## 1. Introduction

Financial inclusion broadly refers to access to the formal financial system. Access to financial services may help drive economic growth and is critical for emerging and developing economies. Financial inclusion facilitates investments in health, education, and businesses and also allows for consumption smoothing in the event of financial emergencies such as a job loss. While a growing body of research has pointed to the importance of financial inclusion, it is lacking in identifying the best methods for achieving financial inclusion. One possible mechanism is through financial globalization, particularly the entry of foreign banks. Foreign banks have established a significant presence in the banking systems of several developing and developed countries over the past three decades, which has prompted significant research on the effects of foreign banks on the economies of the countries that they enter. While the literature is replete with these studies, few studies examine the effects of foreign bank presence on financial access, particularly access to credit. My paper seeks to fill this void in the literature by examining the effect of an increase in foreign bank presence on access to credit, conditional on the presence of information sharing institutions such as credit bureaus..

In this paper, I contribute to the literature in two significant ways. First, I add to the literature that examines the relationship between foreign bank presence and financial access. I examine the differential impact of foreign bank presence with information sharing institutions by the inclusion of an interaction term between information sharing and foreign bank presence. Second, I employ a unique dataset that combines individual-level survey data taken from 76 emerging and developing economies with macroeconomic variables on foreign bank presence and information sharing institutions. This allows me to achieve several things. First, using micro-level data will control for borrower-level factors, such as income and age, that may also affect access to credit. Secondly, the survey responses used in my study allow me to examine the various dimensions of financial access, including access to different types of loans and the reliance on alternative forms of financing such as payday loans. Finally, the wide country coverage allows me to account for variation in economic development and other aspects of financial infrastructure that may also affect credit access in countries.

My findings are consistent with several empirical studies that examine the effect of foreign bank presence and information sharing on lending separately. Studies find that higher foreign bank presence is associated with reduced access to credit at the aggregate level (**???**). As it relates to information sharing, studies find that the exchange of information is associated with lower credit constraints (**???**). My study combines the two concepts and finds that while higher foreign bank presence is associated with a lower likelihood that an individual has a loan and increases reliance on informal lenders, information sharing offsets this effect.

The remainder of the study is organized as follows. Section 2 presents the theoretical rationale for my

analysis. Section 3 discusses the data construction and Section 4 describes the empirical model. Section 5 presents results, the discussion of findings and robustness tests. Section 6 concludes and draws policy implications.

## 2. Theoretical Considerations

### 2.1. Financial Access

An inclusive financial system, which facilitates access to a broad range of appropriate financial services, is likely to drive economic development. Access to the formal financial sector may facilitate investment in productive activities such as education or entrepreneurship. It may also allow consumption smoothing in the effect of transitory income shocks as a result of a job loss or crop failure (??). Without such access, individuals rely on their own savings which can contribute to income inequality and slower economic growth (?).

Financial inclusion is generally defined as access to formal financial services and may be measured as access to bank branches and ATMs per 100,000 persons. Financial exclusion, the antithesis of financial inclusion, may be a result of several factors. ? define financial exclusion as referring to those processes that serve to prevent certain social groups and individuals from gaining access to the formal financial system. ? have defined financial exclusion as broadly the inability (however occasioned) of some societal groups to access the financial system. According to ?, financial exclusion is a process that prevents poor and disadvantaged social groups from gaining access to the formal financial systems of their countries.

Financial exclusion may be categorized as either voluntary or involuntary. Voluntary financial exclusion may result from the lack of need for loans from banks. Involuntary financial exclusion may due to lack of physical access due to the distance from banks in major cities. It may also be due prohibitive costs or that there are barriers to their use, such as regulations requiring onerous paperwork, travel distance, legal hurdles, or other market failures. In this case, the banking sector is an important player in the reduction of involuntary financial exclusion.

The banking sector has also taken a lead role in promoting financial inclusion. The German Bankers' Association introduced a voluntary code in 1996 providing for an 'everyman' current banking account that facilitates basic banking transactions. In South Africa, a low cost bank account called 'Mzansi' was launched for financially excluded people in 2004 by the South African Banking Association. In India, the Reserve Bank of India (RBI) has initiated several measures to achieve greater financial inclusion such as facilitating 'no-frills' accounts and 'General Credit Cards' for low deposit and credit. Alternate financial institutions such as micro-finance institutions and 'Self-Help Groups' have also been promoted in some countries in order

to reach financial services to the excluded.

Much of the advancements in financial inclusion were facilitated by financial globalization with the entry of foreign banks and mobile technology (**??**). However, the effect of financial globalization has an ambiguous effect on access to credit. Financial access, to a certain extent requires a financially inclusive system, it does not necessarily imply access to credit. Many measures of financial inclusion exclude access to credit for certain segments of the population. As a result, these borrowers resort to borrowing from family, friends and predatory lenders such as payday lenders and moneylenders.

*2.2. Foreign Banks and Access to Credit*

Economic theory highlights the potential effectiveness of foreign banks at fulfilling the functions of a well-developed financial system. Foreign bank entrants tend to be large (**?**) and can achieve better economies of scale than domestic banks, particularly in developing countries with low capital-labor ratios. This, coupled with the increased competition, would result in lower costs of financial intermediation (**???**). Reducing barriers to foreign bank entry should therefore stimulate competition, increase access to capital markets and improve domestic financial policy and infrastructure (**????**).

On the other hand, economic theory also supports lower levels of credit in countries with higher levels of foreign bank presence. The size of many foreign banks can also result in a large geographical and cultural distance between loan officers and borrowers (**?**). The diseconomies of scale that arise from distance and size may lead foreign banks to be more reliant on "hard" information, such as credit scores and accounting statements. Foreign banks will therefore be more likely to engage in "cream-skimming," whereby "hard" information borrowers (the "cream") are separated from other borrowers ("skimming"). As a result, "soft" information borrowers find themselves in a worse remaining pool and will have to pay such high interest rates that they will be unable or unwilling to borrow (**??**).[1]

Other research finds that other factors may explain the ambiguity in findings on the effects of foreign bank presence on credit. Foreign banks may either enter by the acquisition of domestic banks ("brownfield" or "take-over" entry) or by the creation of new institutions ("greenfield" or "de novo" entry). The mode of entry may determine the effect of foreign bank entry on the market structure of the banking sector and the consequent behavior of foreign banks. The acquisition of domestic institutions may lead to an increase in market concentration, resulting in an oligopolistic market structure, while greenfield entry should increase the number of banks and result in an increase in competition. **?** finds that the mode of entry is an important determinant in the behavior of foreign banks, with greenfield banks achieving higher levels of efficiency than

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[1] "Soft" information is any information that is not easily quantifiable, such as borrower trustworthiness.

foreign banks that acquired domestic institutions. **?** find that greenfield banks are less likely to contract their credit base during a crisis period than "take-over" banks. Therefore, the effect of foreign bank entry on the market structure may determine the resultant effect on access to credit.

*2.3. Information Sharing and Access to Credit*

One factor that has not been explored in detail in the literature on foreign banks is the effect of information sharing institutions. When an individual applies for a loan, the bank may either rely solely on the relevant information on the applicant's credit history directly or supplement this information with data from other lenders who have already dealt with the applicant. This exchange of information between lenders can occur voluntarily through private credit bureaus or be enforced via public credit registries. The existence of information sharing institutions should alleviate adverse selection by allowing loans to be extended to creditworthy borrowers who had previously been priced out of the market, resulting in higher levels of aggregate lending (**??**). These institutions may also counter moral hazard by encouraging borrowers to build "reputational collateral" by increasing the borrowers' cost of defaulting, thus increasing the likelihood of debt repayment (**??**) and reducing reliance on tangible collateral (**?**). The sharing of credit-related information also reduces the information monopoly a lender has on its borrowers. Banks with long-standing relationships with their clients know the credit history of those borrowers, while other lenders may not have access to this information. This information monopoly, which may be more common in oligopolistic market structures, allows the bank to charge higher interest rates to these high-quality borrowers (**?**). Information sharing institutions should therefore eliminate this information monopoly by creating incentives for lenders to report their experiences with borrowers in order to gain access to other creditors' data in the future. Economic theory and empirical evidence therefore imply that the existence of information sharing institutions may reduce the costs and increase the availability of credit.

Information sharing may be of particular importance in countries with high levels of foreign bank presence. The geographical and cultural distance between borrowers and loan officers in foreign banks make hard information, such as credit histories, more important. Additionally, foreign banks often have parent companies based in developed countries and are therefore familiar with the benefits of credit scoring often found in their home countries. Therefore, a foreign bank may be more willing to lend in countries with a well-developed information sharing infrastructure. In the absence of information exchange, cream-skimming by foreign banks may lead to higher levels of inefficiency (**?**). Also, the absence of a credit bureau or credit registry may prevent the efficient identification of good credit risks and make borrowers more reliant on informal sources. These informal sources, such as moneylenders may charge high interest rates and use tactics such as violence to ensure repayment.

Conversely, in countries with high foreign bank presence information exchange may not result in higher aggregate levels of lending. Much of the information is typically "soft" and is collected by lenders over time through relationships with these individuals. This "relationship banking" has been found to be best done by small, local banks (**?**). Foreign banks, on the other hand, have a comparative disadvantage at relationship banking due to their size and the distance of borrowers from loan officers. This may lead these foreign banks to focus their lending on large, established individuals or funding government deficits. Therefore, information sharing institutions in countries with high foreign bank presence may allow easier (but not perfect) identification of lower credit risks and reduce non-performing loans, however, at the aggregate level this may not lead to an increase in the level of credit. Instead there may simply be an increase in "cherry-picking", with the reallocation of credit towards "high-quality" borrowers.

## 3. Data Construction

To measure the effect of foreign bank presence and information sharing on access to credit, I combine several databases. To measure financial access, I use the World Bank Findex. Indicators in the Global Findex are drawn from survey data covering approximately 150,000 individuals in each survey year in over 140 economies. The database includes indicators that measure how adults around the world save, borrow, make payments, and manage risk. Surveys are published every three years, so I use the 2011, 2014 and 2017 databases.[2] For the purpose of examining household access to credit, I primarily use survey responses on individuals' borrowing activities. To measure the level of foreign bank presence, I use a database compiled by **?** on ownership data for all commercial banks as identified in Bankscope. For each bank, the dataset includes its ownership (foreign or domestic) and, if foreign owned, the home country of the majority of shareholders. I use this data to create the variable $foreign_{ct}$, which measures the country level of foreign bank presence. Country-level data on information sharing institutions are obtained from the World Bank's Credit Reporting Database. This database, compiled for the 2013 Global Financial Development Report, presents data on the existence and ownership structure of credit reporting institutions. Macroeconomic data are obtained from the World Bank's Global Financial Development Database (GFDD) and financial infrastructure indicators are taken from the World Bank's Doing Business database. [3]

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[2]I only include countries which have survey responses for all three years. The countries included in the study are listed in Appendix Table A1.

[3]It is also noted that there was a change in the methodology used in the calculation of several sub-indices on the Doing Business Index in 2015, making comparison across time difficult

*3.1. Individual Characteristics*

To measure the effect of foreign bank presence and information sharing institutions on financial access, I create several dependent variables, each representing a different dimensions of access to credit. Financial inclusion at its most basic level, starts with having a bank account. I therefore exclude all individuals who do not have a bank account. This may imply involuntary financial exclusion due possibly to distance from a financial institution. I then create $anyloan_{ict}$ which takes the value of 1 if the individual surveyed reported having received any type of loan from a financial institution. I also create the following dummy variables to capture differential impact on various types of loans from the financial sector; $creditcard_{ict}$ and $mortgage_{ict}$. Additionally, I include a variable to account for borrowing outside of the formal financial sector, $familyloan_{ict}$ if the respondent reported receiving a loan from family or friends and $privloan_{ict}$ if the individual reported receiving an loan from another lender such as loan shark, payday lender, or pawn shop. Together, these two variables make up $infloan_{ict}$, which measure individuals who have received some form of informal loan. This variable should capture need for external credit that is not met by the formal financial sector. Detailed descriptions of the dependent variables for my analysis of consumer lending are presented in Appendix Table A2.

Table 1 presents the summary statistics on the variables used to analyze consumer lending. 14 percent of the sample report receiving any type of loan from a financial institution. The majority of loans from financial institutions are credit cards with 12.0 percent of the sample reporting having this type of loan. Individuals receiving mortgages are less prevalent, accounting for 4 percent of the survey respondents in my sample. Informal lending sources are widely used, by 26 percent of respondents, primarily from family or friends. To control for individual level characteristics that may affect an individual's access to credit, I include individual level characteristics for gender, age, income and education level. The sample is slightly skewed towards the female gender with an average respondent age of 39 years. Income is measured as the individual's within-economy income quintile and education level is also measured using an index ranging from 1 to 3 (1 = completed primary or less, 2= secondary, 3= completed tertiary or more). The average respondent has a maximum education at the primary level. It is expected that credit usage should be higher for older, more educated individuals with higher levels of income. The effect of gender on the likelihood that an individual has a loan is a priori ambiguous and may be dependent on country cultural norms.

*3.2. Foreign Bank Presence and Information Sharing Variables*

Relating the individual characteristics to country level variables, the average individual surveyed lived in a country with a percentage of foreign banks assets out of total banks of 40 percent. On average, foreign banks make up 40 percent of the number of banks. The majority of respondents, 88 percent, lived in countries with

**Table 1.** Summary statistics

| Variable | Obs | Mean | Std.Dev | Min | Max |
|---|---|---|---|---|---|
| *Panel A: Individual Characteristics* | | | | | |
| Female (yes=1) | 54736 | 0.54 | 0.50 | 0.00 | 1.00 |
| Age (years) | 54736 | 39.04 | 16.83 | 15.00 | 99.00 |
| Educational attainment* | 54736 | 1.80 | 0.68 | 1.00 | 5.00 |
| Within-economy income quintile** | 54736 | 3.20 | 1.41 | 1.00 | 5.00 |
| | | | | | |
| *Panel B: Financial Access Variables* | | | | | |
| Has any type of loan from a formal financial institution | 54736 | 0.14 | 0.35 | 0.00 | 1.00 |
| Has credit card | 54736 | 0.12 | 0.32 | 0.00 | 1.00 |
| Has mortgage | 54736 | 0.05 | 0.21 | 0.00 | 1.00 |
| Has informal loan | 54736 | 0.26 | 0.44 | 0.00 | 1.00 |
| Has loan from family or friends | 54736 | 0.24 | 0.43 | 0.00 | 1.00 |
| Has loan from private lender (moneylender, payday lender, etc.) | 54736 | 0.04 | 0.20 | 0.00 | 1.00 |
| | | | | | |
| *Panel C: Foreign Bank Presence Variables* | | | | | |
| Foreign bank (assets) | 54736 | 0.41 | 0.31 | 0.00 | 0.99 |
| Foreign banks (number) | 54736 | 0.47 | 0.25 | 0.00 | 0.94 |
| | | | | | |
| *Panel D: Information Sharing Variables* | | | | | |
| Depth of Credit Information | 54736 | 3.66 | 2.48 | 0.00 | 6.00 |
| Either CB or CR | 54736 | 0.87 | 0.33 | 0.00 | 1.00 |
| Both CB and CR | 54736 | 0.34 | 0.47 | 0.00 | 1.00 |
| Credit bureau | 54736 | 0.65 | 0.48 | 0.00 | 1.00 |
| Credit bureau (only) | 54736 | 0.31 | 0.46 | 0.00 | 1.00 |
| Credit registry | 54736 | 0.57 | 0.50 | 0.00 | 1.00 |
| Credit registry(only) | 54736 | 0.23 | 0.42 | 0.00 | 1.00 |
| | | | | | |
| *Panel E: Macroeconomic Control Variables* | | | | | |
| Real GDP per capita (3-year average, log) | 54736 | 9.52 | 1.12 | 6.58 | 12.22 |
| Inflation (annual average) | 54736 | 0.06 | 0.08 | -0.01 | 0.52 |
| Strength of legal rights index (0=weak to 12=strong) | 54736 | 5.07 | 2.46 | 0.00 | 10.00 |
| NPL/loans | 54736 | 7.12 | 6.91 | 1.40 | 39.20 |

\* 1 = completed primary or less, 2= secondary, 3= completed tertiary or more
\*\* 1= poorest 20 percent 2= second 20 percent 3= middle 20 percent 4= fourth 20 percent 5= richest 20 percent -

some form of information sharing institution. 63 percent lived in countries with credit bureaus, 58 percent in countries with credit registries and 33 percent lived in countries with both types of information sharing institutions.

The average respondent in my sample operates in a country where foreign banks account for 41 percent of the total number of banks and foreign bank assets make up 47 percent of total bank assets (Panel C of Table 1). 87 percent of the respondents surveyed operate in a country that had either a credit bureau or a credit bureau during the survey year (Panel D of Table 1). 65 percent of the individuals have operations in countries with a credit bureau, while 57 percent operate in a country that has a credit registry. 34 percent of the individuals in my sample operate in a country that had both a credit bureau and a credit registry. My primary measure of the level of information sharing is the depth of credit information index from the World Bank Doing Business database. This index measures rules and practices affecting the coverage, scope and

accessibility of credit information available through either a credit bureau or a credit registry. The index ranges from 0 to 8, with higher values indicating the availability of more credit information, from either a credit bureau or a credit registry, to facilitate lending decisions. The index ranged from 0 to 6 for my sample, with an average value of 3.63.

Given the moderate correlation between my primary variables of interest (Table 2), foreign bank presence and information sharing, I check if the estimates suffer from multicollinearity. It is possible that foreign banks may be more likely to enter countries with information infrastructure that has already been developed. Therefore, foreign bank entry would increase following the establishment of an information sharing institution. On the other hand, significant foreign bank entry may precede the creation of information infrastructure. **?** posits that foreign bank entry may encourage the development of financial infrastructure. However, for my sample, there is no evidence that foreign bank entry generally follows or encourages the creation of credit bureaus or credit registries.[4]

### 3.3. Macroeconomic Indicators and Financial Infrastructure

I include several country-level control variables to account for macroeconomic factors that may affect an individual's access to credit. I include the log of the three-year average of per capita real GDP to control for differing levels of economic development. I also include the annual average inflation rate, consistent with current literature which finds that inflation is associated with reduced bank lending activity (**??**). To capture other elements of the financial infrastructure that may affect lending, I include the strength of legal rights index from the World Bank's Doing Business Index, which measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders. Studies have found that a higher level of creditor rights will improve the role of financial intermediation (**?**). The index ranges from 0 to 12, with an approximate average value of 5.07 for my sample. However, the impact on access to financing from financial institutions is a priori ambiguous since improved creditor rights may aid in the overall functioning of the financial sector but may also reduce reliance on financial institutions by encouraging the development of alternative sources of financing (**?**).

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[4]Appendix Figure A1 shows that there is no correlation between increases in the three-year average growth rate of the numbers of foreign banks before or after the creation of information sharing institutions for my sample. Variance inflation factor tests for collinearity imply that this is not the case and justify the inclusion of both of these variables in my analysis. Results are not included. These tests indicate that there is a low chance of collinearity between my two primary variables of interest.

**Table 2.** Correlations

| | Foreign bank (assets) | Depth of Credit Information | Depth of Credit Information |
|---|---|---|---|
| Foreign banks (number) | 0.855*** | | |
| Depth of Credit Information | -0.0762*** | | |
| Credit bureau | 0.0258*** | 0.463*** | |
| Credit registry | 0.00236 | 0.357*** | 0.357*** |
| Real GDP per capita | -0.254*** | 0.494*** | 0.494*** |
| Inflation | -0.0556*** | 0.00494 | 0.00494 |
| NPL/loans | 0.283*** | -0.225*** | -0.225*** |
| Strength of legal rights index | 0.392*** | -0.0657*** | -0.0657*** |

Notes: The data are at the country-level. The symbols *, **, *** denotes statistical significance at the 10%, 5% and 1% level respectively.

## 4. Empirical Model

Given the binary nature of our dependent variables, a binary model is more suitable than a linear model. To examine how different levels of foreign bank presence and information sharing infrastructure affect access to credit we estimate a probit regression of the following form:[5]

$$Prob(access_{ict}) = \Phi(\beta_0 + \beta_1 foreign_{ct} + \beta_2 infodepth_{ct} + \gamma F_{ict} + \lambda M_{ct} + \epsilon_{ict}), \qquad (1)$$

where the subscript $i$ indexes individuals, $c$ indexes countries and $t$ indexes years. $\Phi$ is the standard normal cumulative distribution. $access_{ict}$ is measured in several ways. I first define $access_{ict}$ as $anyloan_{ict}$, an indicator that take the value of one if an individual reports having received a loan from a financial institution and zero otherwise. I then examine the effects on $creditcard_{ict}$ and $mortgage_{ict}$. Additionally, I include a variable for lack of access which accounts for borrowing outside of the formal financial sector, $infloan_{ict}$ if the individual reported receiving an informal loan (from a payday lender or loan shark). $foreign_{ct}$ is the level of foreign bank presence in the country in which the individual operates and $infodepth_{ct}$ is the value of the depth of credit information index in year t. $I_{ict}$ is a vector of individual-level characteristics, such as gender, age, income and education level and $M_{ct}$ is a matrix of country-level macroeconomic and institutional variables. The inclusion of these variables should control for factors that may also affect an individual's access to credit.[6]

To identify the differential effect of information sharing with varying levels of foreign bank presence, I

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[5]We also estimate a linear probability model and obtain results with similar statistical and economical significance to those obtained using probit

[6]I also include fixed effects at the region level rather than the country level as there was a high level of collinearity between country fixed effects and other independent variables

include an interaction of $foreign_{ct}$ and $infodepth_{ct}$ in 1 as follows:-

$$Prob(access_{ict}) = \Phi(\beta_0 + \beta_1 foreign_{ct} + \beta_2 infodepth_{ct} + \beta_3 foreign_{ct} \times infodepth_{ct} + \gamma I_{ict} + \lambda M_{ct} + \epsilon_{ict}), \quad (2)$$

A significant coefficient indicates that the effect of information sharing varies with the level of foreign bank presence. This would indicate the importance of information sharing institutions in countries with higher levels of foreign bank presence.

## 5. Results

### 5.1. The Effect of Foreign Bank Presence and Information Sharing on the Probability that an Individual receives a Loan from a Financial Institution

To examine the effect of foreign bank presence and information sharing on the probability that an individual receives a loan from a formal financial institution, I estimate three baseline models. The first excludes all control variables. The second incorporates macroeconomic variables and the third includes both macroeconomic indicators and individual characteristics. Table 3 presents results. In the absence of control variables (column (1)), foreign bank presence has a negative, statistically significant effect on the likelihood that an individual receives a loan. Information sharing is found to have a positive effect. With the inclusion of macroeconomic variables (column (2)), the effect of foreign bank presence remains negative. The negative sign is consistent with the findings of ?, who find that an increase in foreign bank presence is associated with a decrease in aggregate private credit to the private sector. The effect of the existence of an information sharing institution remains positive, statistically and economically significant. With the exception of the non-performing loans, the macroeconomic control variables are of the expected signs. For instance, higher levels of GDP, indicative of higher economic development, are positively correlated with a higher likelihood that an individual had a loan. Stronger legal rights increase the probability that an individual used external financing from a financial institution.

For the model including both macroeconomic variables and individual characteristics (column (3)), many of the individual attribute control variables, being female reduces the probability of having any type of loan, while the likelihood increases with age, educational level and income level. More importantly, an increase in foreign banks' asset share reduces the likelihood that an individual receives a loan. Increased availability of more credit information, from either a credit bureau or a credit registry, increases the likelihood that an individual had formal loan.

To examine the differential effect of the information sharing institution at varying levels of foreign bank presence, I include the interaction variable $foreign_{ct} \times infodepth_{ct}$ using the model specification given in

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equation 2. This interaction variable is found to be positive and economically significant (column (4) of Table 3), indicating that information sharing partially offsets the negative effect of increasing foreign bank presence on access to credit.

**Table 3.** Baseline regressions - Individual received a Loan from a Formal Institution

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Foreign banks (assets) | -0.387*** | -0.102** | -0.165*** | -0.283*** |
| | (0.031) | (0.041) | (0.045) | (0.076) |
| Depth of Information | 0.076*** | 0.016*** | 0.013** | 0.003 |
| | (0.005) | (0.006) | (0.006) | (0.008) |
| Foreign banks * Depth of Information | | | | 0.031** |
| | | | | (0.015) |
| *Macroeconomic Controls* | | | | |
| Real GDP per capita | | 0.493*** | 0.491*** | 0.494*** |
| | | (0.012) | (0.012) | (0.013) |
| Inflation | | -0.034 | -0.270** | -0.275** |
| | | (0.124) | (0.129) | (0.129) |
| Strength of legal rights index | | 0.014** | 0.020*** | 0.020*** |
| | | (0.005) | (0.006) | (0.006) |
| NPL/loans | | 0.019*** | 0.015*** | 0.013*** |
| | | (0.003) | (0.003) | (0.003) |
| *Individual Characteristics* | | | | |
| Female | | | -0.213*** | -0.213*** |
| | | | (0.016) | (0.016) |
| Age (years) | | | 0.001** | 0.001** |
| | | | (0.000) | (0.000) |
| Education | | | 0.412*** | 0.412*** |
| | | | (0.013) | (0.013) |
| Income (within economy quintile) | | | 0.147*** | 0.147*** |
| | | | (0.006) | (0.006) |
| Constant | -1.703*** | -6.184*** | -7.203*** | -7.166*** |
| | (0.061) | (0.131) | (0.141) | (0.143) |
| Observations | 55084 | 48412 | 48412 | 48412 |
| Pseudo $R^2$ | 0.060 | 0.104 | 0.169 | 0.169 |

Notes: This table reports probit regression coefficients and robust standard errors (in parentheses). The dependent variable is $anyloan_{ict}$, which is a dummy variable that takes the value of 1 if the individual reported receiving a loan by a formal financial institution. $foreign_{ct}$ is defined as foreign bank assets out the total bank assets. $infodepth_{ct}$ is the depth of credit information index, which measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry. The symbols *, **, *** denotes statistical significance at the 10%, 5% and 1% level respectively. -

*5.2. The Effect of Foreign Bank Presence and Information Sharing on the Probability that an Individual receives a Particular Type of Loan (Credit Card or Mortgage) from a Financial Institution*

Information sharing and foreign banks may also have differential impacts on different types of loans. Credit scores, obtained through credit bureaus, may be more likely to be used for the approval of credit cards, while credit registries may be more relevant for larger loans such as mortgages. Also, foreign banks may have less participation in mortgage lending markets which are typically heavily subsidized by governments. To estimate the effect of foreign bank presence and information sharing on interest rates, I re-define the dependent variable as $creditcard_{ict}$ and $mortgage_{ict}$. Results are presented in Table 4.

**Table 4.** Baseline regressions - Individual has a Credit Card or a Mortgage

|  | Credit Cards | Mortgages |
|---|---|---|
| Foreign banks (assets) | -0.158*** | -0.414*** |
|  | (0.009) | (0.100) |
| Depth of Information | 0.012*** | 0.008 |
|  | (0.002) | (0.010) |
| Foreign banks * Depth of Information | 0.025*** | 0.002 |
|  | (0.007) | (0.021) |
| *Individual Characteristics* |  |  |
| Female | -0.216*** | -0.180*** |
|  | (0.017) | (0.022) |
| Age (years) | 0.001*** | -0.001*** |
|  | (0.001) | (0.001) |
| Education | 0.454*** | 0.235*** |
|  | (0.014) | (0.017) |
| Income (within economy quintile) | 0.164*** | 0.067*** |
|  | (0.007) | (0.008) |
| *Macroeconomic Controls* |  |  |
| Real GDP per capita | 0.516*** | 0.335*** |
|  | (0.014) | (0.019) |
| Inflation | -0.620*** | 0.326* |
|  | (0.148) | (0.175) |
| Strength of legal rights index | 0.010 | 0.030*** |
|  | (0.006) | (0.008) |
| NPL/loans | 0.013*** | 0.008** |
|  | (0.003) | (0.004) |
| Constant | -7.639*** | -5.991*** |
|  | (0.157) | (0.220) |
| Observations | 48412 | 48412 |
| Pseudo $R^2$ | 0.203 | 0.103 |

Notes: This table reports probit regression coefficients and robust standard errors (in parentheses). The dependent variable $creditcard_{ict}$ is a dummy variable that takes the value of 1 if the individual reported having a credit card. The dependent variable $mortgage_{ict}$ is a dummy variable that takes the value of 1 if the individual reported having a mortgage. $foreign_{ct}$ is defined as foreign bank assets out the total bank assets. $infodepth_{ct}$ is the depth of credit information index, which measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry. The symbols *, **, *** denotes statistical significance at the 10%, 5% and 1% level respectively.  -

Many of the signs of the individual and macroeconomic control variables are consistent with a priori expectations. The coefficient on age is negative for the regressions with mortgage, which is consistent with

the expectation that younger individuals would be more likely to seek mortgages. The marginal effect of individual income is largest on credit cards, indicating that individuals with higher income were more likely to have credit cards. At both the macroeconomic (GDP per capita) and individual level (within-economy income quintile), higher income is also associated a lower likelihood of an individual having a mortgage. An increase in foreign bank presence has a negative marginal effect on each type of loan. However, information sharing has a positive effect on the likelihood of receiving a credit card. The effect on mortgages is not statistically significant. This may be attributed to the fact that credit scores, generated by credit bureaus are a significant factor in the approval for a credit card. On the other had there is limited involvement of private entities in the mortgage markets in developing countries (**?**), which are typically heavily subsidized by the government.

*5.3. The Effect of Foreign Bank Presence and Information Sharing on the Probability that an Individual has a Loan from Informal Sources*

Reduced access to credit may lead borrowers to resort to alternative sources of financing such as payday lenders and loan sharks. To examine how foreign bank and information sharing institutions affect informal lending, I repeat the probit regressions with $infloan_{ict}$, a dummy variable that takes the value of one if the individual reported receiving a loan from an informal source, such as a family member ($familyloan_{ict}$) or payday lender or loan shark ($privloan_{ict}$). Average marginal effects are presented in Table 5. Higher non-performing loans at the country level are associated with an increased likelihood that an individual borrowed from a loan shark or a payday lender. A well-developed system of legal rights reduces the probability that an individual borrowed from a lender outside of the formal financial sector. Foreign bank presence increases the likelihood that an individual borrowed money from a family member or friend as well as private lender such as a payday lender or pawn shop. This result is consistent with findings by **?** who discovered that these types of lenders tended to arise in countries/areas with limited financial access. High foreign bank presence may reduce access for informationally opaque individual borrowers and may increase the reliance on this type of lender. Information sharing increases the probability that the individual surveyed borrowed from an informal lender partially offsetting the effect of foreign bank presence.

**Table 5.** Baseline regressions - Individual received a Loan from Informal Sources

| | Informal Loans | Family Loans | Informal Private Lenders |
|---|---|---|---|
| Foreign banks (assets) | 0.155*** | 0.211*** | 0.130*** |
| | (0.045) | (0.045) | (0.074) |
| Depth of Information | -0.051*** | -0.045*** | -0.070*** |
| | (0.006) | (0.006) | (0.010) |
| Foreign banks * Depth of Information | -0.071*** | -0.087*** | -0.045*** |
| | (0.011) | (0.011) | (0.017) |
| *Individual Characteristics* | | | |
| | | | |
| Female | -0.078*** | -0.075*** | -0.084*** |
| | (0.013) | (0.013) | (0.021) |
| Age (years) | -0.005*** | -0.005*** | -0.001 |
| | (0.000) | (0.000) | (0.001) |
| Education | 0.010 | 0.015 | -0.007 |
| | (0.011) | (0.011) | (0.018) |
| Income (within economy quintile) | -0.043*** | -0.045*** | -0.008 |
| | (0.005) | (0.005) | (0.008) |
| *Macroeconomic Controls* | | | |
| | | | |
| Real GDP per capita | -0.109*** | -0.102*** | -0.038** |
| | (0.010) | (0.011) | (0.017) |
| Inflation | 1.411*** | 1.549*** | -0.364* |
| | (0.103) | (0.104) | (0.215) |
| Strength of legal rights index | -0.038*** | -0.042*** | -0.012* |
| | (0.004) | (0.004) | (0.007) |
| NPL/loans | 0.012*** | 0.013*** | 0.012*** |
| | (0.002) | (0.002) | (0.003) |
| Constant | 0.761*** | 0.346*** | -0.252 |
| | (0.111) | (0.114) | (0.168) |
| Observations | 48412 | 48412 | 48412 |
| Pseudo $R^2$ | 0.064 | 0.069 | 0.040 |

Notes: This table reports probit regression coefficients and robust standard errors (in parentheses). The dependent variable is $familyloan_{ict}$, which is a dummy variable that takes the value of 1 if the individual receiving an informal loan from family, friends or another private lender, such as a payday lender. $foreign_{ct}$ is defined as foreign bank assets out the total bank assets. $infodepth_{ct}$ is the depth of credit information index, which measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry. The symbols *, **, *** denotes statistical significance at the 10%, 5% and 1% level respectively.

*5.4. Robustness Tests*

In this section, I test the robustness of the regression results. First, I test to see whether the results are sensitive to the definition of the variables of interest, $foreign_{ct}$ and $infodepth_{ct}$. Foreign bank presence may be alternately measured as the number of foreign banks as a percentage of the total number of banks. The number of foreign banks may be more relevant as a measure of competition.[7] I re-estimate the model using the percentage of foreign banks out of the total number of banks as the measure of foreign bank presence. The re-definition of foreign bank presence gives results similar in magnitude and statistical significance as the previous definition (column (2) of Table 6). This result is expected due to the high correlation between the number of foreign banks and the assets held by foreign banks.

The mere existence of an information sharing institution may be as important as the level of participation by both creditors and borrowers. To test this, I re-define $infodepth_{ct}$ as $infoshar_{ct}$ a dummy variable that captures the existence of an information sharing institution, either a credit bureau or credit registry. This variable should capture whether the presence of an information sharing institution has an effect on household access to credit. Consistent with earlier findings, the existence of an information sharing institution has a positive effect on the likelihood that an individual has a loan (column (3) of Table 6).

Foreign bank entry could lead to either an increase or decrease in competition depending on the method of entry. **?** find that foreign banks increase competition provided that there is "de novo penetration". Therefore, while greenfield entry may increase competition, entry through mergers or acquisitions of domestic banks may reduce the level of competition, raising interest rates and reducing access to credit(**?**). To test if the negative effect of foreign bank presence comes from the impact on market structure, I incorporate a variable for bank concentration obtained from the World Bank's Global Financial Development Database. This measure is defined as the assets of the three largest commercial banks as a share of total commercial banking assets. A higher value implies a more oligopolistic banking sector. I create a dummy variable, $oligopoly_{ct}$, that takes the value of one if bank concentration is greater than 50 percent, which I interact with the foreign bank and information sharing variables (column (4) of Table 6). Information exchange offsets the negative effect of higher foreign bank presence in an oligopolistic banking sector, increasing the probability that an individual has a loan. This implies that in a banking sector where foreign bank entry through merger and acquisition leads to an oligopolistic structure, information sharing should increase access to credit.

Many of the country-level macroeconomic variables are correlated with correlated with foreign bank presence (Table 2). This brings up the problem of endogeneity. It is plausible that foreign bank presence has an effect on access to bank credit. However, it is also plausible that foreign banks self-select themselves into

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[7]Several studies (**??**) use the number of foreign banks as a measure of foreign bank presence.

**Table 6.** Robustness Test 1

| | Baseline Model | Number of Foreign Banks | Existence of Information Sharing Institution | Market Structure |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Foreign banks (assets) | -0.283*** | | -2.076*** | -0.299*** |
| | (0.076) | | (0.234) | (0.003) |
| Foreign banks (number of banks) | | -0.142*** | | |
| | | (0.048) | | |
| Depth of Credit Information | 0.003 | 0.005 | | 0.055*** |
| | (0.008) | (0.010) | | (0.016) |
| Foreign bank (assets) * Info depth | 0.031** | | | 0.006 |
| | (0.015) | | | (0.039) |
| Foreign banks (number) * Info depth | | 0.038** | | |
| | | (0.018) | | |
| Information sharing | | | 0.808*** | |
| | | | (0.074) | |
| Foreign bank (assets) * Information sharing | | | 2.277*** | |
| | | | (0.230) | |
| Oligopoly | | | | -0.506*** |
| | | | | (0.088) |
| Oligopoly * Foreign banks (assets) | | | | -0.286 |
| | | | | (0.189) |
| Oligopoly * Info depth | | | | 0.099*** |
| | | | | (0.018) |
| Oligopoly * Foreign banks (assets) * Info depth | | | | 0.096** |
| | | | | (0.038) |
| Constant | -7.166*** | -7.714*** | -8.572*** | -7.516*** |
| | (0.143) | (0.127) | (0.196) | (0.158) |
| Observations | 48412 | 51365 | 48412 | 48412 |
| Pseudo $R^2$ | 0.169 | 0.191 | 0.171 | 0.171 |

Notes: This table reports probit regression coefficients and robust standard errors (in parentheses). The dependent variable is $anyloan_{ict}$, which is a dummy variable that takes the value of 1 if the individual reported receiving a loan by a formal financial institution. $foreign_{ct}$ is re-defined as the number of foreign banks out the total number of banks. $infodepth_{ct}$ is the depth of credit information index, which measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry. $infoshar_{ct}$ is a dummy variable that takes the value of 1 if there is either a credit bureau or credit registry in existence. We create a dummy variable, $oligopoly_{ct}$, that takes the value of one if the assets of the three largest commercial banks as a share of total commercial banking assets is greater than 50 percent. A higher value implies a more oligopolistic banking sector. The symbols *, **, *** denotes statistical significance at the 10%, 5% and 1% level respectively.

developing countries based on their level of financial development as, in part, measured by access to credit. To account for this, I estimate a model of the probability or extent of foreign bank presence in an economy based on its observed characteristics and use the residuals from this model as a measure of "unexpected" foreign bank presence that nets out the effect of developing country banking sector characteristics on foreign banks. Results are presented in Table 7. I find that unexpected foreign bank presence has an economically and statistically significant negative effect on the probability that an individual has a loan. It also increases reliance of informal loans. Information sharing partially offsets these effects.

**Table 7.** Robustness Test 2 - Unexpected Foreign Bank Presence

| | (1) | (2) |
|---|---|---|
| | Any Loan | Informal Loans |
| Foreign bank (FB) presence (unexpected) | -0.335*** | 0.162*** |
| | (0.077) | (0.045) |
| Depth of Information | 0.044*** | -0.118*** |
| | (0.012) | (0.008) |
| Foreign bank (FB) presence (unexpected) × Depth of Credit Information | 0.048*** | -0.067*** |
| | (0.016) | (0.011) |
| *Individual Characteristics* | | |
| Female | -0.213*** | -0.078*** |
| | (0.016) | (0.013) |
| Age (years) | 0.001** | -0.005*** |
| | (0.000) | (0.000) |
| Education | 0.412*** | 0.009 |
| | (0.013) | (0.011) |
| Income (within economy quintile) | 0.147*** | -0.043*** |
| | (0.006) | (0.005) |
| *Macroeconomic Controls* | | |
| Real GDP per capita | 0.498*** | -0.106*** |
| | (0.012) | (0.010) |
| Inflation | -0.287** | 1.393*** |
| | (0.131) | (0.104) |
| Strength of legal rights index | -0.021*** | 0.036*** |
| | (0.005) | (0.004) |
| NPL/loans | 0.012*** | 0.012*** |
| | (0.003) | (0.002) |
| Constant | -7.493*** | 0.916*** |
| | (0.151) | (0.113) |
| Observations | 48412 | 48412 |
| Pseudo $R^2$ | 0.169 | 0.064 |

Notes: This table reports probit regression coefficients and robust standard errors (in parentheses). The dependent variable is $anyloan_{ict}$, which is a dummy variable that takes the value of 1 if the individual reported receiving a loan by a formal financial institution. $foreign_{ct}$ is re-defined as "unexpected" foreign bank presence. $infodepth_{ct}$ is the depth of credit information index, which measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry. The symbols *, **, *** denotes statistical significance at the 10%, 5% and 1% level respectively.  -

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## 6. Conclusion

The analysis in this paper makes a contribution to the literature in two ways. First, the study investigates the impact of information sharing institutions on access to credit in countries with varying levels of foreign bank presence. This is achieved by the use of micro-level data to control for borrower characteristics that may also affect access and use of credit. Second, the study extends the empirical literature on foreign banks by examining the role of information exchange on . The analysis in this study generates robust results and should be informative for policy formulation. Using probit regression analysis, controlling for individual-level characteristics, I find that an increase in the percentage of foreign bank assets out of total bank assets reduces the probability of an individual having a loan. This effect is present for various types of consumer loans, including credit cards and mortgages. This implies that foreign bank entry may typically occur through the acquisition of domestic institutions. The consequent change of the banking market to an oligopolistic structure has a negative effect on access to credit. This finding is also consistent with the conclusions of several papers that examine aggregate measures of credit and find a negative association between foreign bank presence and private sector credit. Higher foreign bank presence is also associated with increased usage of informal lending sources at the individual level due possibly to reduced access to credit through formal financial institutions. However, information sharing institutions is found to have a significant effect on credit usage and access with substantial variation in the effect of information exchange at different levels of foreign bank presence. For example, information exchange has a positive effect of on the likelihood that an individual has any type of loan at levels of foreign bank presence above 30 percent. This result is consistent with the hypothesis of ?, who find that banks are more willing to share information in more concentrated markets, increasing the effectiveness of information sharing institutions. The effect of information sharing is positive for consumer lending at higher levels of foreign bank presence, which implies that an oligopolistic (greater than 50 percent foreign banks) banking sector may be beneficial for consumer lending.

My findings suggest that information sharing is important for access to credit. Governments should encourage the creation of information sharing institutions and improvement of existing information infrastructure in economies with higher levels of foreign bank presence. However, policymakers should be aware of the differential effect of these institutions particularly at high levels of foreign bank presence, due to the nature of information sharing and possible market structure and take these factors into account in encouraging the creation of information sharing institutions.

# Appendices

**Appendix A. Appendix Tables**

Table A1: Sample Countries

| Country | Year | | | Country | Year | | |
|---|---|---|---|---|---|---|---|
| | *2011* | *2014* | *2017* | | *2011* | *2014* | *2017* |
| Afghanistan | 966 | 959 | 992 | Lithuania | 949 | 963 | 894 |
| Albania | 944 | 988 | 988 | Macedonia, FYR | 793 | 967 | 996 |
| Algeria | 998 | 998 | 960 | Madagascar | 1000 | 1002 | 987 |
| Argentina | 990 | 985 | 974 | Malawi | 1000 | 996 | 965 |
| Armenia | 989 | 1000 | 953 | Malaysia | 941 | 975 | 987 |
| Azerbaijan | 948 | 979 | 971 | Mali | 998 | 982 | 976 |
| Bahrain | 874 | 989 | 1050 | Malta | 989 | 997 | 999 |
| Bangladesh | 916 | 972 | 985 | Mauritania | 988 | 982 | 904 |
| Belarus | 979 | 1010 | 1017 | Mauritius | 982 | 985 | 991 |
| Benin | 997 | 979 | 973 | Moldova | 964 | 981 | 906 |
| Bolivia | 979 | 990 | 989 | Mongolia | 989 | 975 | 996 |
| Bosnia and Herzegovina | 956 | 958 | 940 | Montenegro | 945 | 977 | 973 |
| Botswana | 997 | 962 | 980 | Nepal | 743 | 1019 | 957 |
| Brazil | 1027 | 1000 | 989 | Nicaragua | 957 | 976 | 977 |
| Bulgaria | 966 | 972 | 975 | Niger | 997 | 980 | 943 |
| Burkina Faso | 1000 | 955 | 937 | Nigeria | 995 | 939 | 974 |
| Cambodia | 985 | 989 | 1582 | Pakistan | 889 | 1000 | 1505 |
| Cameroon | 992 | 977 | 965 | Panama | 953 | 946 | 979 |
| Chad | 976 | 988 | 916 | Peru | 967 | 974 | 988 |
| Colombia | 984 | 990 | 990 | Philippines | 987 | 995 | 993 |
| Congo, Dem. Rep. | 980 | 967 | 973 | Romania | 974 | 963 | 973 |
| Congo, Rep. | 986 | 922 | 936 | Russian Federation | 1850 | 1875 | 1902 |
| Costa Rica | 995 | 989 | 981 | Rwanda | 988 | 995 | 976 |
| Croatia | 983 | 951 | 971 | Saudi Arabia | 891 | 998 | 997 |
| Cyprus | 982 | 979 | 1005 | Senegal | 997 | 997 | 923 |
| Dominican Republic | 991 | 996 | 995 | Serbia | 948 | 941 | 985 |
| Ecuador | 984 | 992 | 994 | Sierra Leone | 997 | 949 | 914 |
| Egypt, Arab Rep. | 1025 | 999 | 989 | Singapore | 998 | 945 | 979 |
| El Salvador | 972 | 988 | 981 | South Africa | 1000 | 976 | 958 |
| Gabon | 998 | 992 | 954 | Sri Lanka | 956 | 1038 | 1064 |
| Georgia | 989 | 991 | 943 | Taiwan, China | 950 | 960 | 991 |
| Ghana | 997 | 962 | 830 | Tajikistan | 885 | 972 | 861 |
| Guatemala | 978 | 992 | 996 | Tanzania | 996 | 980 | 973 |
| Guinea | 992 | 985 | 884 | Thailand | 983 | 993 | 957 |
| Haiti | 398 | 401 | 436 | Togo | 984 | 979 | 967 |
| Honduras | 988 | 974 | 993 | Turkmenistan | 996 | 957 | 995 |
| Hong Kong SAR, China | 991 | 992 | 879 | Uganda | 999 | 977 | 966 |
| Indonesia | 977 | 970 | 992 | Ukraine | 973 | 966 | 874 |
| Iraq | 829 | 999 | 986 | United Arab Emirates | 988 | 982 | 981 |
| Jordan | 973 | 994 | 997 | Uruguay | 921 | 989 | 990 |
| Kazakhstan | 884 | 897 | 949 | Uzbekistan | 982 | 968 | 990 |
| Kenya | 992 | 997 | 995 | Venezuela, RB | 979 | 974 | 997 |
| Kuwait | 939 | 1002 | 991 | Vietnam | 857 | 990 | 948 |
| Kyrgyz Republic | 993 | 942 | 984 | West Bank and Gaza | 994 | 996 | 994 |
| Lebanon | 909 | 998 | 999 | Zambia | 995 | 990 | 966 |

**Table A2.** Data Construction - Access to Credit Variables

| Variable | 2011 Survey Question | 2014 Survey Question | 2017 Survey Question |
|---|---|---|---|
| $anyloan_{ict}$ | In the past 12 months, have you borrowed any money from a bank, credit union (or another financial institution, where applicable - for example, cooperatives in Latin America), or microfinance institution? | In the past 12 months, have you, by yourself or together with someone else, borrowed any money from a bank, [insert all financial institutions], or another type of formal financial institution? This does NOT include credit cards. | In the past 12 months, have you, by yourself or together with someone else, borrowed any money from a bank or another type of formal financial institution? |
| $creditcard_{ict}$ | A credit card is like a debit card, but the money is not taken from your account right away. You get credit to make payments or buy things, and you can pay the balance off later. Do you have a credit card? | A credit card is a card that allows you to borrow money in order to make payments or buy things, and you can pay the balance off later. Do you, personally, have a credit card? | A credit card is a card that allows you to borrow money in order to make payments or buy things, and you can pay the balance off later. Do you, personally, have a credit card? |
| $mortgage_{ict}$ | Do you currently have a loan you took out for any of the following reasons? To purchase your home or apartment. | Do you, by yourself or together with someone else, currently have a loan you took out from a bank or another type of formal financial institution to purchase a home, an apartment, or land? | Do you, by yourself or together with someone else, currently have a loan you took out from a bank or another type of formal financial institution to purchase a home, apartment, or land? |
| $familyloan_{ict}$ | In the past 12 months, have you borrowed any money from family or friends? | In the past 12 months, have you, by yourself or together with someone else, borrowed any money from family, relatives, or friends? | In the past 12 months, have you, by yourself or together with someone else, borrowed any money from family, relatives, or friends? |
| $privloan_{ict}$ | In the past 12 months, have you borrowed any money from another private lender? | In the past 12 months, by yourself or together with someone else, borrowed any money from another private lender (for example, a/an [insert country-specific examples of private lenders, i.e., loan shark, payday lender, or pawn shop])? | In the past 12 months, have you, by yourself or together with someone else, borrowed any money from an informal savings group/club such as [local terminology for savings group/club]? |

**Appendix  B.  Appendix Figures**

Figure A1: Growth in the number of foreign banks before and after information sharing institution's start of operations
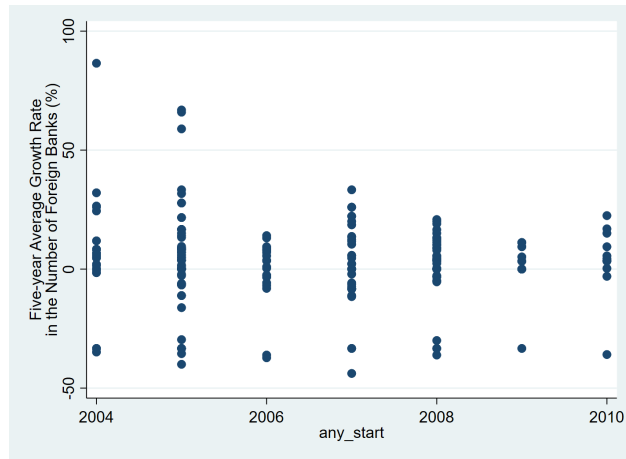


(a) Before start of operations
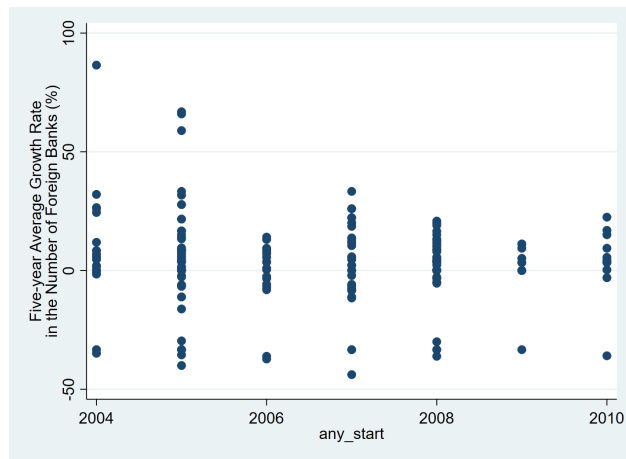


(b) After start of operations

Note: These figures graph the three-year growth rate in the number of foreign banks before and after the start of operations of information sharing institutions.