be an element of threshold effect at work. In the first quartile, contrary to all the results we have found so far, foreign bank presence yields a positive coefficient for the first time, indicating that at very low levels of foreign bank presence they tend to increase credit constraints for firms. In other words, in EMDEs, the possibility of such policies to ease firm credit constraints increase with greater presence of foreign banks. However, when we split the sample using mean foreign bank assets as the threshold (columns 4 and 5), we find that the direction of the coefficient is negative for both below and above mean sample although only the high threshold sample produces a statistically significant result. This is also true when we use median as the threshold instead of the mean, which can be observed from results shown in columns 6 and 7 of Table 6.

Interestingly, the other variables of interest produce consistent results both in terms of signs and statistical significance with the baseline results. We find that the small and medium firms are less credit constrained when foreign bank presence is interacted with greater information availability as captured in the triple interaction terms. This result seems to hold regardless of the degree of foreign bank presence, suggesting that thresholds do not appear to play that significant a role in determining firms' credit constraints.

As an extension of this exercise, we explicitly factor in the income levels of the countries in our sample to see if the estimation results vary. Table 7 shows the results of our regression that splits the sample into lower, middle and high income countries. We find that irrespective of the income differences, foreign bank presence appears to produce beneficial impacts for firms by reducing their credit constraints. We also find that the direction of coefficient of our triple interaction term to be negative, consistent with our results so far, although it is statistically significant only in the high income sample.

As our final robustness check, we include a dummy variable for private firms in our sample, with the reference category being public firms to verify if this distinction matters in affecting our key results established so far.¹¹ Yet again, our key estimation results remain consistent and robust to the recognition of the distinction between public and private firms. The results are summarized in Table 8.

5. Conclusion

In this paper, we have attempted to empirically examine the relationship between foreign bank presence in emerging market and developing economies (EMDEs) and firms' credit constraints. With financial liberalization in the form of foreign bank presence taking increasing prominence in several EMDEs, there is a growing interest in the academic literature assessing the multi-dimensional impacts of foreign bank presence in EMDEs. One of the oft-noted concerns about the implications of foreign bank presence pertain to their impact on financial inclusion. While foreign banks can contribute to reduced costs of financial intermediation which could result in increased credit availability, there is greater ambiguity about the relationship between foreign bank presence and firms' access to credit.

Using a firm-level sample of 37,578 observations representing 60 EMDEs covering the time period 2006 to 2014, we employ an ordered probit model on cross-sectional data to understand empirically how foreign banks affect firms' access to credit. One of the important value-additions of our paper is to construct a comprehensive measure of firms' credit constraints from disaggregated firm-level data sourced from the World Bank Enterprise Survey (WBES). We combine this data with available country-data to construct a novel and comprehensive measure capturing firms' credit constraints as well as information verifiability of firms of varying sizes.

Our empirical results show evidence for foreign bank presence tending to ease firms' credit constraints in our sample of EMDEs. We also find that firms with audited financial statements tend to experience a reduction in credit constraints. Further, we also find strong evidence that for micro, small and medium firms, in relation to the large firms, greater information availability through

¹¹ We thank an anonymous reviewer and the editors for making this suggestion.

audited financial statements jointly associated with greater foreign bank presence tends to ease firm credit constraints.

These results are not only noteworthy but also have significant policy implications. The findings of our paper point to the beneficial impacts of foreign bank presence in EMDEs, a point that is consistent with the growing literature on foreign bank presence in EMDEs. Further, our results also indicate the importance of the provision of the requisite contractual and informational framework to enable access to credit for SMEs, which remains a regulatory challenge in several EMDEs. The policymakers could thus draft appropriate regulations helping the SMEs overcome this impediment, which in turn could go a long way in reducing the information asymmetry in the lending process. Finally, we also find that when foreign bank presence is associated with higher banking competition, it tends to reduce the credit constraints of firms.

Acknowledgments

The authors are grateful to the editors and an anonymous reviewer for their valuable inputs and comments on an earlier version, which helped improve the quality of our paper. The authors also thank Radeef Chundakkadan and Ketan Reddy for the excellent research and editorial assistance.

Appendix A

See Tables A2 and A3.

Table A1
Variable Definitions.

Variable Name	Definition	Source
CC	1 if the firm is non-credit constrained (NCC), 2 if it is maybe credit constrained (MCC), 3 if it is partially constrained (PCC), and 4 if it is fully credit constrained (FCC).	WBES (World Bank Enterprise Survey)
Firm Level Variables		
Audited	Dummy variable equals to 1 if the firm have its annual financial statements reviewed and certified by an external auditor	WBES
Size	Small = to 1 if < 20 employees Medium = to 1 if 20-99 employees Large = to 1 > = 100 employees	WBES
Age	Log of number of years in operation	WBES
Export	Dummy variable equals to 1 if firm is an exporter	WBES
Foreign	Dummy variable equals to 1 if firm is owned by a foreign entity	WBES
Government	Dummy variable equals to 1 if 50% or more of the firm is owned by the government	WBES
Public	Dummy variable equals to 1 if the firms is a publicly listed company	WBES
Private	Dummy variable equals to 1 if the firms is a limited liability company	WBES
Experience	Experience in this sector that the top manager has (in years)	WBES
Quality Certification	Dummy variable equals to 1 if the firms possess quality certificate	WBES
Banking Sector characteristics		
Foreign Bank Presence	Assets share of foreign controlled banks in domestic banking system	GFDD(Global Financial Development Database)
Foreign Bank Count	Percentage of foreign banks among total banks	GFDD
HHI	Sum of the squared bank market shares (total assets).	GFDD
CR3	Share of total assets held by the top 3 banks in the system.	GFDD
Lerner	A non-structural measure of competition as measured by the Lerner index.	GFDD
Boone	Value of the Boone index	GFDD
Country Level Controls		
GDP per capita	GDP per capita (Constant USD)	World Development Indicators
Inflation	Annual change in the GDP deflator	World Development Indicators
Private credit	Private credit as % of GDP	World Development Indicators
Credit information	Depth of credit information index is a measure of the coverage, scope and accessibility of credit information available through either a public credit registry or a private credit bureau (0–6)	Doing Business
Legal Rights	The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders (0–10)	Doing Business
Getting Credit	This measures the strength of credit reporting systems and the effectiveness of collateral and bankruptcy laws in facilitating lending.	Doing Business

Table A2
List of Countries.
Source: Authors

	2006	2007	2008	2009	2010	2011	2012	2013	Total # of Observations
Albania	0	177	0	93	0	0	0	269	539
Argentina	914	0	0	0	877	0	0	0	1791
Armenia	0	0	0	234	0	0	0	225	459
Azerbaijan	0	0	0	208	0	0	0	0	208
Bangladesh	0	0	0	0	0	0	0	1309	1309
Belarus	0	0	140	0	0	0	0	0	140
Bolivia	487	0	0	0	194	0	0	0	681
Brazil	0	0	0	1079	0	0	0	0	1079
Bulgaria	0	919	0	175	0	0	0	251	1345
Chile	0	0	0	0	904	0	0	0	904
China	0	0	0	0	0	0	590	0	590
Colombia	916	0	0	0	827	0	0	0	1743
Croatia	0	0	0	132	0	0	0	309	441
Czech Republic	0	0	0	167	0	0	0	202	369
Dominican Republic	0	0	0	0	318	0	0	0	318
Ecuador	560	0	0	0	0	0	0	0	560
El Salvador	515	0	0	0	0	0	0	0	515
Estonia	0	0	0	223	0	0	0	218	441
Georgia	0	0	184	0	0	0	0	263	447
Ghana	0	484	0	0	0	0	0	0	484
Guatemala	461	0	0	0	413	0	0	0	874
Honduras	344	0	0	0	0	0	0	0	344
Indonesia	0	0	0	1006	0	0	0	0	1006
Jamaica	0	0	0	0	239	0	0	0	239
Jordan	0	0	0	0	0	0	0	416	416
Kazakhstan	0	0	0	329	0	0	0	353	682
Kenya	0	0	0	0	0	0	0	593	593
Kyrgyz Republic	0	0	0	0	0	0	0	198	198
Latvia	0	0	0	220	0	0	0	231	451
Lithuania	0	0	0	216	0	0	0	194	410
Mali	0	490	0	0	160	0	0	0	650
Mauritius	0	0	0	341	0	0	0	0	341
Mexico	1150	0	0	0	912	0	0	0	2062
Moldova	0	0	0	265	0	0	0	279	544
Montenegro	0	0	0	69	0	0	0	90	159
Morocco	0	16	0	0	0	0	0	310	326
Nepal	0	0	0	0	0	0	0	441	441
Nicaragua	401	0	0	0	0	0	0	0	401
Pakistan	0	0	0	0	0	0	0	441	441
Panama	886	0	0	0	164	0	0	0	1050
Paraguay	453	0	0	0	301	0	0	0	754
Peru	1094	0	0	0	887	0	0	0	1981
Philippines	0	0	0	868	0	0	0	0	868
Poland	0	0	0	227	0	0	0	300	527
Romania	0	0	0	250	0	0	0	451	701
Russian Federation	0	0	0	603	0	0	0	0	603
Rwanda	0	0	0	0	0	182	0	0	182
Senegal	0	486	0	0	0	0	0	0	486
Serbia	0	0	0	313	0	0	0	322	635
Slovak Republic	0	0	0	152	0	0	0	163	315
Slovenia	0	0	0	261	0	0	0	227	488
South Africa	0	915	0	0	0	0	0	0	915
Tanzania	0	0	0	0	0	0	0	415	415
Turkey	0	0	814	0	0	0	0	0	814
Uganda	0	0	0	0	0	0	0	372	372
Ukraine	0	0	397	0	0	0	0	672	1069
Uruguay	458	0	0	0	440	0	0	0	898
Zimbabwe	0	0	0	0	0	561	0	0	561

Table A3
Country Wise Status of Credit Constraints (%).
Source: Authors

	NCC	PCC	MCC	FCC
Albania	59.55	10.58	23.19	6.68
Argentina	26.74	23.06	40.70	9.49
Armenia	42.92	11.11	39.43	6.54
Azerbaijan	56.73	17.79	13.94	11.54
Bangladesh	37.66	17.49	23.91	20.93
Belarus	23.57	15.71	53.57	7.14
Bolivia	34.80	19.68	38.47	7.05
Brazil	30.49	19.83	45.04	4.63
Bulgaria	56.06	12.64	20.59	10.71
Chile	29.76	8.52	59.73	1.99
China	0.00	0.00	98.31	1.69
Colombia	22.95	16.58	58.29	2.18
Croatia	44.67	20.86	28.80	5.67
Czech Republic	56.91	8.13	32.79	2.17
Dominican Republic	43.71	12.26	43.71	0.31
Ecuador	31.25	13.39	53.39	1.96
El Salvador	38.45	17.09	38.83	5.63
Estonia	56.01	8.62	32.88	2.49
Georgia	48.77	5.82	37.14	8.28
Ghana	18.80	52.89	23.76	4.55
Guatemala	49.66	13.73	29.98	6.64
Honduras	37.21	17.44	37.79	7.56
Indonesia	30.62	13.12	22.17	34.10
Jamaica	43.10	30.96	24.27	1.67
Jordan	52.64	13.94	19.95	13.46
Kazakhstan	47.07	18.04	23.61	11.29
Kenya	47.05	17.54	28.33	7.08
Kyrgyz Republic	43.43	9.60	23.74	23.23
Latvia	57.87	14.86	21.06	6.21
Lithuania	47.80	12.93	34.88	4.39
Mali	18.15	59.23	10.62	12.00
Mauritius	57.77	15.25	21.70	5.28
Mexico	54.56	20.08	18.33	7.03
Moldova	44.85	16.36	32.35	6.43
Montenegro	33.33	22.64	38.36	5.66
Morocco	60.43	9.20	27.30	3.07
Nepal	39.23	22.68	18.37	19.73
Nicaragua	43.89	13.97	31.92	10.22
Pakistan	50.79	24.04	6.58	18.59
Panama	58.86	7.62	28.48	5.05
Paraguay	35.81	11.14	46.15	6.90
Peru	19.69	12.92	63.76	3.63
Philippines	53.00	13.13	27.07	6.80
Poland	56.55	10.06	29.79	3.61
Romania	35.95	14.98	41.08	7.99
Russian Federation	32.34	13.76	44.11	9.78
Rwanda	28.02	18.13	42.31	11.54
Senegal	20.78	67.70	11.52	0.00
Serbia	29.92	18.90	45.51	5.67
Slovak Republic	54.92	12.38	28.89	3.81
Slovenia	41.60	8.40	47.34	2.66
South Africa	53.22	28.42	17.70	0.66
Tanzania	18.55	42.17	17.35	21.93
Turkey	36.49	14.00	48.53	0.98
Uganda	40.59	28.76	9.68	20.97
Ukraine	36.67	22.64	23.01	17.68
Uruguay	37.42	17.93	37.31	7.35
Zimbabwe	18.36	16.22	15.51	49.91

Notes: NCC stands for non-credit constrained; MCC stands for maybe credit constrained; PCC stands for partially credit constrained; FCC stands for fully credit constrained.

References

- Aristizabal-Ramirez, M., Botero-Franco, M. C., & Canavire-Bacarreza, G. (2017). Does financial development promote innovation in developing economies? An empirical analysis. *Review of Development Economics*, 21(3), 475–496.
- Beck, T., Ioannidou, V., & Schäfer, L. (2017). Foreigners vs. natives: Bank lending technologies and loan pricing. *Management Science*. <https://doi.org/10.1287/mnsc.2016.2706>.
- Beck, T. (2007). Financing Constraints of SMEs in Developing Countries: Evidence, Determinants and Solutions. *Journal of International Money and Finance*, 31(2), 401–441.
- Berger, A. N., Miller, N. H., Petersen, M. A., Rajan, R. G., & Stein, J. C. (2005). Does Function Follow Organizational Form? Evidence from the Lending Practices of Large and Small Banks. *Journal of Financial Economics*, 76(2), 237–269.
- Berger, A. N., & Udell, G. F. (2002). Small business credit availability and relationship lending: The importance of bank organisational structure. *Economic Journal*, 112(127), F32–F53.
- Berger, A. N., & Udell, G. F. (2006). A more complete conceptual framework for SME finance. *Journal of Banking & Finance*, 30, 2945–2966.
- Bird, G., & Rajan, R. S. (2002). Banks, financial liberalisation and financial crises in emerging markets. *The World Economy*, 24(7), 889–910.
- Boot, A. W. A. (2000). Relationship Banking: What Do We Know? *Journal of Financial Intermediation*, 9(1), 7–25.
- Bruno, V., & Hauswald, R. (2013). The Real Effect of Foreign Banks. *Review of Finance*, 18(5), 1683–1716.
- Carbo-Valverde, S., Humphrey, D., Maudos, J., & Molyneux, P. (2009). Cross-country comparisons of competition and pricing power in European banking. *Journal of International Money and Finance*, 28(1), 115–134.
- Claessens, S., & Van Horen, N. (2013). Foreign banks: Trends and impact. *Journal of Money, Credit, and Banking*, 46, 295–326.
- Claeys, S., & Hainz, C. (2006). *Acquisition versus Greenfield: The impact of the mode of foreign bank entry on information and bank lending rates*. European Central Bank.
- Clarke, G. R. G., Cull, R., & Peria, M. S. M. (2006). Foreign Bank Participation and Access to Credit across Firms in Developing Countries. *Journal of Comparative Economics*, 34(4), 774–795.
- Cull, R., & Peria, M. S. M. (2007). *Foreign Bank participation and crises in developing countries*, Vol. 4128. World Bank, Development Research Group, Finance and Private Sector Development Team.
- De Haas, R., & Naaborg, I. (2005). *Does foreign bank entry reduce small firms' access to credit? Evidence from European transition economies*. DNB Working Paper No.50 Amsterdam.
- De la Torre, A., Martinez Peria, M. S., & Schmukler, S. L. (2010). Bank involvement with SMEs: Beyond relationship lending. *Journal of Banking and Finance*, 34(9), 2280–2293.
- De Maeseineire, W., & Claeys, T. (2012). SMEs, foreign direct investment and financial constraints: The case of Belgium. *International Business Review*, 21(3), 408–424.
- Degryse, H., & Ongena, S. (2005). Distance, lending relationships, and competition. *The Journal of Finance*, 60(1), 231–266.
- Dell'Ariccia, G., & Marquez, R. (2001). Flight to Quality or to Captivity? Information and Credit Allocation. *Journal of Financial Economics*, 72, 185–214.
- Detragiache, E., Tressel, T., & Gupta, P. (2008). Foreign Banks in Poor Countries: Theory and Evidence. *The Journal of Finance*, 63(5), 2123–2160.
- Gopalan, S., & Rajan, R. S. (2017). Does foreign bank presence affect interest rate pass-through in emerging and developing economies? *Journal of Macroeconomics*, 54(B), 373–392.
- Gopalan, S., & Rajan, R. S. (2018). Foreign banks and financial inclusion in emerging and developing economies: An empirical investigation. *Journal of International Development*, 30(4), 559–583.
- Gormley, T. A. (2010). The impact of foreign bank entry in emerging markets: Evidence from India. *Journal of Financial Intermediation*, 19(1), 26–51.
- Kano, M., Uchida, H., Udell, G. F., & Watanabe, W. (2011). Information verifiability, bank organization, bank competition and bank–borrower relationships. *Journal of Banking & Finance*, 35(4), 935–954.
- Kim, H. E., & Lee, B. Y. (2004). *The Effects of Foreign Bank Entry on the Performance of Private Domestic Banks in Korea*, Working Paper. Institute of Monetary and Economic Research, the Bank of Korea.
- Kuntchev, V., Ramalho, R., Rodríguez-Meza, R., & Yang, J. S. (2012). *What Have We Learned from the Enterprise Surveys Regarding Access to Finance by SMEs?* Version: February 14, 2012.
- Leon, F. (2015). Does bank competition alleviate credit constraints in developing countries? *Journal of Banking & Finance*, 57(2015), 130–142.
- Mian, A. (2006). Distance constraints: the limits of foreign lending in poor economies. *Journal of Finance*, 61, 1465–1505.
- Petersen, M. A. (2004). *Information: Hard and Soft*. Northwestern University, Document De Travail.
- Petersen, M. A., & Rajan, R. G. (1995). The effect of credit market competition on lending relationships. *The Quarterly Journal of Economics*, 110(2), 407–443.
- Rajan, R. S., & Gopalan, S. (2015). How do foreign banks affect firms' access to credit?," Chapter 8. In R. S. Rajan, & S. Gopalan (Eds.). *Economic management in a volatile environment: Monetary and financial issues*. UK: Palgrave-Macmillan.
- Sapienza, P. (2002). The effects of banking mergers on loan contracts. *The Journal of Finance*, 57(1), 329–367.
- Sengupta, R. (2007). Foreign entry and bank competition. *Journal of Financial Economics*, 84(2), 502–528.
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393–410.
- Van Tassel, E., & Vishwasrao, S. (2007). Asymmetric information and the mode of entry in foreign credit markets. *Journal of Banking & Finance*, 31(12), 3742–3760.
- Van Leuvensteijn, M., Bikker, J. A., van Rixtel, A. A., & Sørensen, C. K. (2011). A new approach to measuring competition in the loan markets of the euro area. *Applied Economics*, 43(23), 3155–3167.
- World Bank (2018). *Bankers without borders. Global financial development report 2017/2018*. Washington, DC: World Bank.