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DIFFERENT? EVIDENCE ON BANK
PERFORMANCE AND STRATEGY**

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Abstract

This paper provides evidence on how bank performance and strategies vary with the degree of bank internationalization using data for 113 countries over the 2000-2015 period. We investigate if international banks headquartered in developing countries behave and perform differently than those headquartered in high-income countries. Results show that compared to domestic banks, international banks have lower valuations and achieve lower returns on equity in general. This suggests on average bank internationalization has progressed beyond the point where it is in the interest of bank shareholders, potentially because of corporate governance failures and too-big-to-fail subsidies that accrue to large and complex banks. In contrast, developing country international banks seem to have benefited from internationalization compared to their high-income counterparts. Furthermore, for international banks headquartered in developing countries, bank internationalization reduces the cyclicity of their domestic credit growth with respect to domestic GDP growth, smoothing out local downturns. In contrast, if the international bank is from a high-income country investing in a developing country, its lending is relatively procyclical, which can be destabilizing.

JEL Classification: F36, G21, G28

Keywords: Bank internationalization, south-south banking, risk-taking, procyclicality

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1. Introduction

Historically, banks have increased their geographical reach following their customers abroad in search of new profit opportunities. The decade before the 2007–09 global financial crisis was characterized by a significant increase in financial globalization, particularly for banking institutions, that coincided with increases in bank size to unprecedented levels. These changes were manifested in both a rise in cross-border lending and further internationalization of the banks themselves.

This globalization trend has been partially reversed by a recent retrenchment of international banks that are headquartered in high-income countries. Going against this trend, however, many developing country banks have expanded internationally, in part to fill the gaps left by high-income country international banks (World Bank, 2018).¹

In this paper, we examine the implications of bank internationalization for the banks themselves, and for their credit provision. We use bank-level information from Bankscope, for 113 countries over the 2000-2015 period. Specifically, we consider how bank internationalization is related to a set of bank-level variables that are indicative of bank valuation, risk, and return, and also to a range of variables that reflect the business model and funding strategies of banks. In addition, we consider how bank internationalization affects the cyclicity of an international bank's credit provision in its home country as well as in any foreign country where it has a subsidiary. Importantly, given the recent expansion of international banks from developing countries, we also examine whether these banks behave and perform differently compared to those international banks headquartered in high-income countries.

¹ Alade (2014) reports that by the end of 2008 more than half of domestically owned Nigerian banks owned at least one foreign subsidiary – mostly in Africa – compared to two in 2002.

We measure bank internationalization in two alternative ways: by the share of a bank's overall liabilities contracted by its foreign subsidiaries, or by the number of foreign host countries where the bank operates at least one subsidiary. Our sample of banks contains 2,793 banks in total, of which 325 banks are international with at least one foreign subsidiary. As seen in Figure 1, the average asset growth rate of international banks was relatively high compared to domestic banks in the years 2005-2008 leading up to the global financial crisis, while it has been comparable to that of domestic banks since the crisis. 2015 figures capture the significant retrenchment of international banks relative to domestic banks.

We find that bank internationalization generally has been associated with lower bank valuation as measured by Tobin's Q and the market-to-book value of equity for the 2000-2013 period, in part reflecting a lower return on equity. Nevertheless, the performance of international banks in terms of bank valuation and non-performing loans improved after the financial crisis, potentially reflecting regulatory measures to increase capitalization and asset composition, as well as market's valuation of their revealed too-big-to-fail subsidies.

Our results suggest developing country international banks benefited relatively more from internationalization in terms of a higher valuation, lower risk, and a higher return on equity. This likely reflects the different business strategies followed by these banks and their focus on comparative expertise in terms of the countries they choose to operate in.

Overall, we find that international banks are relatively undercapitalized, potentially shifting the risk to taxpayers through their greater reliance on the safety net, due to their size and difficulty of winding down. In general, international banks also fund themselves to a lesser extent with customer deposits, indicating they often invest less in retail business models in their international business. Furthermore, they accumulate relatively few off-balance sheet exposures

and receive relatively little non-interest income. The net effect of these differences between international and domestic banks on financial fragility is unclear, as lower capitalization and deposit funding could increase bank riskiness, while lower off-balance sheet exposures and a lower share of non-interest income could reduce risk.

Going beyond the implications of bank internationalization for the banks themselves, we also examine how this affects the cyclicity of credit growth with respect to GDP growth. We see that bank internationalization reduces the cyclicity of domestic credit growth with respect to domestic GDP growth, potentially because international banks repatriate some funding to their home country during economic downturns to be able to continue lending domestically. This stabilizing effect is particularly strong for international banks headquartered in developing countries. A different pattern emerges when we investigate the cyclicity of the international bank lending in the foreign subsidiary countries. We find that developing country lending of international banks headquartered in high-income countries is relatively procyclical, although this effect is not significant if the international bank is also headquartered in a developing country. This enhanced procyclicality of credit growth in developing countries suggests that high-income international bank operations can be potentially destabilizing, while this is not true for south-south bank lending, i.e., developing country international banks doing business in other developing countries.

In this paper, we investigate the performance and impact of international banks using consolidated bank data. Using consolidated data in analyzing the performance of international banks is important because a bank's consolidated income statement is impervious to potential misrepresentation at the subsidiary level on account of international profit shifting motivated by international tax rate differences, which is common in the banking sector (see for example

Huizinga et al., 2014, and Merz and Overesch, 2016). Furthermore, international banks tend to be evaluated by capital markets at the consolidated level, and they primarily fail at the consolidated level (Anginer et al., 2017).

Nevertheless, a voluminous literature investigates international banks by focusing on the performance of foreign-owned banks that typically are subsidiaries of multinational banks. Claessens and Van Horen (2012) provide an overview of 35 studies in this area in their Table 1 demonstrating how the results of various empirical studies differ -mostly depending on the sample of banks and the data that are used. In their own analysis, they find that the performance of foreign banks in the pre-crisis period compared to domestic banks depends on a range of factors including the particular home country, host-country regulations, and language similarity. A separate approach is to investigate the impact of foreign bank presence, i.e., the share of foreign banking in total banking, on local banking markets.² An early contribution in this area is Claessens, Demirgüç-Kunt, and Huizinga (2001) who consider the impact of foreign bank presence on several key performance indicators of the local banking market such as the return on assets and overhead relative to assets. A recent contribution along these lines is Claessens and Van Horen (2014) who examine the impact of foreign bank presence on private credit growth and again document the relevance of host country and banks' characteristics.

However, there is a relatively small literature investigating the performance and impact of international banks using data at the consolidated level. Garcia-Herrero and Vazquez (2013) document higher risk-adjusted returns for international banks located in eight high-income countries mainly on account of their subsidiaries in developing countries. More recently, analyzing pre-crisis data for 56 countries Gulamhussen et al. (2017) find that international

² See Cull and Martinez Peria (2010) for a survey of the literature on the drivers and consequences of foreign bank participation in developing countries.

diversification creates excess shareholder value, especially for banks expanding towards less developed countries. Using US data, Berger et al. (2016) find that international banks tend to be riskier – confirming earlier findings by Gulamhussen et al. (2014) for an international sample of banks in the period preceding the global financial crisis. Buch et al. (2013) show that higher internationalization at the extensive margin (asset holdings in more countries) is associated with lower domestic market power, whereas higher internationalization at the intensive margin (a higher foreign assets share) is positively associated with market power. Buch et al. (2011, 2014) analyze the drivers of German banks' internationalization, showing the importance of bank characteristics such as productivity and risk aversion. Using the same German data, Galema et al. (2013) conclude that cost advantages are driving bank internationalization through foreign branches, but not in the case of foreign subsidiaries. Using data for 84 countries, Bertay, Demirgüç-Kunt, and Huizinga (2016) find that bank internationalization is positively associated with a bank's average funding cost, possibly reflecting creditors' fears of not being repaid in case of a bank failure.

De Haas and Van Lelyveld (2014) compare the credit growth responses of domestic banks and multinational unconsolidated parent banks (but not the multinational consolidated parent banks) to the global financial crisis, taking into account the share of a multinational bank's assets located at foreign subsidiaries.³ They show that during the global financial crisis subsidiaries in foreign host countries could rely less on parent banks compared to earlier crises, and that parent banks reduced their lending less in the home country compared to their domestic counterparts -thanks to their liquid foreign subsidiaries.

³ Their dataset contains 48 large multinational banking groups almost entirely from high-income countries (there are only two developing country banks from Brazil).

Our paper adds to this literature on the operation of international banks at the consolidated level. Importantly, by compiling a large dataset covering both high-income and developing countries, we are able to document the implications of bank internationalization for bank performance, bank strategy, and credit cycles separately for banks headquartered in developing countries as compared to high-income countries. The potential differences between international banks from developing and high-income countries came to the fore in policy discussions with the rise of international banks from developing countries after the global financial crisis (World Bank, 2018). The pros and cons of this development are starting to be debated in academic and policy circles alike. Our analysis hopes to start shedding light on these critical questions.

Section 2 presents the data and discusses the empirical methodology used in this study. Section 3 presents the empirical results. Consecutive subsections address how bank internationalization is related to measures of bank valuation, risk, and return, indices of bank business models and funding strategies, and the cyclicity of credit growth. Section 4 concludes.

2. Data and methodology

2.1 Data

In this paper, we examine how a bank's degree of internationalization is related to a range of bank performance and strategy variables. Using Bankscope, we construct a sample of domestic as well as international banks headquartered in 113 countries during the 2000-2015 period. This data source provides us with income and balance sheet information on these banks, and also with information on their ownership relationships. In the case of international banks,

this information enables us to ascertain the number, sizes and country locations of the bank's foreign subsidiaries.

Using the ownership data, we construct two alternative indices of bank internationalization. First, we consider the extent to which a bank's overall funding is obtained through its foreign subsidiaries. Specifically, following Bertay, Demirgüç-Kunt, Huizinga (2016) we construct Foreign liabilities as the ratio of the sum of all foreign subsidiaries' liabilities (weighted by the parent bank's ownership share) to the consolidated liabilities of the parent bank.⁴ From Table 1, we see that the average Foreign liabilities ratio is 2.6% for the overall sample, while it is 14.5% for the sample of international banks that have at least one foreign subsidiary. As can be seen in Figure 2, the Foreign liabilities ratio for the average international bank has been fluctuating, falling from pre-crisis peak of 16.2% in 2006 to below 14% in 2010, only to increase to 16.4% in 2012, before subsequently falling back to 13.4% with retrenchment in 2015.

As an alternative internationalization measure, we consider the number of an international bank's foreign host countries (in the empirical work we use the variable Countries, which is the log of this number). The average bank operates in 0.9 foreign host countries, while the average international bank is present in 4.6 foreign countries. Figure 3 shows that the average number of foreign host countries doubled from 5.1 in 2009 to 11.1 in 2015.

We relate the two measures of bank internationalization to a range of bank performance variables that represent bank's valuation, risk and return. To start, Tobin's Q is a proxy for the market value of the bank's assets relative to their book value. It is constructed as the sum of the market value of common equity plus the book value of preferred equity and liabilities, divided by

⁴ The correlation between Foreign liabilities and Foreign assets is very high at 0.99.

the book value of total assets. Tobin's Q has a mean value of 1.03. Figure 4 shows the time trends of Tobin's Q separately for domestic and international banks. We see that the average Tobin's Q of domestic banks is relatively high compared to international banks during 2001-2006, while it is lower for domestic banks than international banks from 2007 onwards. This suggests that the financial crisis has led to a revaluation of international banks compared to domestic banks, potentially because international banks received relatively generous bail-outs during the crisis.

As an alternative valuation variable, the market-to-book ratio is computed as the market value of common equity divided by its book value, with a mean value of 1.30. Figure 5 shows qualitatively similar patterns of the market-to-book ratios of domestic and international banks as for Tobin's Q in Figure 4.

We also consider two indices of bank risk. First, the Z-score is constructed as the log of the sum of the mean return on assets and the mean ratio of equity to assets divided by the standard deviation of the return on assets to measure bank solvency. The Z-score indicates the number of standard deviations that a bank's return on assets can decline before the bank reaches insolvency. A higher Z-score indicates a lower probability of bank failure. In Figure 6, we see that the average Z-score of international banks has been lower compared to domestic banks throughout the 2000-2015 period, indicating a higher probability of insolvency for international banks. As a second proxy for bank risk, we construct the NPL variable as the log of the ratio of nonperforming loans to gross loans + 1. Figure 7 displays the raw NPL ratio, showing that international banks have tended to have higher NPL ratios than domestic banks, which suggests that they make riskier loans on average.

To measure bank profitability, we use ROA, the return on assets computed as pre-tax profits divided by total assets, with a mean of 1.0%. In Figure 8, we see that international banks have achieved a lower average ROA than domestic banks recently in 2014 and 2015.

Alternatively, ROE is the return on equity, which is constructed as the ratio of pre-tax profits to equity. Figure 9 shows that the return on equity has tended to be higher for international banks than for domestic banks, but it was lower during 2015.

Differences in bank performance between domestic and international banks can reflect variation in business models and strategic behavior. In the empirical work, we consider 6 variables that are indices of a bank's funding and income strategies. First, on the funding side *Equity* is constructed as the ratio of equity to total assets with a mean of 10.0%. As a second funding variable, *Deposit and short-term funding* is the share of customer deposit and other short-term funding in total liabilities, proxying for the extent to which a bank attracts short-term funding from its customers as well as the market. The *Deposit and short-term funding* variable has a mean of 83.2%. Third, to reflect the bank's asset allocation, *Off-balance sheet items* is the value of the assets that the bank does not control, but where it may have some exposure to losses, relative to total assets. *Off-balance sheet items* reflect a risky bank allocation strategy if they are not fully reflected in a bank's risk-weighted assets as used for capital regulatory purposes. The *Off-balance sheet items* variable has a mean of 15.0%. Fourth, to reflect the bank's income strategy, *Net interest margin* is constructed as net interest income divided by total assets with a mean value of 3.2%. A relatively low interest margin, among other things, can reflect that a bank focuses on providing credits to relatively large customers that tend to negotiate lower interest rates. Fifth, *Non-interest income* is the share of a bank's non-interest income, comprising fee income and trading income, in total operating income. Demirgüç-Kunt and Huizinga (2010) find

that banks that focus more on generating non-interest income tend to be riskier. The average non-interest income share is 33.1%. As a final behavioral variable, *Overhead* is computed as non-interest expenses divided by total assets, with a mean value of 3.0%. The overhead variable reflects the composition of a bank's activities as well as its efficiency.

Credit provision is a key aspect of a bank's overall activities that is potentially affected by its degree of internationalization. To examine this, we construct the *Loan growth, consolidated* variable as the rate of credit growth of the consolidated parent bank, reflecting loan growth at the parent firm itself as well as at all its domestic and foreign subsidiaries. *Loan growth-consolidated* has a mean of 9%. In contrast, *Loan growth, unconsolidated* is the rate of credit growth at the unconsolidated parent bank. This variable should mostly reflect domestic credit growth (although it could reflect growth in cross-border loans). *Loan growth, unconsolidated* has a mean of 8.6%. *Loan growth subsidiary, consolidated* in turn is the rate of loan growth at a subsidiary (domestic or foreign) based on the subsidiary's consolidated balance sheet with a mean value of 6.9%. Finally, *Loan growth subsidiary, unconsolidated*, is the rate of loan growth at a subsidiary as reflected in the subsidiary's unconsolidated balance sheet with a mean value of 6.7%.

The analysis includes several additional variables as controls variables. *Assets*, denoting the log of total assets, is a bank-level control variable. Furthermore, *Loans* is a bank's gross loans divided by total assets with a mean of 58.8%. Finally, there are three macroeconomic control variables: the rate of consumer price inflation, the rate of real GDP growth, and per capita GDP.

2.2 Methodology

Empirically, we relate bank performance, strategy and credit growth variables to the two alternative indices of bank internationalization. The basic estimating relationship between a bank performance or strategy variable and an index of bank internationalization is as follows:

$$Y_{ijt} = \alpha_i + \gamma_t + \beta_1 Inter_{ijt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \varepsilon_{ijt} \quad (1)$$

where the subscripts i , j , and t denote the bank, the country, and the year. Y_{ijt} is a bank performance or strategy variable. $Inter_{ijt}$ is a bank internationalization variable (either *Foreign liabilities* or *Countries*). $Bank_{ijt}$ denotes lagged bank-level control variables, and $Macro_{jt}$ represents macroeconomic control variables. Finally, α_i and γ_t are bank and year fixed effects.

Ex-ante, internationalized banks may display different performance and adopt different strategies as they face different business opportunities and operate in different institutional environments. Internationalization, for instance, may provide banks with additional asset and income diversification opportunities that improve their risk-and-return tradeoff. If so, bank internationalization is expected to be positively associated with bank valuation (Tobin's Q and Market-to-book), negatively associated with bank risk (i.e., positively related to Z-score and negatively related to NPL), and positively associated with bank return (ROA and ROE). Also, internationalized banks may have the advantage that they are too complex to wind down, which could provide them with a funding advantage (Bertay, Demirgüç-Kunt, and Huizinga, 2016) and could enable them to operate with relatively little equity. Conversely, international banks may face information barriers in foreign banking markets, and they may be confronted by a lack of trust in these markets, which could restrict their ability to raise deposits locally or to engage in

information-intensive activities such as accumulating off-balance sheet exposures or engaging in non-interest income generating activities.

The relationships between bank performance and strategy variables, on the one hand, and bank internationalization, on the other, could vary with the level of economic development of the bank's parent country, and they could vary over time. To investigate this, we estimate the following specification:

$$\begin{aligned}
 Y_{ijt} = & \alpha_i + \gamma_t + \beta_1 Inter_{ijt} + \beta_2 Inter_{ijt} \times Developing_j + \beta_3 Inter_{ijt} \times After\ 2006_t + \\
 & \beta_4 Inter_{ijt} \times Developing_j \times After\ 2006_t + \beta_5 Developing_j \times After\ 2006_t + \\
 & \beta_6 Bank_{ijt} + \beta_7 Macro_{jt} + \varepsilon_{ijt}
 \end{aligned} \tag{2}$$

where *Developing_j* is a dummy variable signaling that a bank is located in a low-income or middle-income country, and *After 2006_t* is a dummy variable for the years after 2006 (comprising the financial crisis and its aftermath).

The internationalization strategies of banks located in developing countries may differ in that they expand more into countries with similar levels of development that are in relatively close proximity. If so, internationalization may improve the performance of developing country banks relatively more compared to banks located in high-income countries. Furthermore, international banks may perform relatively well following the financial crisis, as their capitalization and asset composition may have improved responding to regulatory changes and their market capitalization may reflect their too-big-to-fail subsidies as revealed by their ability to draw on the financial safety net during the crisis.

Finally, we examine whether the cyclicity of a bank's loan growth is affected by its degree of internationalization. To this end, we estimate the following relationship:

$$\begin{aligned} \text{Loan growth}_{ijt} = & \alpha_i + \gamma_t + \beta_1 \text{Inter}_{ijt} + \beta_2 \text{Inter}_{ijt} \times \text{GDP growth}_{jt} + \\ & \beta_3 \text{Bank}_{ijt} + \beta_4 \text{Macro}_{jt} + \varepsilon_{ijt} \end{aligned} \quad (3)$$

where GDP growth_{jt} is the rate of GDP growth of the bank's parent country. Less cyclicity of a multinational's loan growth in the parent country with respect to parent-country GDP growth is consistent with finding $\beta_2 < 0$, and vice versa. Credit growth in the bank's parent country may be less cyclical with respect to parent-country GDP growth, if lower parent-country GDP growth (resulting in higher losses on the domestic loan portfolio) enables the bank to continue lending domestically by relocating funding from its foreign subsidiaries to the parent bank. We examine these relationships for developing and high-income country international banks, investing in other developing or high-income countries, looking for potentially different patterns of association.

3. Empirical results

3.1 Bank performance and internationalization

Table 2 shows evidence on how the bank valuation, risk, and return variables vary with bank internationalization from estimating specification 1 in section 2.2. The regressions in columns 1-6 and 7-12 include the foreign liabilities ratio variable and the countries variable, respectively. In the Tobin's Q regression 1, the foreign liabilities variable obtains a negative coefficient of -0.064 that is significant at 10%, while in the Market-to-book regression 2 this

variable obtains a negative coefficient of -0.535 that is significant at 1%. These results suggest bank internationalization on average is associated with lower bank valuation. In the ROE regression 6, *Foreign liabilities* enters with a negative coefficient of -0.039 that is significant at 10%. Similarly, in the ROE regression 12 the countries variable is estimated with a negative coefficient of -0.041 that is significant at 5%. Overall, the evidence of Table 2 indicates that internationalization has tended to reduce bank valuation in part on account of a lower return on equity.

These results suggest that overall, bank internationalization has progressed beyond the point where it is in the interest of bank shareholders, potentially because of corporate governance failures influencing manager incentives and too-big-to-fail subsidies (see Anginer et al., forthcoming).

Next, we consider whether the relationships between bank performance variables and bank internationalization are different for banks headquartered in developing countries, and whether these relationships have been affected by the financial crisis in line with specification 2 in section 2.2. The regressions reported in Panel A of Table 3 include the foreign liabilities ratio variable, while the regressions in Panel B include the countries variable.

In the Tobin's q regression 2 of Panel A, the interaction *Foreign liabilities * After 2006* is estimated to be positive and significant at 1%, which suggests that internationalization reduces bank valuation less following the financial crisis, perhaps because of regulatory-induced improvements after the crisis, as well as too-big-to-fail subsidies which were revealed by the ability of international banks to draw on the financial safety net during the crisis. In the market-to-book regression 4, similarly the interaction *Foreign liabilities * After 2006* is estimated with a positive and significant coefficient. In this regression, the variable *Foreign liabilities **

Developing receives a positive and significant coefficient of 2.551 while the triple interaction Foreign liabilities * Developing * After 2006 receives a negative and significant coefficient of -2.615. This suggests that internationalization added relatively more to the valuation of developing country banks, but that this advantage was lost following the crisis. In the NPL regression 8, the interaction Foreign liabilities * After 2006 is estimated with a negative and significant coefficient of -0.010, which suggests that internationalized banks had relatively low NPL ratios following the crisis, perhaps because they held relatively well-diversified loan portfolios. Overall, the results of Panel A of Table 3 suggest that internationalized banks suffered relatively little from the crisis in terms of their valuation as well as their NPL ratio.

In Panel B of Table 3, we see that the interaction Countries *Developing enters with positive and significant coefficients in the Market-to-book ratio regression 3, the Z-score regression 5, and the ROE regression 11, while it enters with a negative and significant coefficient in the NPL ratio regression 7. Together these results suggest that internationalization creates benefits for especially banks headquartered in developing countries in terms of higher valuation and ROE, and lower bank risk (as measured by both the Z-score and the NPL ratio). The interaction variable Countries * After 2006, in turn, is positive and significant in the Tobin's Q regression 2, the Market-to-book regression 4, the Z-score regression 6, the ROA regression 10, and it is negative and significant in the NPL ratio regression 8. The picture that emerges from these results is that internationalization served banks relatively well following the crisis in terms of valuation, their ROA as well as their risk (as measured by both the Z-score and the NPL ratio).

Overall, the results of Table 3 show that bank internationalization has conferred performance benefits to bank especially if headquartered in developing countries and following the crisis. International banks can not only be distinguished by whether their headquarters are

located in a developing country or not, but also by whether their foreign activities take place in developing countries. To take the location of an international bank's activities into account, we split the Foreign liabilities variable into two separate variables reflecting liabilities contracted in high-income and developing countries, respectively. Similarly, we constructed two separate countries variables as the logs of the numbers of a bank's foreign host countries among high-income vs. developing countries. In unreported regressions analogous to Table 3, we find that banks located in high-income countries had lower (higher) valuations if their foreign activities took place in high-income (developing) countries (whether measured by foreign liabilities or countries variables). The tendency for high-income country international banks with foreign activities in other high-income countries to receive lower valuations, however, was mitigated following the crisis.⁵

3.2 Bank strategies and internationalization

In this subsection, we analyze how bank internationalization is associated with a range of variables that are indicative of bank funding and income strategies. In Table 4, regressions 1-6 relate these variables to the foreign liabilities ratio, while regressions 7-12 relate them to the countries variable.

Regression 1 of Table 4 shows that the equity varies negatively and significantly with foreign liabilities, providing evidence that internationalized banks tend to be less well capitalized. This could reflect a greater expectation on the part of internationalized banks of being bailed out in case of distress. In regression 2, the deposit and short-term funding ratio is shown to be significantly lower for banks with higher foreign liabilities, perhaps because international banks find it more difficult to raise deposits in foreign banking markets. The

⁵ In contrast, for developing country banks we did not find a clear differential valuation effect depending on whether they operate in foreign high-income countries or foreign developing countries.

relatively low deposit share in international banks' funding could make their funding less stable. In regressions 9 and 11, we see that the off-balance sheet items and the non-interest income share variables are negatively and significantly related to the countries variable. Internationalized banks may acquire fewer off-balance sheet exposures and engage less in non-interest income generating activities on account of their informational disadvantages in conducting non-standard banking activities, which may reduce their riskiness.

Overall, the lower capitalization and deposit funding of internationalized banks suggest they have relatively risky business models, while the lower off-balance sheet items and non-interest income share point in the opposite direction.

In Table 5 we examine how the differential strategies of international banks depend on the location of the parent bank and on the time period. In the equity regression 2 of Panel A, the Foreign liabilities * Developing variable enters negatively and significantly, suggesting that the lower capitalization of internationalized banks is a developing country phenomenon. In the deposits share regression 4, Foreign liabilities * After 2006 and Foreign liabilities * Developing * After 2006 obtain significant coefficients of -0.057 and 0.143, respectively, suggesting that internationalized banks started to have a relatively low deposit funding share following the crisis, but not in developing countries. From regressions 6 and 10, we see that the lower off-balance sheet exposures and non-interest income share of internationalized banks can be attributed to the crisis period and its aftermath.

In Panel B, the negative and estimated coefficients for the Countries * After 2006 coefficients in the deposit and short-term funding regression 4, the off-balance sheet items regression 6, and the non-interest income regression 10 suggest internationalized banks started to have lower values of these respective variables following the crisis. Positive and significant

coefficients for the Countries * Developing * After 2006 variables in regressions 4 and 6, however, suggest that banks in high-income countries, rather than developing countries, started to adopt different deposit funding shares and off-balance sheet exposures compared to domestic banks following the crisis.

3.3 The cyclicalty of credit and internationalization

A potential benefit of bank internationalization is that it reduces the cyclicalty of credit in individual countries to their respective business cycles. In this subsection, we consider the relationship between bank internationalization and the cyclicalty of bank loans following specification 3 in section 2.2. In turn, we consider the cyclicalty of loans at the level of the parent bank with respect to parent-country GDP growth, and the cyclicalty of loans at subsidiary banks with respect to GDP growth in subsidiary countries.

Regressions 1 and 2 of Table 6, the dependent variable is the credit growth rate of the parent bank at the consolidated level. In regression 2, the triple interaction Foreign liabilities * GDP growth * Developing receives a negative and significant coefficient of -0.048, which suggests that greater internationalization of banks located in developing countries reduces the sensitivity of loans to their countries' GDP growth rate. In regressions 3-4, the dependent variable is parent-bank loan growth at the unconsolidated level, excluding domestic and foreign subsidiaries. This variable is a more direct measure of the growth rate of a bank's credit domestically. In regression 3, the negative and significant coefficient for the Foreign liabilities * GDP growth variable of -0.022 suggests that the sensitivity of a bank's loan growth at the unconsolidated level to parent-country GDP growth declines with its degree of internationalization. The negative and significant coefficient for the triple interaction Foreign liabilities * GDP growth * Developing in regression 4 suggests that this is especially the case for

developing country banks. The negative and significant coefficients for the triple interactions terms involving the countries variable in regressions 6 and 8 are consistent with this. Overall, Table 6 provides evidence that bank internationalization of banks tends to make loan provision in their home countries less sensitive to home-country GDP growth. This could reflect that domestic GDP growth has a relatively small impact on firm-wide loan losses, and hence capitalization, for internationalized banks, which would mitigate the impact of domestic loan losses on international banks' abilities to provide new loans domestically.

The estimated coefficients of regression 6 in Table 6 can be used to illustrate the credit growth impact associated with a 1% higher GDP growth rate depending on the bank's degree of internationalization and its location. In particular, we compare credit growth at a domestic bank to credit growth at an average international bank that has a log number countries, in which the bank is active, variable equal to its mean. Both of these banks are taken to be located either in a developing country or a high-income country. As seen in Figure 10, a higher GDP growth rate of 1% has impacts of 0.60% and 0.90% on the credit growth rates of domestic and international banks, respectively, if they are located in a high-income country. In contrast, the calculated credit growth rate of a domestic bank (1.50%) is substantially higher than for an international bank (0.32%), if both banks are located in a developing country. These results confirm a lower procyclicality of credit provision by international banks headquartered in developing countries.

To conclude this section, we address the cyclicity of loan growth to local GDP growth from the perspective of the banks' host countries. Analogously to Table 6, we consider loan growth of subsidiary banks both at the consolidated and unconsolidated levels in Table 7.⁶ In addition, we consider a sample split between subsidiaries located in high-income host countries

⁶ Subsidiary bank loan growth at the unconsolidated level should be a relatively good measure of loan growth in the host country.

(in regressions 1 and 2), and subsidiaries located in developing host countries (in regressions 3 and 4). In regressions 3 and 4 (concerning loan growth at the consolidated and unconsolidated levels, respectively, for subsidiaries located in developing countries), we find positive and significant coefficients for interaction variables of host country GDP growth and a dummy variable signaling that the bank's home country is a high-income country.⁷ Thus, host-country credit growth is relatively procyclical with respect to host-country GDP growth for banks located in developing countries, if their parent bank is headquartered in a high-income country. Such an enhanced procyclicality of credit provision by international banks in developing countries can come about if a higher GDP growth rate in a developing country causes the high-income parent bank to channel additional funds to the developing country to meet the greater loan demand. This is potentially destabilizing for the economy of the developing country.

4. Conclusion

This paper adds to a relatively small literature that considers the performance of international banks at the consolidated level. We use consolidated bank-level data in 113 countries to investigate if international banks headquartered in developing countries behave and perform differently compared to those headquartered in high-income countries. These differences became important with the rise of international banks from developing countries after the global financial crisis, and the pros and cons of this expansion are starting to be debated in academic and policy circles.

Our empirical results suggest that bank valuation has varied negatively with a bank's degree of internationalization in general. Hence, on average, bank internationalization has

⁷ Bertay, Demirgüç-Kunt, and Huizinga (2015) find that the credit growth of foreign subsidiaries is more procyclical with local GDP growth than the credit growth of domestic banks.

progressed beyond the point where it is in the interests of bank shareholders, potentially because of corporate governance failures that have enabled bank managers to engage in international bank empire building, also to take advantage of perceived too-big-to-fail subsidies that accrue to large and complex banks.

In contrast, developing country international banks seem to have benefited from internationalization compared to international banks headquartered in high-income countries. This could reflect that developing country banks have tended to expand into countries in the same region and with a similar level of economic development where they would have a true comparative advantage.

The implications of bank internationalization also vary over time. In particular, we find that international banks experienced some revaluation after 2006 following the financial crisis, potentially because of recapitalization and changes in their asset composition, as well as revaluation of their too-big-to-fail subsidies which were revealed to be large based on their ability to draw on the financial safety net during the crisis.

Furthermore, international banks are also relatively undercapitalized, rely less on deposit funding and do not engage as much in off-balance sheet or non-interest income generating activities. The net effect of these differences between international and domestic banks on financial fragility is unclear, as lower capitalization and customer funding could increase bank risk, while lower off-balance sheet exposures and a lower share of non-interest income could reduce risk.

Finally, we see that international banks headquartered in developing countries reduce the cyclicity of domestic credit growth with respect to domestic GDP growth, potentially cushioning local economic downturns. In contrast, international banks from high-income

countries can amplify the cyclicality of credit growth in developing countries when they invest there. In summary, for developing countries, internationalization of their banks can be a stabilizing force for their overall economy. However, international banks coming from high-income countries can be destabilizing for developing countries, since their lending tends to be procyclical.

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A. Data Appendix

Variable definitions and data sources

Variable	Description	Sources
Foreign liabilities	Sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities	Bankscope
Countries	Log of (number of host countries +1)	Bankscope
Tobin's Q	Sum of market value of common equity, preferred equity, and total liabilities divided by total assets	Bankscope and Datastream
Market-to-book	Ratio of market value of equity to book value of equity	Bankscope and Datastream
Z-score	Log of Z-score which is calculated as $(ROA+CAR)/stddev(ROA)$, where ROA is return on assets, CAR is the ratio of capital to assets, and $stddev(ROA)$ is the standard deviation of return on assets. It is calculated for 4-years rolling windows, normalized by total assets, and lagged one period	Bankscope
NPL ratio	Log of ratio of non-performing loans to gross loans + 1	Bankscope
ROA	Ratio of pre-tax profits to total assets	Bankscope
ROE	Ratio of pre-tax profits to equity	Bankscope
Equity	Ratio of equity to total assets	Bankscope
Deposit and ST funding	Share of customer deposit and other short-term funding in total liabilities	Bankscope
Off-balance sheet items	Ratio of assets that the bank does not control but where it may have some exposure to losses to total assets	Bankscope
Net interest margin	Interest income minus interest expense divided by total assets	Bankscope
Non-interest income	Ratio of non-interest income to total operating income	Bankscope
Overhead	Personnel expenses and other non-interest expenses divided by total assets	Bankscope
Loan growth, consolidated	Growth rate of loans from the parent bank's consolidated balance sheet	Bankscope
Loan growth, unconsolidated	Growth rate of loans from the parent bank's unconsolidated balance sheet	Bankscope
Loan growth subsidiary, consolidated	Growth rate of loans from a subsidiary bank's consolidated balance sheet	Bankscope
Loan growth subsidiary, unconsolidated	Growth rate of loans from a subsidiary bank's unconsolidated balance sheet	Bankscope
Assets	Log of total assets in constant 2010 dollars	Bankscope
Loans	Ratio of loans to total assets	Bankscope
Inflation	Rate of annual change in consumer prices	Bankscope
Developing	Dummy variable that is one for a bank located in a low-income or middle-income country according to World Bank classification, and zero otherwise.	Bankscope
Inflation	Consumer price inflation rate	WDI
GDP growth	Rate of real per capita GDP growth	WDI
GDP per capita	GDP per capita in thousands of constant 2000 dollars	WDI

Construction of the bank sample

We construct the data set by combining three modules from Bankscope. The Financials module discloses balance sheet information, and has been applied frequently in past empirical literature. The Ownership and Subsidiary modules provide information on the equity structure of banks, their subsidiaries, and participatory affiliates. In constructing the data set, we had to meet three major challenges.

First, to ensure entities at every level are coded properly, we used identifiers including Bureau van Dijk ID (bvdid), the Bankscope index, and the bank name jointly to organize financial and ownership statements. The primary purposes of bvdid and the index are to track banks and related financial statements at different consolidation levels. However, over the period of 2000-2015 the published identifiers have exhibited changes that confound direct identification. Exploiting the fact that multiple bvdids can refer to one banking entity through the same financial statement index number (and vice versa), we conducted a pre-identification network analysis to connect groups of bvdids sharing any indices in any year, and adjusted for bank name overlaps to create standardized identifiers for analysis. This exercise groups the 50987 bank bvdids into 33723 entities, which represent ultimate owners (UOs), intermediate entities, and lower-level subsidiaries.

Second, we adopt a systematic approach to harmonize entity links from the two connection modules as an ownership transfer may not be recorded in unison. Treating total and direct ownership link-years separately (respectively 4.4 and 2.5 million), we first retain the set of link-years that appear in the most up-to-date record. Next, we give precedence to Subsidiary module information in case of conflicts so as to maximize comparability from the shareholder perspective. For very limited remaining cases, the largest recorded shareholding value is applied to break ties. At this stage, 1.8 million total and 847 thousand direct ownership link-years remain. As Bureau van Dijk retains ownership records until a change is reported, we carry forward values from the latest year previously available, applying this principle to bridge any gaps in the panel dimension for every entity pair. This restores the number of link-years to 2.2 million and 905 thousands for total and direct ownership links, respectively.

Third, using the total shareholding positions as the basis to identify a bank's UOs, we augment it with results of a recursive algorithm that traces consecutive direct shareholding positions to UOs such as parent banks or holding companies. For each year in 2000-15, the algorithm arranges fractional direct shareholding positions into a matrix, with rows representing immediate subsidiaries and columns shareholders that have been standardized in the network analysis. To identify foreign ownership, we assume any unreported ownership is retained domestically by the entity, replacing diagonal entries with residuals so each matrix row sums up to 1. Ruling out circular ownership, each step of right-multiplication consolidates one layer of the shareholding structure. The computation attained the multiplicative limit after 8 steps, suggesting the longest ownership chain involves 9 entities.

From the pool of UO-subsidiary pairs we retained those with controlling (as opposed to participatory) ownership by banking entities, re-applied the gap connection routine to smoothen series, and attached information from the Financials module to aggregate the balance sheets of majority-owned subsidiaries in foreign jurisdictions. We use consolidated statements at the UO level and unconsolidated at subsidiary level wherever possible. The end result is 466 thousand link-years of 4,674 UOs, among which 25,777 links originate from 678 international UOs.

Table 1. Summary statistics on internationalization and other variables for the period 2000-2015

Foreign liabilities is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. Countries is log of number of host countries + 1. Tobin's Q is the sum of market value of common equity, preferred equity, and total liabilities divided by total assets. Market-to-book is ratio of market value of equity to book value of equity. Z-score is log of $(ROA+CAR)/stddev(ROA)$, where ROA is return on assets, CAR is the ratio of capital to assets, and $stddev(ROA)$ is the standard deviation of return on assets. It is calculated for 4-years rolling windows, normalized by total assets, and lagged one period. NPL ratio is log of ratio of non-performing loans to gross loans + 1. ROA is pre-tax profits divided by total assets. ROE is pre-tax profits divided by total assets. Equity is the ratio of equity to total assets. Deposit and ST funding is share of customer deposit and other short-term funding in total liabilities. Off-balance sheet items is ratio of assets that the bank does not control but where it may have some exposure to losses to total assets. Net interest margin is interest income minus interest expense divided by total assets. Non-interest income is ratio of non-interest income to total operating income. Overhead is personnel expenses and other non-interest expenses divided by total assets. Loan growth, consolidated is the growth rate of loans from the parent bank's consolidated balance sheet. Loan growth, unconsolidated is the growth rate of loans from the parent bank's unconsolidated balance sheet. Loan growth subsidiary, consolidated is the growth rate of loans from a subsidiary bank's consolidated balance sheet. Loan growth subsidiary, unconsolidated is the growth rate of loans from a subsidiary bank's unconsolidated balance sheet. Assets is the log of total assets in constant 2010 US dollars. Loans is ratio of loans to total assets. Developing is a dummy variable that is one for a bank located in a low-income or middle-income country according to World Bank classification, and zero otherwise. Inflation is the rate of annual change in consumer prices. GDP growth is the rate of real GDP growth. GDP per capita is GDP per capita in thousands of constant 2000 dollars.

Variable	Obs	Mean	Std. dev.	Min	Max
Foreign liabilities	13303	0.026	0.100	0	0.878
<i>International banks</i>	2421	0.145	0.194	0.000	0.878
Countries	13303	0.121	0.276	0	1.653
<i>International banks</i>	2421	0.592	0.328	0.301	1.653
Tobin's Q	5808	1.030	0.096	0.880	1.758
Market-to-book	5811	1.295	0.797	0.026	5.154
Z-score	11874	1.416	0.452	0.010	2.424
NPL ratio	10836	0.015	0.019	0	0.113
ROA	13303	0.010	0.016	-0.048	0.098
ROE	13166	0.109	0.128	-0.429	0.476
Equity	13268	0.100	0.089	0.019	0.786
Deposit and ST funding	13224	0.832	0.175	0.107	0.998
Off-balance sheet items	11186	0.150	0.154	0	0.737
Net interest margin	13265	0.032	0.019	0	0.129
Non-interest income	12926	0.331	0.192	0	0.957
Overhead	13254	0.030	0.029	0.002	0.236
Loan growth, consolidated	13031	0.090	0.198	-1	0.988
Loan growth, unconsolidated	12508	0.086	0.211	-1	0.995
Loan growth subsidiary, consolidated	13920	0.069	0.246	-1.000	0.993
Loan growth subsidiary, unconsolidated	13804	0.067	0.246	-1.000	0.993
Assets	13303	1.769	0.993	-0.498	3.915
Loans	13282	0.588	0.191	0.011	0.912
Developing	13303	0.121	0.326	0	1
Inflation	13303	6.928	299.696	-9.798	24411.030
GDP growth	13303	1.994	2.995	-62.076	104.487
GDP per capita	13303	40.409	17.870	0.303	110.00

Table 2. Bank internationalization and performance

The dependent variables are Tobin's Q in columns 1 and 7, Market-to-book in columns 2 and 8, Z-score in columns 3 and 9, NPL ratio in columns 4 and 10, ROA in columns 5 and 11, and ROE in columns 6 and 12. Tobin's Q is the sum of market value of common equity, preferred equity, and total liabilities divided by total assets. Market-to-book is ratio of market value of equity to book value of equity. Z-score is log of (ROA+CAR)/stddev(ROA), where ROA is return on assets, CAR is the ratio of capital to assets, and stddev(ROA) is the standard deviation of return on assets. It is calculated for 4-years rolling windows, normalized by total assets, and lagged one period. NPL ratio is log of ratio of non-performing loans to gross loans + 1. ROA is pre-tax profits divided by total assets. ROE is pre-tax profits divided by total assets. Foreign liabilities is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. Countries is log of number of host countries + 1. Assets is the log of total assets in constant 2010 US dollars. Loans is ratio of loans to total assets. Inflation is the rate of annual change in consumer prices. GDP growth is the rate of real GDP growth. GDP per capita is GDP per capita in thousands of constant 2000 dollars. Bank and year fixed effects are included. The sample period is 2000-2015. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	Tobin's Q	Market-to-book	Z-score	NPL ratio	ROA	ROE	Tobin's Q	Market-to-book	Z-score	NPL ratio	ROA	ROE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Foreign liabilities	-0.064*	-0.535***	-0.052	0.007	-0.004	-0.039*						
	(0.036)	(0.136)	(0.083)	(0.007)	(0.003)	(0.023)						
Countries							0.010	-0.040	-0.032	0.003	-0.002	-0.041**
							(0.015)	(0.150)	(0.073)	(0.003)	(0.002)	(0.017)
Assets	0.023	0.320***	0.169***	-0.008***	-0.004**	-0.024*	0.024*	0.352***	0.158***	-0.009***	-0.003	-0.018
	(0.014)	(0.120)	(0.059)	(0.003)	(0.002)	(0.015)	(0.014)	(0.116)	(0.058)	(0.003)	(0.002)	(0.014)
Equity	0.158	0.046	1.336***	-0.052***	0.019**	-0.086	0.092	-0.016	1.358***	-0.053***	0.020**	-0.090*
	(0.098)	(0.513)	(0.200)	(0.018)	(0.008)	(0.055)	(0.116)	(0.481)	(0.203)	(0.018)	(0.008)	(0.052)
Loans	0.009	0.183	0.526***	-0.010**	0.006*	0.034	0.020	0.236	0.495***	-0.009**	0.005	0.025
	(0.026)	(0.249)	(0.090)	(0.004)	(0.003)	(0.027)	(0.025)	(0.237)	(0.088)	(0.004)	(0.003)	(0.026)
Inflation	0.000*	-0.000***	0.000	-0.000	0.000***	0.000***	0.000**	-0.000***	0.000	-0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP growth	0.005***	0.044***	0.004	-0.000	0.000**	0.003**	0.006***	0.047***	0.004	-0.000*	0.000**	0.004**
	(0.001)	(0.009)	(0.003)	(0.000)	(0.000)	(0.001)	(0.001)	(0.009)	(0.003)	(0.000)	(0.000)	(0.001)
GDP per capita	-0.000	0.000	0.000***	-0.000***	0.000***	0.000***	-0.000	0.000	0.000***	-0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	5820	5822	11874	10849	13303	13166	6016	6018	12482	11355	13980	13837
R-sq	0.308	0.391	0.178	0.192	0.142	0.187	0.289	0.377	0.166	0.179	0.129	0.181

Table 3. Bank internationalization and performance: developing country banks and the financial crisis

The dependent variables are risk Tobin's Q in columns 1 and 7, Market-to-book in columns 2 and 8, Z-score in columns 3 and 9, NPL ratio in columns 4 and 10, ROA in columns 5 and 11, and ROE in columns 6 and 12. Tobin's Q is the sum of market value of common equity, preferred equity, and total liabilities divided by total assets. Market-to-book is ratio of market value of equity to book value of equity. Z-score is $\log((ROA+CAR)/stddev(ROA))$, where ROA is return on assets, CAR is the ratio of capital to assets, and $stddev(ROA)$ is the standard deviation of return on assets. It is calculated for 4-years rolling windows, normalized by total assets, and lagged one period. NPL ratio is \log of ratio of non-performing loans to gross loans + 1. ROA is pre-tax profits divided by total assets. ROE is pre-tax profits divided by total assets. Foreign liabilities is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. Developing is a dummy variable that is one for a bank located in a low-income or middle-income country according to World Bank classification, and zero otherwise. After 2006 is a dummy variable that is one for years after 2006, and zero otherwise. Countries is \log of number of host countries + 1. Assets is the \log of total assets in constant 2010 US dollars. Loans is ratio of loans to total assets. Inflation is the rate of annual change in consumer prices. GDP growth is the rate of real GDP growth. GDP per capita is GDP per capita in thousands of constant 2000 dollars. Assets, Loans, Inflation, GDP growth, and GDP per capita are included, but not reported. Panel A reports regressions that include foreign liabilities, and Panel B reports regressions that include Countries. Bank and year fixed effects are included. The sample period is 2000-2015. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

Panel A: Foreign liabilities	Tobin's Q		Market-to-book		Z-score		NPL ratio		ROA		ROE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Foreign liabilities	-0.067*	-0.128***	-0.599***	-0.916***	-0.042	-0.110	0.007	0.013	-0.004	-0.005	-0.050**	-0.024
	(0.038)	(0.034)	(0.137)	(0.150)	(0.092)	(0.159)	(0.006)	(0.008)	(0.003)	(0.003)	(0.025)	(0.033)
Foreign liabilities * Developing	0.047	0.086	1.000	2.551***	-0.050	0.193	0.001	0.008	0.000	0.002	0.059	0.073
	(0.097)	(0.125)	(0.695)	(0.949)	(0.218)	(0.281)	(0.020)	(0.021)	(0.008)	(0.012)	(0.055)	(0.079)
Foreign liabilities * After 2006		0.086***		0.477***		0.125		-0.010**		0.003		-0.025
		(0.016)		(0.128)		(0.172)		(0.005)		(0.003)		(0.031)
Foreign liabilities * Developing * After 2006		-0.070		-2.615**		-0.367		-0.010		-0.004		-0.038
		(0.224)		(1.258)		(0.265)		(0.016)		(0.011)		(0.077)
Developing * After 2006		0.084***		0.802***		0.359***		-0.018***		0.008***		0.086***
		(0.013)		(0.103)		(0.045)		(0.003)		(0.001)		(0.011)
N	5820	5820	5822	5822	11874	11874	10849	10849	13303	13303	13166	13166
R-sq	0.308	0.343	0.391	0.422	0.178	0.201	0.192	0.230	0.142	0.151	0.187	0.200

Panel B: Countries	Tobin's Q		Market-to-book		Z-score		NPL ratio		ROA		ROE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Countries	-0.000 (0.012)	-0.034** (0.015)	-0.247* (0.137)	-0.330** (0.148)	-0.110 (0.075)	-0.183* (0.097)	0.009*** (0.003)	0.010*** (0.004)	-0.003** (0.002)	-0.005** (0.002)	-0.063*** (0.018)	-0.036* (0.020)
Countries * Developing	0.078 (0.069)	0.053 (0.072)	1.529*** (0.455)	0.916 (0.592)	0.491*** (0.182)	0.107 (0.200)	-0.040*** (0.013)	-0.021 (0.013)	0.008 (0.006)	-0.001 (0.007)	0.141*** (0.051)	0.041 (0.055)
Countries * After 2006		0.036*** (0.006)		0.156** (0.064)		0.115** (0.050)		-0.004** (0.002)		0.002*** (0.001)		-0.009 (0.012)
Countries * Developing* After 2006		-0.087*** (0.032)		-0.294 (0.345)		-0.065 (0.137)		0.005 (0.008)		-0.002 (0.004)		-0.031 (0.033)
Developing * After 2006		0.100*** (0.012)		0.775*** (0.098)		0.345*** (0.054)		-0.019*** (0.003)		0.008*** (0.002)		0.092*** (0.013)
N	6016	6016	6018	6018	12482	12482	11355	11355	13980	13980	13837	13837
R-sq	0.291	0.330	0.384	0.413	0.169	0.192	0.188	0.221	0.130	0.139	0.183	0.195

Table 4. Bank internationalization and strategy

The dependent variables are Equity in columns 1 and 7, Deposit and ST funding in columns 2 and 8, Off-balance sheet items in columns 3 and 9, Net-interest margin in columns 4 and 10, Non-interest income in columns 5 and 11, and Overhead in columns 6 and 12. Equity is the ratio of equity to total assets. Deposit and ST funding is share of customer deposit and other short-term funding in total liabilities. Off-balance sheet items is ratio of assets that the bank does not control but where it may have some exposure to losses to total assets. Net interest margin is interest income minus interest expense divided by total assets. Non-interest income is ratio of non-interest income to total operating income. Overhead is personnel expenses and other non-interest expenses divided by total assets. Foreign liabilities is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. Countries is log of number of host countries + 1. Assets is the log of total assets in constant 2010 US dollars. Loans is ratio of loans to total assets. Inflation is the rate of annual change in consumer prices. GDP growth is the rate of real GDP growth. GDP per capita is GDP per capita in thousands of constant 2000 dollars. Bank and year fixed effects are included. The sample period is 2000-2015. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	Equity	Deposit and ST funding	Off-balance sheet items	Net interest margin	Non-interest income	Overhead	Equity	Deposit and ST funding	Off-balance sheet items	Net interest Margin	Non-interest income	Overhead
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Foreign liabilities	-0.016*	-0.051**	-0.040	-0.002	-0.030	-0.002						
	(0.008)	(0.026)	(0.031)	(0.002)	(0.024)	(0.004)						
Countries							-0.007	-0.029	-0.113***	0.002	-0.054***	-0.002
							(0.007)	(0.020)	(0.022)	(0.001)	(0.017)	(0.002)
Assets	-0.060***	-0.052***	-0.051***	-0.006***	-0.063***	-0.013***	-0.064***	-0.055***	-0.038**	-0.006***	-0.059***	-0.014***
	(0.011)	(0.016)	(0.019)	(0.002)	(0.016)	(0.003)	(0.011)	(0.016)	(0.018)	(0.001)	(0.015)	(0.003)
Equity		-0.176**	-0.006	0.022***	-0.057	0.030*		-0.189**	0.016	0.023***	-0.058	0.035**
		(0.081)	(0.062)	(0.006)	(0.078)	(0.015)		(0.076)	(0.060)	(0.006)	(0.074)	(0.015)
Loans	-0.022	-0.005	0.005	0.015***	-0.148***	-0.005	-0.018	-0.017	-0.003	0.014***	-0.144***	-0.003
	(0.018)	(0.029)	(0.031)	(0.002)	(0.024)	(0.004)	(0.017)	(0.030)	(0.030)	(0.002)	(0.023)	(0.004)
Inflation	0.000**	-0.000	0.000	0.000	0.000	-0.000	0.000**	-0.000	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP growth	-0.000	0.001*	0.003*	0.000	0.001	-0.000**	-0.001	0.001*	0.003**	0.000	0.001	-0.000**
	(0.000)	(0.000)	(0.002)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
GDP per capita	-0.000*	-0.000	0.000***	0.000	0.000	0.000	-0.000**	-0.000	0.000***	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	13336	13264	11219	13267	12927	13256	14018	13930	11790	13942	13568	13929
R-sq	0.055	0.060	0.112	0.106	0.053	0.046	0.060	0.057	0.102	0.095	0.051	0.052

Table 5. Bank internationalization and strategy: developing country banks and the financial crisis

The dependent variables are Equity in columns 1 and 2, Deposit and ST funding in columns 3 and 4, Off-balance sheet items in columns 5 and 6, Net-interest margin in columns 7 and 8, Non-interest income in columns 9 and 10, and Overhead in columns 11 and 12. Equity is the ratio of equity to total assets. Deposit and ST funding is share of customer deposit and other short-term funding in total liabilities. Off-balance sheet items is ratio of assets that the bank does not control but where it may have some exposure to losses to total assets. Net interest margin is interest income minus interest expense divided by total assets. Non-interest income is ratio of non-interest income to total operating income. Overhead is personnel expenses and other non-interest expenses divided by total assets. Foreign liabilities is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. Developing is a dummy variable that is one for a bank located in a low-income or middle-income country according to World Bank classification, and zero otherwise. After 2006 is a dummy variable that is one for years after 2006, and zero otherwise. Assets is the log of total assets in constant 2010 US dollars. Loans is ratio of loans to total assets. Inflation is the rate of annual change in consumer prices. GDP growth is the rate of real GDP growth. GDP per capita is GDP per capita in thousands of constant 2000 dollars. Countries is log of number of host countries + 1. Assets, Loans, Inflation, GDP growth, and GDP per capita are included, but not reported. Panel A reports regressions that include foreign liabilities, and Panel B reports regressions that include countries. Bank and year fixed effects are included. The sample period is 2000-2015. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

Panel A: Foreign liabilities	Equity		Deposit and ST funding		Off-balance sheet items		Net interest margin		Non-interest income		Overhead	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Foreign liabilities	-0.011 (0.009)	-0.008 (0.012)	-0.063** (0.031)	-0.019 (0.033)	-0.027 (0.034)	0.120* (0.062)	-0.002 (0.002)	-0.004 (0.003)	-0.037 (0.027)	0.030 (0.037)	-0.002 (0.004)	-0.007 (0.006)
Foreign liabilities * Developing	-0.025 (0.022)	-0.042* (0.022)	0.062 (0.045)	-0.033 (0.055)	-0.065 (0.075)	-0.180* (0.101)	-0.003 (0.008)	-0.010 (0.013)	0.036 (0.061)	0.035 (0.101)	-0.001 (0.010)	0.001 (0.010)
Foreign liabilities * After 2006		-0.003 (0.010)		-0.057** (0.026)		-0.200*** (0.075)		0.003 (0.003)		-0.093** (0.045)		0.006 (0.008)
Foreign liabilities * Developing *After 2006		0.027 (0.021)		0.143*** (0.053)		0.144 (0.103)		0.012 (0.012)		-0.020 (0.104)		-0.001 (0.012)
Developing *After 2006		0.009* (0.005)		0.003 (0.010)		-0.015 (0.015)		0.003* (0.002)		-0.029** (0.013)		-0.004*** (0.001)
N	13336	13336	13264	13264	11219	11219	13267	13267	12927	12927	13256	13256
R-sq	0.055	0.056	0.060	0.062	0.112	0.118	0.106	0.112	0.053	0.058	0.046	0.049

Panel B: Countries	Equity		Deposit and ST funding		Off-balance sheet items		Net interest margin		Non-interest income		Overhead	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Countries	-0.006 (0.006)	-0.001 (0.007)	-0.044** (0.021)	0.003 (0.022)	-0.141*** (0.024)	-0.003 (0.026)	0.001 (0.001)	-0.001 (0.002)	-0.057*** (0.018)	0.011 (0.017)	-0.001 (0.002)	-0.000 (0.002)
Countries * Developing	-0.009 (0.032)	-0.046 (0.032)	0.096* (0.050)	0.043 (0.053)	0.155*** (0.057)	0.048 (0.062)	0.004 (0.005)	0.002 (0.005)	0.019 (0.053)	-0.006 (0.047)	-0.006 (0.007)	-0.004 (0.008)
Countries * After 2006		-0.001 (0.003)		-0.040*** (0.011)		-0.121*** (0.015)		0.003*** (0.001)		-0.063*** (0.014)		-0.001 (0.001)
Countries * Developing* After 2006		0.025* (0.013)		0.053** (0.026)		0.116*** (0.040)		-0.003 (0.004)		0.055 (0.038)		0.002 (0.004)
Developing * After 2006		0.009 (0.007)		-0.010 (0.011)		-0.035** (0.017)		0.004** (0.002)		-0.038*** (0.014)		-0.003* (0.002)
N	14018	14018	13930	13930	11790	11790	13942	13942	13568	13568	13929	13929
R-sq	0.060	0.063	0.059	0.063	0.104	0.121	0.095	0.102	0.052	0.062	0.052	0.053

Table 6. Bank internationalization and the cyclicity of lending

The dependent variable is Loan growth, consolidated in columns 1-2 and 5-6, and Loan growth, unconsolidated in columns 3-4 and 7-8. Loan growth, consolidated is the growth rate of loans from the bank's consolidated balance sheet. Loan growth, unconsolidated is the growth rate of loans from the bank's unconsolidated balance sheet. Foreign liabilities is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. GDP growth is the rate of real GDP growth. Developing is a dummy variable that is one for a bank located in a low-income or middle-income country according to World Bank classification, and zero otherwise. Countries is the log of number of host countries + 1. Assets is the log of total assets in constant 2010 US dollars. Equity is the ratio of equity to total assets. Loans is ratio of loans to total assets. Inflation is the rate of annual change in consumer prices. GDP per capita is GDP per capita in thousands of constant 2000 dollars. Bank and year fixed effects are included. The sample period is 2000-2015. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	Loan growth, consolidated		Loan growth, unconsolidated		Loan growth, consolidated		Loan growth, unconsolidated	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign liabilities	-0.007 (0.046)	-0.045 (0.047)	0.007 (0.085)	-0.046 (0.106)				
Foreign liabilities * GDP growth	-0.012 (0.010)	0.003 (0.009)	-0.022* (0.012)	-0.004 (0.014)				
Foreign liabilities * Developing		0.227 (0.156)		0.297* (0.172)				
Foreign liabilities * GDP growth * Developing		-0.048** (0.022)		-0.056** (0.022)				
Countries					-0.045 (0.029)	-0.093*** (0.029)	-0.000 (0.039)	-0.024 (0.042)
Countries * GDP growth					-0.005 (0.005)	0.005* (0.003)	-0.007 (0.005)	0.004 (0.004)
Countries * Developing						0.328*** (0.088)		0.170* (0.096)
Countries * GDP growth * Developing						-0.025*** (0.005)		-0.023*** (0.006)
GDP growth * Developing		0.003 (0.003)		0.004 (0.003)		0.009*** (0.003)		0.009** (0.004)
GDP growth	0.006** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.008*** (0.002)	0.006*** (0.002)	0.008*** (0.002)	0.007*** (0.002)
Assets	-0.247*** (0.023)	-0.243*** (0.023)	-0.218*** (0.024)	-0.214*** (0.024)	-0.234*** (0.024)	-0.233*** (0.024)	-0.213*** (0.025)	-0.209*** (0.025)
Equity	0.103 (0.137)	0.102 (0.135)	0.163 (0.143)	0.162 (0.142)	0.077 (0.128)	0.082 (0.126)	0.127 (0.131)	0.133 (0.130)
Loans	-0.303***	-0.300***	-0.313***	-0.309***	-0.309***	-0.313***	-0.304***	-0.301***

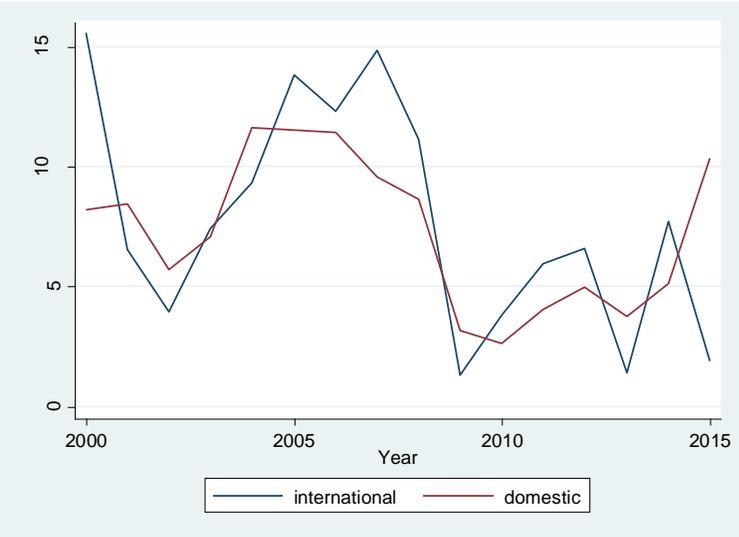
	(0.038)	(0.038)	(0.039)	(0.039)	(0.038)	(0.038)	(0.039)	(0.039)
Inflation	0.000***	0.000***	-0.000***	-0.000***	0.000***	0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	13072	13072	12549	12549	13709	13709	13162	13162
R-sq	0.205	0.207	0.165	0.166	0.205	0.210	0.163	0.166

Table 7. The cyclicity of lending in host countries

The dependent variable is Loan growth, consolidated in columns 1 and 3, and Loan growth, unconsolidated in columns 2 and 4. Loan growth, consolidated is the growth rate of loans from the bank's consolidated balance sheet. Loan growth, unconsolidated is the growth rate of loans from the bank's unconsolidated balance sheet. Home country developing is a dummy variable that is one if the foreign subsidiary's parent bank is located in a low-income or middle-income country according to World Bank classification. GDP growth is the rate of real GDP growth of the subsidiary's country of location. Home country high-income is a dummy variable that is one if the subsidiary's parent bank is located in a low-income or middle-income country according to World Bank classification, and zero otherwise. Assets is the log of total assets in constant 2010 US dollars. Equity is the ratio of equity to total assets. Loans is ratio of loans to total assets. Inflation is the rate of annual change in consumer prices. GDP per capita is GDP per capita in thousands of constant 2000 dollars. Regressions in columns 1 and 2 include subsidiaries located in high-income countries according to World Bank classification. Regressions in columns 3 and 4 include subsidiaries located in low-income and middle-income countries according to World Bank classification. Bank and year fixed effects are included. The sample period is 2000-2015. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

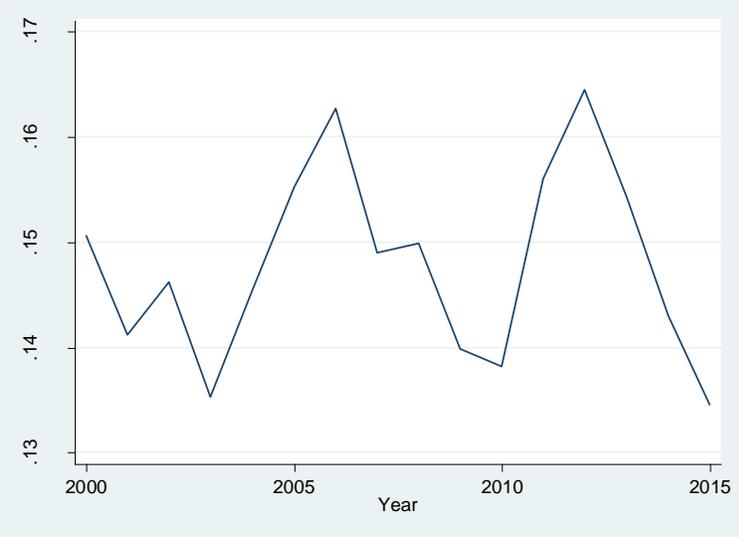
	High-income host		Developing host	
	Loan growth, consolidated (1)	Loan growth, unconsolidated (2)	Loan growth consolidated (3)	Loan growth, unconsolidated (4)
Home country developing	-0.098** (0.042)	-0.111** (0.053)	0.159* (0.086)	0.162* (0.086)
GDP growth * Home country developing	0.002 (0.004)	0.005 (0.004)	0.007 (0.005)	0.006 (0.005)
Home country high-income	-0.011 (0.030)	-0.006 (0.030)	0.093 (0.069)	0.092 (0.067)
GDP growth * Home country high-income	0.004 (0.003)	0.004 (0.003)	0.011*** (0.003)	0.011*** (0.003)
GDP growth	0.017*** (0.003)	0.017*** (0.003)	-0.000 (0.001)	-0.000 (0.002)
Assets	-0.229*** (0.042)	-0.221*** (0.041)	-0.390*** (0.048)	-0.397*** (0.047)
Equity	-0.082 (0.119)	-0.095 (0.119)	-0.242 (0.169)	-0.187 (0.183)
Loans	-0.473*** (0.051)	-0.434*** (0.050)	-0.747*** (0.085)	-0.732*** (0.086)
Inflation	0.002 (0.004)	0.002 (0.004)	0.000 (0.001)	0.000 (0.001)
GDP per capita	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
N	11507	11431	2413	2399
R-sq	0.166	0.157	0.225	0.219

Figure 1. Growth rate of total assets for international and domestic banks



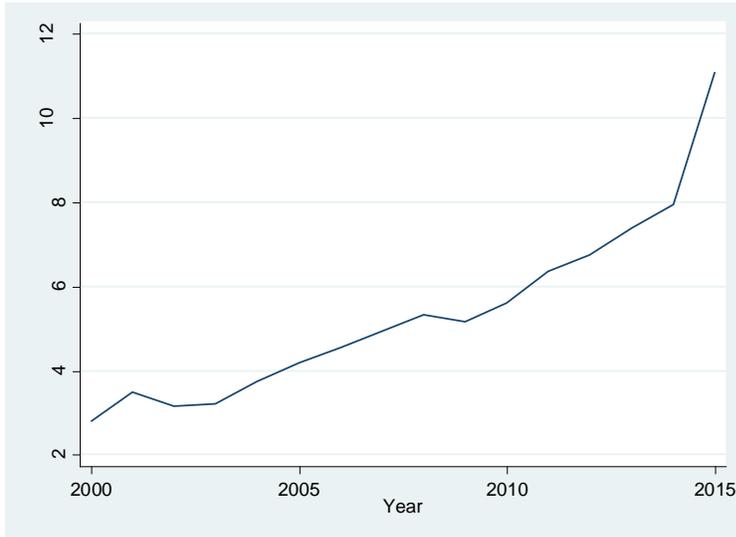
Note: This figure displays yearly means of the growth rate of assets during 2000-2015 for international banks and domestic banks by blue and red lines, respectively.

Figure 2. Foreign liabilities of international banks



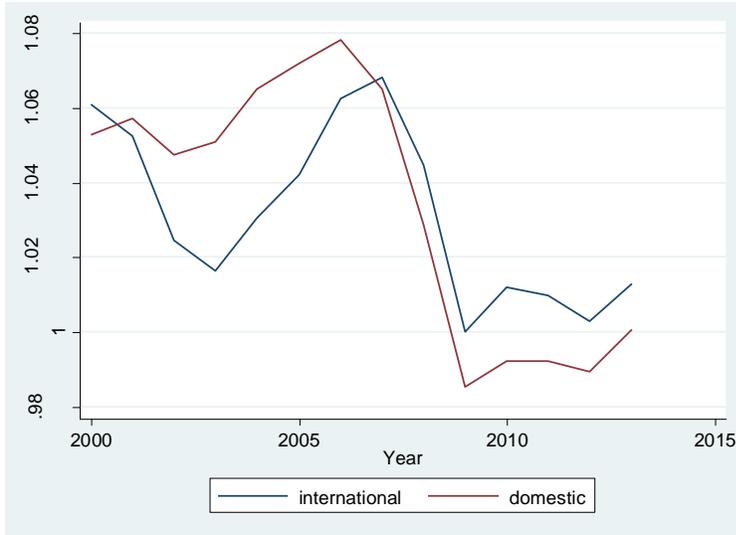
Note: This figure displays yearly means of the foreign liabilities variable during 2000-2015 for international banks. Foreign liabilities is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank’s ownership share divided by the parent bank’s consolidated liabilities.

Figure 3. The number of foreign host countries of international banks



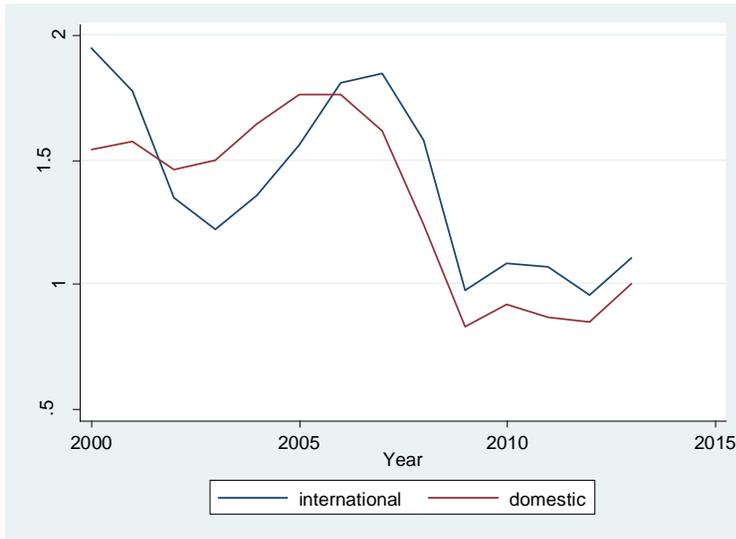
Note: This figure displays yearly means of the number of foreign host countries variable during 2000-2015 for international banks.

Figure 4. Tobin's Q for international and domestic banks



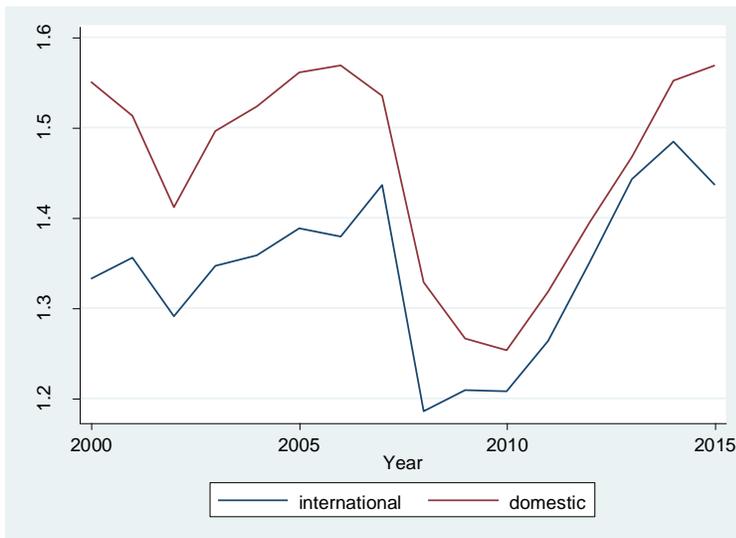
Note: This figure displays yearly means of Tobin's Q during 2000-2013 for international banks and domestic banks by blue and red lines, respectively. Tobin's Q is the sum of market value of common equity, preferred equity, and total liabilities divided by total assets. Market-to-book is ratio of market value of equity to book value of equity.

Figure 5. Market-to-book for international and domestic banks



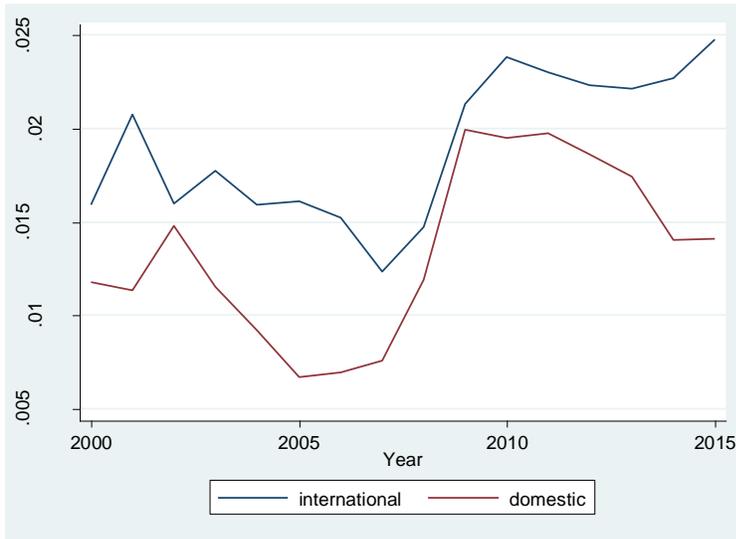
Note: This figure displays yearly means of the market-to-book variable during 2000-2013 for international banks and domestic banks by blue and red lines, respectively. Market-to-book is ratio of market value of equity to book value of equity.

Figure 6. Z-score for international and domestic banks



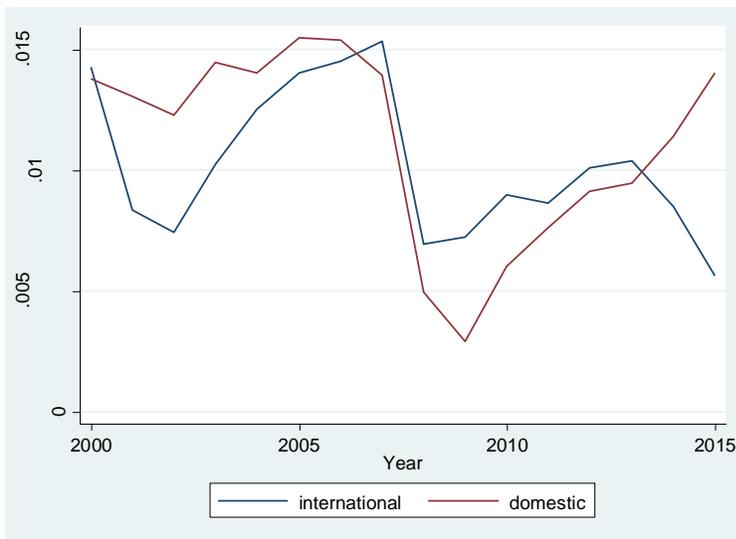
Note: This figure displays yearly means of the Z-score during 2000-2015 for international banks and domestic banks by blue and red lines, respectively. Z-score is $\log \left(\frac{ROA + CAR}{\text{stddev}(ROA)} \right)$, where ROA is return on assets, CAR is the ratio of capital to assets, and $\text{stddev}(ROA)$ is the standard deviation of return on assets. It is calculated for 4-years rolling windows, normalized by total assets, and lagged one period.

Figure 7. NPL ratio for international and domestic banks



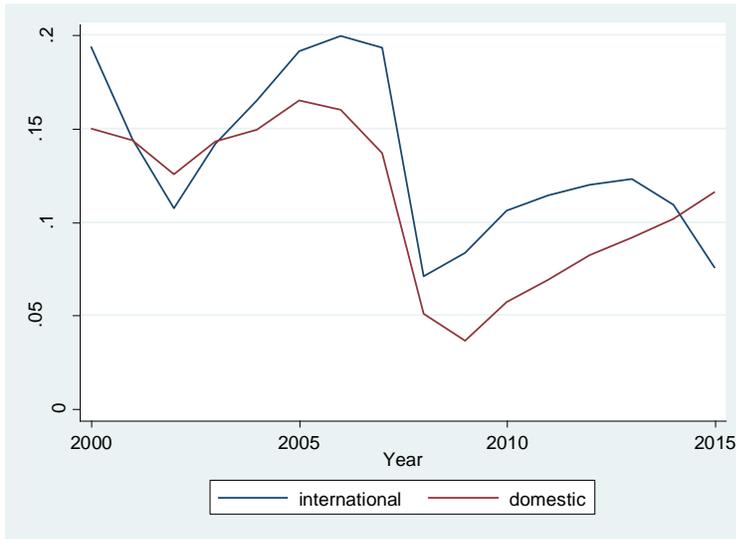
Note: This figure displays yearly means of the NPL ratio during 2000-2015 for international banks and domestic banks by blue and red lines, respectively. NPL ratio is log of ratio of non-performing loans to gross loans + 1

Figure 8. ROA for international and domestic banks



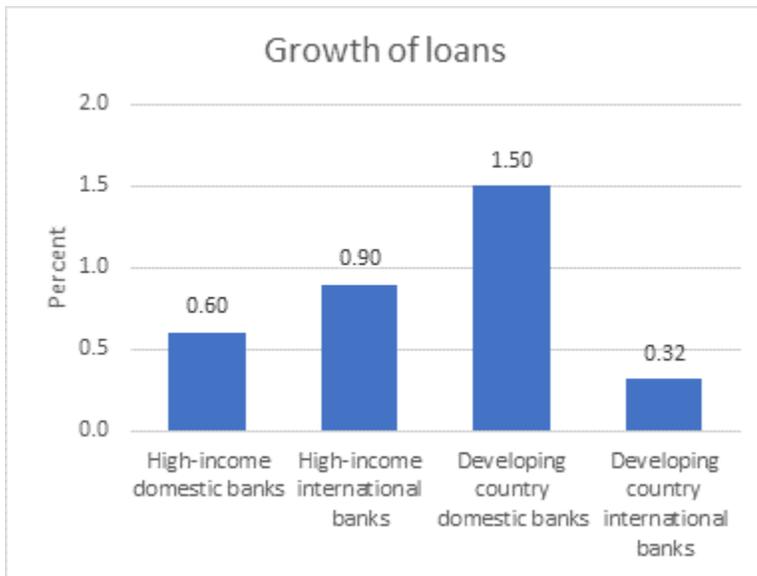
Note: This figure displays yearly means of ROA during 2000-2015 for international banks and domestic banks by blue and red lines, respectively. ROA is the return on average assets.

Figure 9. ROE for international and domestic banks



Note: This figure displays yearly means of ROE for international banks and domestic banks during 2000-2015 by blue and red lines, respectively ROE is ratio of equity to total assets

Figure 10. Change in bank lending associated with a 1% increase in GDP growth



Note: The figure shows marginal effects from regression 6 in Table 7 of bank lending on GDP per capita growth and a number of control variables and bank fixed effects. International bank values are evaluated at the average level of internationalization, here log of the number of countries in which the international bank is active. The coefficients are significant at the 10 percent significance level or better.