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**DENYING FOREIGN BANK ENTRY:
IMPLICATIONS FOR BANK INTEREST MARGINS**

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**DENYING FOREIGN BANK ENTRY:
IMPLICATIONS FOR BANK INTEREST MARGINS**

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Resumen

Este artículo analiza el efecto de restringir la entrada de bancos extranjeros sobre los márgenes bancarios netos mientras se controla por (a) los impedimentos a la entrada de bancos, (b) el grado de propiedad de bancos extranjeros de la industria bancaria nacional, (c) una variedad de características bancarias específicas, (d) la concentración del sector bancario y (e) diversos rasgos propios del país. Con datos de cerca de 1.200 bancos en 47 países, los resultados sugieren que cuando se restringe la entrada de bancos extranjeros, los márgenes netos de la banca aumentan. Además, restringir la entrada de bancos extranjeros es especial ya que restringir la entrada de bancos locales no ayuda a explicar los márgenes bancarios y el grado de propiedad de bancos extranjeros tiene solo un efecto insignificante.

Abstract

This paper examines the impact of restricting foreign bank entry on bank net interest margins while controlling for (a) impediments to domestic bank entry, (b) the degree of foreign bank ownership of the domestic banking industry, (c) an array of bank-specific characteristics, (c) banking sector concentration, and (d) various country traits. Using data on almost 1200 banks across 47 countries, the results suggest that restricting foreign bank entry boosts bank net interest margins. Also, restricting foreign bank entry is special since restricting domestic bank entry does not help explain bank margins and the degree of foreign bank ownership also enters insignificantly.

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I. Introduction

This paper examines the impact of policies toward foreign bank entry on commercial bank net interest margins. Do countries that impede the entry of foreign banks induce a bigger gap between the interest expense paid to depositors and the interest income received from borrowers after controlling for bank-specific characteristics, macroeconomic conditions, and structure of the economy's banking industry? Thus, the paper provides information on the efficiency effects of regulatory restrictions on foreign bank entry.

The paper goes farther, however, and assesses whether there is something special about foreign banks. Regulatory restrictions on foreign bank entry may be highly correlated with regulatory restrictions on domestic bank entry. If this is the case, then information on foreign banks may simply proxy for entry restrictions in general, rather than providing information on foreign banks in particular. To examine the independent impact of restrictions on foreign bank entry, I simultaneously control for restrictions on domestic bank entry. Thus, the paper provides information on the efficiency effects of regulatory restrictions on foreign bank entry independent from impediments to domestic bank entry.

Furthermore, the paper distinguishes between impediments to foreign bank entry and the fraction of the domestic banking industry owned by foreign banks. Some researchers focus on the degree of foreign bank ownership (Clarke, Cull, and Martinez-Peria, 2001). Others, however, argue that openness to foreign banks is crucial because it makes the domestic market contestable (Demirguc-Kunt, Levine, and Min, 1998; Claessens, Demirguc-Kunt, and Huizinga, 2001). From this perspective, the crucial issue

is access, not the actual fraction of the domestic banking industry owned by foreign banks (Clarke, Cull, D'amato, and Molinari, 2000; Clarke, Cull, Martinez-Peria, and Sanchez, 2003). To examine the independent impact of restrictions on foreign bank entry from actual foreign bank participation, I simultaneously control for the fraction of domestic banking assets associated with foreign owned banks. Thus, the paper provides information on the efficiency effects of regulatory restrictions on foreign bank entry independent of (i) impediments to domestic bank entry and (ii) the actual degree of foreign bank ownership.

This is the first paper to study the relationship between net interest margins and the fraction of foreign entry applications denied by the commercial bank supervisory agency when controlling for regulatory restrictions on domestic bank entry and foreign ownership. I use bank-level data on 1165 banks across 47 countries. While other studies examine the actual degree of foreign bank participation (Clarke, Cull, and Martinez-Peria, 2001), I simultaneously study the rate at which countries reject applications by foreign banks. While some studies use information on the number of foreign banks operating in the economy to proxy for the contestability of the market (Claessens, Demirguc-Kunt, and Huizinga, 2001), I use direct information on the fraction of foreign entry applications denied to gauge the regulatory barriers to foreign bank entry. Furthermore, while other studies do not control for regulatory restrictions on domestic bank entry, this paper controls for the fraction of domestic entry applications that are rejected by the supervisory agency. For more on the impact of various supervisory and regulatory policies on bank efficiency, see Demirguc-Kunt, Laeven, and Levine (2002). Thus, I simultaneously examine the impact of (a) impediments to domestic bank entry,

(b) impediments to foreign bank entry, and (c) the degree of foreign bank ownership of the domestic banking industry on net interest margins.

To assess the independent link between foreign banks and commercial bank net interest margins, I control for an array of bank-specific and country-specific characteristics. In particular, I control for bank size, the degree to which banks hold liquid assets, the ratio of equity to total assets, the extent to which banks earn fee income, bank overhead expenditures, and the variability of bank profits. In terms of country-specific variables, I control for inflation and the level of bank concentration in each country. Results on the relationships between interest margins and bank-specific and country-specific factors are valuable. For this paper, however, the purpose of controlling for these factors is to identify the impact of policies toward foreign banks on net interest margins.

The data indicate that impediments to foreign bank entry boost bank net interest margins. Moreover, the paper finds that foreign banks are special. When controlling for impediments to domestic bank entry, restrictions on foreign bank entry continue to explain bank net interest margins. Indeed, while foreign bank entry restrictions enter significantly, domestic bank entry restrictions do not explain bank interest margins. Furthermore, it is impediments to foreign bank entry, not foreign bank ownership per se. The actual fraction of the domestic banking industry controlled by foreign owned banks does not help account for bank interest margins. But, the fraction of foreign entry applications denied continues to explain bank interest margins even when controlling for the degree of foreign bank ownership. Contestability by foreign banks is an important determinant of bank interest margins. In sum, the paper finds that regulatory restrictions

on foreign bank entry exert an independent impact on bank interest margins after controlling for (i) impediments to domestic bank entry, (ii) the actual degree of foreign bank participation, (iii) bank-specific factors, (iv) macroeconomic stability, and (v) banking sector concentration.

While the positive relationship between the fraction of foreign bank entry applications denied and net interest margins is robust to alterations in the conditioning information set, there may be concerns with the measure of foreign bank entry restrictions. First, the fraction of foreign entry applications rejected by the regulatory agency may not accurately measure excessive regulatory impediments to foreign bank entry. If foreign banks expect that a country is likely to reject foreign bank entry applications, they (i) may be reluctant to apply or (ii) may use bribes and other measures prior to submitting an application. Under these conditions, a low rejection rate will not reflect bribes and other obstacles faced by foreign banks. Second, there may be sound prudential reasons for rejecting foreign banks. If foreign banks are not well managed and properly supervised in their home countries, a country may have legitimate reasons for rejecting their entry. Thus, high rejection rates may not suggest excessive entry barriers.

These concerns, however, would bias the results against finding a relationship between the fraction of foreign entry applications denied and bank margins. Moreover, when I use an instrumental variables estimator and employ different sets of instruments, I continue to find that restricting foreign bank entry boost net interest margins.

The remainder of the paper is organized as follows. Section II discusses the methodology and data. Section III presents the results and Section IV concludes.

II. Methods, Data, and Summary Statistics

B. Methodology

This paper examines the impact of restrictions on foreign bank entry on net interest margins while controlling for bank-specific effects and country-specific traits.

Specifically, I estimate the following regression.

$$\text{Net Interest Margin}_{i,k} = \alpha + \beta_1 F_i + \beta_2 B_{i,k} + \beta_3 C_i + \varepsilon_{i,k} \quad (1)$$

In the specification, i indexes country i , and k indexes bank k , so that

F_i is a measure of restrictions on foreign bank entry in country i ;
 $B_{i,k}$ is a vector of bank-specific characteristics for bank k in country i ;
 C_i is a vector of country specific traits,
 $\varepsilon_{i,k}$ is the residual.

The equation is primarily estimated using a generalized least squares estimator with random effects, though I also present the fixed effects estimates on the bank-specific variables. Furthermore, at the end of the paper, I extend the analysis and use a two-stage generalized least squares random effects estimator for this panel-data model.

B. Data

This paper uses two primary data sources. First, data for the bank-specific variables are obtained from the BankScope database, which is provided by Fitch-IBCA. The data are for commercial banks and account for 90 percent of all banking assets. Second, data for regulatory restrictions on bank entry are obtained from the Barth, Caprio, and Levine (henceforth BCL, 2001, 2002) database. BCL conduct a survey of national regulatory agencies. The responses to this survey regarding the denial of entry applications primarily cover the period 1997-1998.

After combining the datasets, there are data on 1165 banks across 47 countries. The country coverage is quite broad, ranging from the richest countries in the world to the poorest and covering all regions of the globe. The sample is as follows:

AUSTRALIA, AUSTRIA, BAHRAIN, BANGLADESH, BELGIUM, BOTSWANA, BURUNDI, CANADA, CHILE, CYPRUS, CZECH REPUBLIC, DENMARK, FINLAND, FRANCE, GERMANY, GHANA, GREECE, HUNGARY, ICELAND, INDIA, IRELAND, ITALY, JAMAICA, JAPAN, LATVIA, LEBANON, LITHUANIA, LUXEMBOURG, MALTA, MOLDOVA, NAMIBIA, NETHERLANDS, NEW ZEALAND, NIGERIA, PANAMA, PERU, PHILIPPINES, POLAND, ROMANIA, RWANDA, SOUTH AFRICA, SPAIN, SWEDEN, SWITZERLAND, TAIWAN, TRINIDAD AND TOBAGO, and the USA. I conduct the analyses on various subsets of countries to assess the robustness of the findings.

C. Variable Definitions

1. Net Interest Margin

Net interest margin equals interest income minus interest expense divided by interest-bearing assets. The net interest margin measure measures the gap between what the bank pays the providers of funds and what the bank gets from firms and other users of bank credit. Since the net interest margin focuses on the conventional borrowing and lending operations of the bank, I normalize by interest-bearing assets rather than total assets. I compute and examine the net interest margin over two periods. First, I average over the 1995-1999 period so that one year does not dominate. The disadvantage of this approach is that the main explanatory variable, denial of foreign bank entry applications, is computed primarily over the 1997-1998 period. I do not believe that this is an

important disadvantage, however, because Barth, Caprio, and Levine (2001a) and Carkovic and Levine (2002) show that bank supervision and regulation has changed very remarkably little. Second, I examine the net interest margin computed in 1999. This alleviates any concerns about the timing of the dependent and independent variables. The disadvantage is that business-cycle phenomena and crises may unduly influence margins in 1999. In any event, the results are the same in using either net interest margins in 1999 or averaged over the 1995 to 1999 period. The results reported below use the net interest margin averaged over the years 1995-1999. From Table 1, one sees great cross-country variability in average net interest margins. Ghana, Burundi, and Moldova have net interest margins of greater than ten percent. In contrast, Finland, the Netherlands, Switzerland, and Luxembourg have net interest margins of less than two percent.

Since the net interest margin is subject to measurement problems, it is crucial to use a variety of control variables and sensitivity checks to mitigate problems with interpreting the findings. I want to hold a sufficient amount constant such that greater net interest values reflect either operational inefficiency or market power. Confounding issues arise, however. For instance, banks engaging in fee income generating activities may have different net interest margins because of cross-subsidization of activities. In this case, cross-bank differences in net interest margins may reflect difference in bank activity, rather than differences in efficiency or competition. Also, bank inefficiencies and market conditions may yield high overhead costs rather than large interest margins. Thus, cross-bank differences in net margins may reflect choices regarding whether to enjoy high overhead costs or large margins rather than reflecting differences in efficiency and competition. Furthermore, bank margins may reflect different asset allocations and

risk tastes of firms, so that the net interest margin may reflect equity premia. While equity premia will be incorporated into the net interest margin, I control for bank equity and bank risk and also obtain consistent results when controlling for bank profitability and the share of non-performing loans in the economy. These measurement and interpretational concerns emphasize the need to control for bank specific characteristics.

2. Bank-Specific Control Variables

Bank-size equals the logarithm of total bank assets in millions of US dollars in 1995. I use the 1995 figure to reduce potential simultaneity with net interest margins but the results do not change when using bank-specific control variables averaged over the 1995-99 period. As shown in Table 1, there is extraordinary cross-country variation in the average size of banks. Large banks may reduce net interest margins if there are increasing returns to scale. Alternatively, large banks may increase net interest margins if they exert market power.

Bank equity equals the book value of equity divided by total assets in 1995. Some theories suggest that highly capitalized banks face a lower probability of bankruptcy and hence lower funding costs. This will produce larger net interest margins if the interest charged on loans does not drop markedly with more highly capitalized banks. As with all the bank-specific control variables, we present the results, but our focus is on using these as control variables since this paper's focus is on assessing the impact of regulatory restrictions on foreign banks.

Bank overhead equals overhead costs divided by total assets in 1995. I use this variable to control for cross-bank differences in organization and operation. Different organizations will choose different business systems, product mixes, and asset allocations

with consequently different overhead cost structures. Large overhead costs may reflect bank inefficiencies or market power in a similar fashion to net interest margins. Thus, I expect to see a very high, positive correlation between bank overhead and net interest margins. Indeed, including overhead costs may be so highly correlated with net interest margin that including bank overhead as a regressor substantively lower the likelihood of finding that other variables explain net interest margin. I obtain the same results when including or excluding bank overhead.

Fee income equals non-interest-operating income divided by total assets in 1995. Banks have different product mixes. Since banks engage in different non-lending activities, these other activities may influence the pricing of loan products due to cross-subsidization of bank products. Thus, I include fee income to control of cross-bank differences in the products offered by banks.

Bank liquidity equals the liquid assets of the bank divided by total assets. Some argue that banks with a high level of liquid assets will receive lower interest income than banks with less liquid assets. This asset allocation, however, does not necessarily reflect greater efficiency. Thus, I control for bank liquidity in 1995.

Bank risk equals the standard deviation of the rate of return on bank assets over the period 1995-99. Some hold that banks operating in more risky environment will tend toward an equilibrium characterized by a high net interest margin to compensate for this risk. Thus, to assess the independent effect of restrictions on foreign bank entry, it is important to control for individual bank risk.

3. Fraction Foreign Denied & Other Country-Specific Variables

Fraction Foreign Denied equals the fraction of commercial banking applications from foreign banks that are denied by the regulatory authority. These are based on the Barth, Caprio, and Levine (2001a,b, 2003) survey of bank supervision and regulation. Some countries during this period were completely closed to the entry of foreign banks, such as Burundi, Chile, and Jamaica. Others, such as Austria, South Africa, Canada, and Panama had denial rates of between five and twenty percent. Still others had denial rates of zero, i.e., no foreign bank applications were denied. As shown in Table 1, the mean value of fraction foreign denied is 0.13 with a standard deviation of 0.28.

There are problems with the fraction foreign denied variable. If a country does not allow foreign entry, then foreign banks will not apply and there will be no applications. If a country heavily restricts foreign entry, there may be few applications. In this case, those that do apply may use bribes and other measures prior to issuing an application. Thus, denial rates may be low even in countries that heavily restrict foreign entry. Similar, measurement problems may arise because there are countries where (a) a foreign bank can enter by purchasing a domestic bank but (b) this mode of entry does not require the foreign bank to apply for a commercial banking license. Given the way in which the survey was conducted, this type of entry will not be captured. It will not be measured as an application. These measurement problems should bias the results against finding a robust link between the fraction of foreign entry applications denied and net interest margin. Nevertheless, I use instrumental variables to mitigate the problem associated with pure measurement error and confirm the results.

Fraction Domestic Denied equals the fraction of entry applications by domestic entrepreneurs that are denied by the regulatory authority. As with the fraction foreign

denied, there is extensive cross-country variation. I examine fraction domestic denied primarily as a control variable. Is fraction foreign denied associated with net interest margin beyond the fraction domestic denied? Thus, is there something special about restricting foreign bank entry?

Foreign Ownership equals the fraction of banking system assets held by banks that are 50 percent or more foreign owned. These data are from the BCL survey. In some countries, virtually all of the banking system is foreign owned, such as in New Zealand, Botswana, and Luxembourg. In other countries, none of the banking system is foreign owned, such as in Nigeria, India, Iceland, and Burundi. I use foreign ownership to assess whether foreign ownership is crucial in explaining bank margins, or whether it is the contestability of the banking market – as proxied by fraction foreign denied – that is crucial for accounting difference in net interest margin.

Inflation equals the log difference of the consumer price index over the 1995-99 period and is taken from the World Bank's World Development Indicators. Some work suggests that inflation will expand the wedge between interest income and interest expense. If macroeconomic instability is also associated with restrictions on foreign competition, then impediments to foreign banks may reflect general macroeconomic malaise rather than the independent influence of restrictions on foreign banks on bank margins. Thus, I control for inflation in assessing the links between regulatory impediments to foreign bank entry and bank margins.

Concentration equals the fraction of assets held by the three largest commercial banks in each country. Banking system structure may influence net interest margins. Indeed, regulatory restrictions on bank entry may influence net interest margins by

increasing concentration and hence the market power of banks. I am interested in examining the impact of entry restrictions on net interest margins. I am less interested here in exploring whether restrictions on foreign bank entry influence concentration and through concentration net interest margins. Thus, I first conduct the analyses without concentration to assess the direct impact of fraction foreign denied on net interest margins. Then, I control for concentration.

D. Correlations

The correlations in Table 2 foreshadow key elements of this paper's analyses. Fraction foreign denied is positively and significantly correlated with net interest margins. Fraction domestic denied is also positively and significantly correlated with net interest margins. While fraction foreign denied and fraction domestic denied are positively correlated with each other, the correlation coefficient is only 0.50, which indicates that regulatory restrictions on foreign and domestic banks do not move one-for-one with each other. The correlations also show that foreign bank ownership is not significantly correlated with net interest margins or the denial of bank entry.

III. Regression Results

A. Preliminary regressions

As a preliminary step, Table 3 presented panel results using both random and fixed effects for only the bank specific variables. As shown, the coefficient estimates from the random and fixed effect estimators are very close. In later regressions when including country-specific variables, the regressions are run using random effects.

The coefficient estimates on the bank-specific variables suggest the following. Unsurprisingly, banks with large overhead costs also have large net interest margins. To

the extent that large overhead expenditures and wide margins at least partially reflect bank inefficiency, then these bank characteristics will be positively related. The results indicate that big banks tend to have smaller margins. While I do not fit a cost curve, this finding is not inconsistent with arguments of economies of scale in banking. While equity as a fraction of bank assets is not significantly related to net interest margins, banks that hold more liquid assets tend to have lower margins. This may reflect the lower remuneration on liquid assets. Finally, Table 3 demonstrates the negative relationship between fee income and interest margins. Banks that receive more income through non-interest earning activities have a smaller net interest income as a share of interest bearing assets. While by no means conclusive and also not the focus of the analysis here, this finding is consistent with arguments of cross-subsidization of activities within the bank.

B. Interest margins and foreign banks

Table 4 presents regressions including all the bank-specific variables and combinations of (i) fraction foreign denied, (ii) foreign ownership, and (iii) fraction domestic denied. The coefficients on the bank-specific variables are not included in the tables, though they do not vary much from the estimates in Table 3. As noted, the regressions are run using generalized least squares with random effects.

The results indicate that greater restrictions on foreign bank entry – as proxied by fraction foreign denied – is positively associated with net interest margins. That is, restricting foreign bank entry boost the gap between interest received and income paid as a fraction of interest earning assets. Furthermore, the results suggest that restricting foreign banks from entering is special.

The size of the coefficient is economically large. Consider the coefficient on the final regression in Table 4 on fraction foreign denied, which equals 3. This suggests that if Chile had the mean value of fraction foreign denied of 0.13 instead of its value of 1 over the estimation period its net interest margin on banks would be 2.6 percentage points lower (3×0.87). This would imply a reduction in Chile's net interest margin from 5.0 to 2.4 and bring Chile's average net interest margin below the sample mean of 3.5.

The Table 4 regressions also indicate that foreign bank ownership of domestic banking assets and the fraction domestic denied are not significantly correlated with net interest margins. Foreign ownership per se is not crucial, but regulatory restrictions on foreign bank entry do impact net interest margins. These results highlight the importance of the contestability of the market. The results are consistent with argument that reducing the potential entry of foreign banks allows net interest margins to grow. Furthermore, restricting the entry of domestic bank is not as critical. While restricting foreign bank entry boost net interest margins, domestic bank does not enter the regression significantly.

Finally, when including (i) fraction foreign denied, (ii) foreign ownership, and (iii) fraction domestic denied simultaneously in the net interest margin regression, I find that only the fraction of foreign denied enter significantly. Even after controlling for regulatory restrictions on domestic bank entry and after controlling for the degree of foreign ownership of the domestic banking industry, the results continue to indicate that impediments to foreign bank entry boost net interest margins.

C. Sensitivity analyses

Readers may have concerns over the sample of countries, which includes Transition economies, Sub-Saharan African countries, and the United States, which has thousands of banks. Thus, it is important to assess whether the Table 4 results hold on sub-sets of countries. Table 5 presents the results four sub-sets of countries: (i) eliminating Sub-Saharan African countries, (ii) eliminating formerly socialist countries, (iii), eliminating the United States, and (iv) eliminating Sub-Saharan African countries, formerly socialist countries, and the United States.

Even in the sub-sample that yields the smallest coefficient on fraction foreign denied, the coefficient suggests an economically meaningful magnitude. Specifically, the coefficient in regression 5, suggests that if Chile had the mean value of fraction foreign denied of 0.13 instead of its value of 1, its net interest margin on banks would be 1.4 percentage points lower (1.6×0.87). This would imply a reduction in Chile's net interest margin from 5.0 to 3.6 and bring Chile's average net interest margin close to the sample mean of 3.5. Thus, the robustness check using sub-sample of countries confirm the economically large impact of restricting foreign bank entry on net interest margins.

The Table 5 results indicate that the fraction foreign denied enters positively and significantly at the 0.01 in various sub-samples of countries. Thus, the finding that regulatory restrictions on foreign bank entry boost net interest margins is robust to alternations in the sample of countries.

It is also important to control for other country and bank characteristics. For instance, macroeconomic instability may produce large interest margins and macroeconomic instability may also create a political environment that takes a wary stance toward foreign competition. In this case, the positive relationship between

regulatory restrictions on foreign bank entry and bank margins would reflect macroeconomic stability, not an independent relationship between entry restrictions on foreign banks and net interest margins. Thus, I control for inflation. Similarly, bank risk and the concentration of the banking industry may influence bank net interest margins. If these factors are not controlled for, then we have correspondingly less confidence in the results on entry restrictions on foreign banks and bank margins.

The Table 6 results indicate that the positive relationship between fraction foreign denied and bank net interest margins is robust to including inflation, the variability of the rate of return on bank assets (bank risk), and the concentration of the banking industry for each country. Inflation enters all of the regressions positively and significantly at the 0.01 level. Bank risk and concentration enter some of the regressions significantly at the 0.10 level. For the purposes of this paper, note that regulatory restrictions on foreign bank entry enters all of the regression significantly at the 0.01 level.

D. Robustness check using instrumental variables

This subsection uses a two-stage generalized least squares estimator to assess whether the exogenous component of the fraction of foreign entry applications that are denied is associated with bank net interest margins. As discussed above, there may be problems associated with measuring restrictions on foreign bank entry. I use two different types of instrumental variables in conducting robustness checks.

First, as argued by Demirguc-Kunt, Laeven, and Levine (2002), regulatory impediments on banks reflect broad national institutional characteristics. Thus, I first use the Kaufman, Kraay, and Zoido-Lobaton (2001) measure of institutional development as an instrument for entry restrictions. Specifically, Kaufman, Kraay, and Zoido-Lobaton

(2001) compile information on (i) voice and accountability, i.e., the extent to which citizens can choose their government and enjoy political rights, civil liberties, and an independent press, (ii) political stability, i.e., a low likelihood that the government will be overthrown by unconstitutional or violent means, (iii) government effectiveness, i.e., the quality of public service delivery, competence of civil servants, and the absence of politicization of the civil service, (iv) light regulatory burden, i.e., relative absence of government controls on goods markets, government interference in the banking system, excessive bureaucratic controls on starting new businesses, or excessive regulation of private business and international trade, (v) rule of law, i.e., protection of persons and property against violence or theft, independent and effective judges, contract enforcement, (vi) freedom from graft – absence of the use of public power for private gain, corruption. These components have values between zero and two, where larger values imply better institutions. I average these components for each country into an aggregate measure of institutional development. The correlation between this aggregate institutional index and the fraction of entry applications denied is -0.63 and is significant at the 0.05 level.

When using this aggregate institutional index as an instrumental variable, I confirm all of the paper's findings with little change in the coefficient estimates. Thus, the results are robust to pure measurement error. Moreover, these instrumental variable findings provide an economically intuitive story. National institutions and attitudes toward competition are reflected in policies, such as impediments to foreign bank entry, and hence in bank net interest margins.

As a second robustness check, I use an alternative, arguably more exogenous, instrumental variable. Specifically, I use the absolute value of the latitude of the country as an instrument. From an economic perspective, Acemoglu, Johnson, and Robinson (2001, henceforth AJR) and Engerman and Sokoloff (1997) argue that geographical endowments influenced the formation of long lasting institutions that continue to shape national policies toward international openness and competition. This argument is based on the following building blocks. First, European colonists adopted different colonization strategies. At one end of the spectrum, the Europeans settled and created institutions to support private property, check the power of the State, and foster open, competitive economies. These “settler colonies” include the United States, Australia, and New Zealand. At the other end of the spectrum, Europeans did not aim to settle and instead sought to extract as much from the colony as possible. In these “extractive states,” Europeans did not create institutions to support private property rights and foster internationally open economies; rather, they established institutions that empowered and protected the elite. (e.g., Congo, Ivory Coast, and much of Latin America). The second component of AJR’s theory holds that the type of colonization strategy was heavily influenced by the feasibility of settlement. In inhospitable environments, Europeans tended to create extractive states (AJR, 2001). In areas where endowments favored settlement, Europeans tended to form settler colonies. Third, the institutions created by European colonizers endured after independence. Settler colonies tended to produce post-colonial governments that were more devoted to defending private property rights and promoting competition than extractive colonies. In contrast, since extractive colonies had already constructed institutions for effectively extracting resources, the post-colonial

elite frequently assumed power and readily exploited the pre-existing extractive institutions. While imperfect, I use the absolute value of latitude to proxy for geographical endowments. This proxy for geographical endowments is particularly problematic for non-colonies, so I confirm all the findings various sub-samples. For more on using latitude to proxy for geographical endowments, see Beck, Demirguc-Kunt, and Levine (2003) and Easterly and Levine (2003).

Table 7 presents simple, pure cross-country regressions that suggest the appropriateness of using latitude as an instrumental variable for regulatory restrictions on foreign bank entry. In these regressions, net interest margin refers to the simple, un-weighted average of net interest margins across the country's banks. The first regression indicates that latitude significantly explains net interest margins. The second regression confirms that fraction foreign denied also explains net interest margins.

Table 7's third regression indicates that latitude significantly explains cross-country variation in regulatory restrictions on foreign bank entry at the 0.01 significance level. Importantly, the fourth regression presents regressions results of net interest margin against both latitude and fraction foreign denied. While fraction foreign denied enters significantly, latitude does not. This is consistent with the view that latitude explains net interest margin through its effect on fraction foreign denied. Indeed, the last regression in Table 7 uses latitude as an instrumental variable for fraction foreign denied. It indicates that in this pure cross-country context, the exogenous component of fraction foreign denied is positively associated with the average value of net interest margin.

Returning to bank-level data, Table 8 presents two-stage least squares regressions of individual net interest margins on bank-specific characteristics, various country-

specific control variables, and fraction foreign denied, where latitude is used as an instrument for fraction foreign denied. As shown, the exogenous component of fraction foreign denied enters all of the regressions positively and significantly. Inflation also enters positively and significantly. Concentration and bank risk, however, do not enter these two-stage generalized least squares significantly. In sum, the finding that regulatory restrictions on foreign bank entry boost bank net interest margins is robust to instrumenting for fraction foreign denied.

IV. Conclusion

This paper examined the impact of regulatory impediments to foreign bank entry on bank net interest margins. To proxy for restrictions on foreign bank entry, I used the fraction of foreign bank entry applications denied by the regulatory authority of the country. The investigation uses data on 1165 banks across 47 countries and controls for numerous bank-specific and country-specific factors.

The paper also isolated the effect of restrictions on foreign bank entry from (1) restrictions on domestic bank entry and (2) foreign bank ownership of the domestic banking industry. Thus, the paper examined the extent to which restricting foreign bank entry is special. To accomplish this, I simultaneously controlled for regulatory restrictions on domestic entry and the fraction of domestic banking systems assets held by foreign owned banks.

The paper concludes that impediments to foreign bank entry exert a positive impact on bank net interest margins. Furthermore, I find that foreign banks are special. When controlling for impediments to domestic bank entry and the extent of foreign bank ownership, restrictions on foreign bank entry continue to explain bank net interest

margins. Indeed, while foreign bank entry restrictions enter significantly, neither domestic bank entry restrictions nor foreign bank ownership help explain bank interest margins. Contestability by foreign banks importantly determines bank interest margins. This paper's findings are confirmed when using instrumental variables to proxy for differences in national institutions that yield different policies toward foreign banks. These instrumental variable results increase confidence in the conclusion that restricting foreign bank entry increases bank interest margins, while cautioning that this relationship may reflect deeper institutional traits.

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Table 1: Summary Statistics

The number of countries is 47. The number of bank observations is 1165. Interest margin is averaged over the 1995-99 period. The other bank-specific variables are from 1995. Regulatory variables on fraction of foreign and domestic entry applications denied and foreign bank ownership are from the Barth, Caprio, and Levine (2003) dataset.

Variable	Obs	Mean	Std.Dev.	Min	Max
Interest Margin	1165	3.462	1.940	0.719	12.601
Bank Size	1165	7.144	1.980	1.939	13.488
Bank Liquidity	1165	21.376	16.410	0.233	82.190
Bank Equity	1165	8.553	6.335	-0.768	78.763
Fee Income	1165	0.890	1.442	-6.386	13.803
Bank Overhead	1165	3.000	1.773	0.150	15.721
Fraction Foreign Denied	47	0.131	0.276	0.000	1.000
Fraction Domestic Denied	47	0.205	0.306	0.000	1.000
Foreign Ownership	38	0.257	0.277	0.000	0.990
Latitude	47	0.403	0.196	0.022	0.722

Table 2: Simple Cross-Country Comparisons

	Interest Margin	Fraction Foreign Denied	Fraction Domestic Denied	Foreign Ownership
Fraction Foreign Denied	0.468*** (0.0009) 47	1 47		
Fraction Domestic Denied	0.385*** (0.0075) 47	0.5*** (0.0003) 47	1 47	
Foreign Ownership	0.1167 (0.4852) 38	0.0707 (0.6731) 38	0.0795 (0.6351) 38	1 38

Notes: *, **, *** indicate significance at the 10, 5, and 1 percent respectively. (P-values in parentheses.) * indicates significant at the five percent level.

Table 3: Regressions controlling only for bank-specific factors

Dependent variable is Interest margins, which is averaged over the 1995-99 period. The other bank-specific variables (Bank overhead, Bank size, Bank liquidity, Bank equity, Fee income) are measured in 1995. The estimation is done using GSL with random or fixed effects as indicated. A constant term was included, but is not reported. *, **, *** indicate significance at the 10, 5, and 1 percent respectively. P-values are in parentheses.

	(1)	(2)
Bank Overhead	0.537*** (0.000)	0.515*** (0.000)
Bank Size	-0.107*** (0.000)	-0.096*** (0.000)
Bank Liquidity	-0.015*** (0.000)	-0.016*** (0.000)
Bank Equity	0.005 (0.319)	0.007 (0.224)
Fee Income	-0.341*** (0.000)	-0.344*** (0.000)
R2-within	0.364	0.3647
R2-between	0.5574	0.5224
No. Obs.	1165	1165
No. countries	47	47
Estimation	Random Effect	Fixed Effects

Table 4: Interest Margins and Restrictions on Foreign Bank Entry

Dependent variable is Interest margins, which is averaged over the 1995-99 period. The regression includes five bank-specific variables (Bank overhead, Bank size, Bank liquidity, Bank equity, Fee income) that are measured in 1995 and a constant term, but these are not reported below. The regressions include measures of the fraction of foreign bank entry applications denied, domestic bank entry applications denied, and foreign bank ownership. The estimation is done using GSE with random effects. *, **, *** indicate significance at the 10, 5, and 1 percent respectively. P-values are in parentheses.

	(1)	(2)	(3)	(4)
Fraction Foreign Denied	3.450*** (0.000)			3.060*** (0.000)
Foreign Ownership		0.680 (0.420)		0.362 (0.639)
Fraction Domestic Denied			1.184 (0.114)	0.723 (0.373)
R2-within	0.364	0.299	0.364	0.299
R2-between	0.574	0.521	0.591	0.529
No. Obs.	1165	900	1165	900
No. countries	47	38	47	38

Table 5: Interest Margins and Restrictions on Foreign Bank Entry: Sub-Samples

Dependent variable is Interest margins, which is averaged over the 1995-99 period. The regression includes five bank-specific variables (Bank overhead, Bank size, Bank liquidity, Bank equity, Fee income) that are measured in 1995 and a constant term, but these are not reported below. The regressions include measures of the fraction of foreign bank entry applications denied, domestic bank entry applications denied, and foreign bank ownership. The estimation is done using GSE with random effects. *, **, *** indicate significance at the 10, 5, and 1 percent respectively. P-values are in parentheses.

	(1)	(2)	(3)	(4)	(5)
<u>Sub-sample of countries:</u>	Omit Sub-Saharan Africa (SSA)	Omit Formerly Socialist (FS)	Omit USA	Omit SSA, FS, & USA	Omit SSA, FS, & USA
Fraction Foreign Denied	1.972*** (0.004)	3.594*** (0.000)	3.401*** (0.000)	1.896*** (0.000)	1.585** (0.042)
Foreign Ownership					0.107 (0.832)
Fraction Domestic Denied					0.587 (0.379)
R2-within	0.371	0.405	0.368	0.434	0.344
R2-between	0.681	0.612	0.610	0.815	0.798
No. Obs.	1144	1107	930	851	600
No. countries	41	40	46	33	26

Table 6: Interest Margins and Restrictions on Foreign Bank Entry: Other Controls

Dependent variable is Interest margins, which is averaged over the 1995-99 period. The regression includes five bank-specific variables (Bank overhead, Bank size, Bank liquidity, Bank equity, Fee income) that are measured in 1995 and a constant term, but these are not reported below. The regressions include measures of the fraction of foreign bank entry applications denied, domestic bank entry applications denied, and foreign bank ownership. The estimation is done using GSE with random effects. *, **, *** indicate significance at the 10, 5, and 1 percent respectively. P-values are in parentheses.

	(1)	(2)	(3)	(4)
Fraction Foreign Denied	2.09*** (0.001)	2.035*** (0.001)	1.902*** (0.001)	2.317*** (0.003)
Foreign Ownership				0.239 (0.729)
Fraction Domestic Denied				-0.409 (0.584)
Inflation	0.118*** (0.000)	0.121*** (0.000)	0.115*** (0.000)	0.119*** (0.000)
Bank Risk		-0.057 (0.221)	-0.056 (0.226)	-0.121* (0.082)
Concentration			1.371* (0.052)	1.564* (0.073)
R2-within	0.365	0.365	0.365	0.300
R2-between	0.738	0.741	0.756	0.727
No. Obs.	1137	1137	1137	872
No. countries	46	46	46	37

Table 7: Simple Cross-Country Regressions

These regressions are cross-country regressions. Interest margin is averaged over the bank in each country over the 1995-1999 period. Latitude is the absolute value of the latitude of the country. Fraction Foreign Denied is the fraction of foreign bank entry applications denied.

	Dependent Variable				
	Interest Margin	Interest Margin	Fraction Foreign Denied	Interest Margin	Interest Margin
Latitude	-5.18** (0.016)		-0.623*** (0.009)	-2.919 (0.152)	
Fraction Foreign Denied		4.55*** (0.003)		3.638** (0.015)	8.324** (0.013)
Countries	47	47	47	47	47
R-square	0.143	0.219	0.196	0.255	
Estimation	OLS	OLS	OLS	OLS	2SLS

Notes: *, **, *** indicate significance at the 10, 5, and 1 percent respectively. (P-values in parentheses.) OLS: ordinary least squares with robust standard errors. 2SLS: Two-stage least squares where latitude is used as an instrument for Fraction Foreign Denied.

Table 8: Interest Margins and Restrictions on Foreign Bank Entry: Instrumental Variables

Dependent variable is Interest margins, which is averaged over the 1995-99 period. The regression the absolute value of a country's latitude as an instrument for Fraction Foreign Denied. The regression includes five bank-specific variables (Bank overhead, Bank size, Bank liquidity, Bank equity, Fee income) that are measured in 1995 and a constant term, but these are not reported below. The regressions include measures of the fraction of foreign bank entry applications denied, domestic bank entry applications denied, and foreign bank ownership. The estimation is done using a two-stage GMM with random effects. *, **, *** indicate significance at the 10, 5, and 1 percent respectively. P-values are in parentheses.

	(1)	(2)	(3)	(4)
Fraction Foreign Denied	8.287*** (0.000)	7.047*** (0.003)	6.958*** (0.001)	6.969*** (0.001)
Inflation		0.081*** (0.006)	0.083*** (0.001)	0.079*** (0.001)
Bank Risk			-0.052 (0.268)	-0.052 (0.269)
Concentration				0.815 (0.436)
R2-within	0.364	0.365	0.366	0.366
R2-between	0.418	0.593	0.598	0.607
No. Obs.	1165	1137	1137	1137
No. countries	47	46	46	46

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