

Global Deleveraging and Foreign Banks' Lending to Latin American Countries

Lending by foreign banks to emerging markets is a defining feature of financial globalization. In the years preceding the recent global crisis, foreign bank lending to emerging economies expanded rapidly—whether directly from parent banks' headquarters in advanced economies (cross-border flows) or through their affiliates operating in host countries. In the case of Latin America, lending by foreign banks became a significant source of funding for households and firms over the last decade. Although there is no consensus on the benefits of foreign banks' activity, on balance the presence of foreign-owned banks is generally believed to have enhanced competition and aided overall financial stability.¹

After the onset of the global credit crunch in 2008–09, however, foreign banks became a potential conduit through which financial stress in advanced economies could spread to emerging markets. Funding shortages in interbank markets and the need to deleverage bank balance sheets raised concerns that foreign banks would pull back from international lending activities, potentially disrupting macroeconomic and financial stability in emerging market economies.²

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1. See Claessens, Demirgüç-Kunt, and Huizinga (2001), Galindo, Micco, and Powell (2005), and Moreno and Villar (2005) for a discussion on the costs and benefits of opening the domestic banking sector to foreign competition.

2. The need for parent banks to shore up their balance sheets at a consolidated level raised the possibility that they could drain liquidity and capital from their subsidiaries, thus reducing their affiliates' lending activity in host economies. See Cerutti and others (2010) for a discussion on ring-fencing of local affiliates in host countries, that is, legal and regulatory limits or restrictions on intragroup transfers of profits or capital.

In Latin America, the growth rate of total foreign banks' credit slowed significantly after the collapse of Lehman Brothers in the third quarter of 2008. Yet crucially, the lending behavior of parent banks vis-à-vis their local affiliates in Latin American economies was starkly different. Cross-border lending, which is mostly denominated in foreign currencies, followed a boom-bust pattern, reversing sharply after the fourth quarter of 2008. In contrast, lending by their affiliates operating locally (a large share of which is denominated in host countries' domestic currencies) proved much more resilient and continued to expand, even amid the financial turmoil.

This paper explores how the global financial shocks were transmitted to Latin American countries through the foreign bank lending channel. For this purpose, we undertake an econometric analysis of the determinants of foreign banks' lending to Latin American and Caribbean countries using data from the Bank for International Settlements (BIS). The sample covers twelve Latin American countries and spans 1999 (the first year for which data are available on a quarterly basis) to the first quarter of 2009, at the height of the global credit crunch. We assess the effects of three factors that characterized the recent global financial turmoil: the freezing of international money markets, the deterioration of the financial health of parent banks in advanced economies, and more restrictive lending standards in developed countries' banking systems. The sample period used in the paper thus provides an event study of the transmission of the global crisis to foreign banks' lending, rather than a systematic description of foreign banks' reaction to crises.

To identify the channels of transmission and the possible mitigating factors, we exploit differences in the geographic structure (cross-border versus local affiliates) and currency mix (foreign versus domestic) of foreign banks' lending to Latin American countries at the bilateral level (that is, between each Latin American recipient country and a BIS-reporting creditor country in a given quarter). For this purpose, we rely on publicly available data from the BIS on the currency structure of foreign banks' claims, together with confidential BIS data on the share of foreign banks' total lending extended through local affiliates (in both domestic and foreign currencies).

Our results indicate that international money market conditions had a significant impact on foreign banks' lending to Latin American and Caribbean countries. In particular, an increase in the TED spread caused by liquidity shortages in the global interbank market adversely affects foreign banks' lending growth to Latin American countries. Also, a deterioration of parent banks' own financial soundness in advanced economies is associated with reductions in foreign banks' financing to Latin American countries. Changes

in banks' lending standards in advanced economies also seem to have a statistically significant effect on the growth of foreign banks' credit to Latin American countries.

However, we also find that the propagation of these global financial shocks was significantly more muted for countries where foreign banks conduct a higher share of their lending through their local affiliates in domestic currency than through cross-border transactions in foreign currency. For example, our econometric estimates indicate that a 100 basis point increase in the TED spread (which captures liquidity strains in global interbank markets) is associated with a reduction of 4 percent in foreign banks' lending growth in countries where all foreign banks' credit is extended cross-border. This negative effect disappears in countries where at least 50 percent or more of the lending is disbursed through local affiliates. Likewise, our results suggest that countries in which foreign banks' lending is largely extended in domestic currency would be less vulnerable to a pullback in credit arising from the parent banks' financial problems.

We also explore the role of local affiliates' funding structures in shaping the propagation of international financial shocks. To this end, we use bank-level balance sheet data to construct a measure of local affiliates' reliance on customer deposits to fund credit expansion. We find some evidence that the transmission of financial shocks is more muted in countries where foreign-owned local affiliates relied more heavily on local funding (namely, retail deposits), as opposed to cross-border borrowing (either parent banks' resources or wholesale market funding). This result, however, should be interpreted with caution, given that the evidence is obtained from a sample with a small number of observations. Thus, while we cannot reliably identify this channel separately, some preliminary evidence suggests that subsidiaries' funding models could be relevant for understanding the impact of international liquidity conditions on global banks' lending.

Overall, our results indicate that multinational banks can indeed act as a channel through which financial problems in advanced economies get transmitted to Latin American and Caribbean economies. However, the extent of the transmission and the magnitude of the associated risks depend importantly on the nature of foreign banks' involvement, including the currency of denomination of their claims, the geographic structure of banks' operations, and their local affiliates' funding structure. Thus, when evaluating the desirability and potential risks of allowing (more) foreign bank participation in their economies, policymakers in Latin America and the Caribbean may want to pay attention to multinational banks' varying strategies of cross-border

lending activity vis-à-vis their physical presence in local banking markets, as well as the funding sources and financial autonomy of foreign-owned affiliates operating in the host countries.

The findings presented here are consistent with, and complementary to, previous studies that look at the response of foreign banks' lending to shocks originating in their home countries. Peek and Rosengren show how funding shocks to parent banks in Japan led Japanese bank branches in the United States to reduce credit.³ For Latin American countries, Martínez Pería, Powell, and Vladkova-Hollar analyze annual changes in foreign banks' claims reported by the BIS over the period 1985–2000; they show that negative shocks in the source country can affect foreign banks' behavior in countries where their affiliates are located.⁴ The authors, however, only focus on foreign-currency-denominated lending by foreign banks to the nonfinancial private sector in Latin America. Using bank-level data for seventeen Latin American and Caribbean countries between 1996 and 2007, Galindo, Izquierdo, and Rojas-Suárez find that increased risk aversion in advanced economies results in a decrease in real credit growth for the countries in the region.⁵ McGuire and Tarashev find that a weakening of parent banks' financial health is associated with a slowdown in credit supply to emerging markets more generally.⁶ More recently, Cetorelli and Goldberg document how adverse liquidity shocks in the largest banking systems in 2007–09 affected emerging countries through both cross-border and affiliates' lending.⁷

The remainder of the paper is organized as follows. The next section provides a detailed description of the BIS banking statistics used in the analysis and highlights certain limitations in the data that have a bearing on the interpretation of the main results in the paper. The paper subsequently lays out the empirical strategy and describes the main variables used in the analysis. We then present the baseline results and analyze the importance of the currency and location structure of foreign banks' lending in terms of its resilience to external shocks. A later section looks at the role of subsidiaries' funding sources in explaining the dynamics of foreign banks' lending across countries. The last section concludes.

3. Peek and Rosengren (2000).

4. Martínez Pería, Powell, and Vladkova-Hollar (2005).

5. Galindo, Izquierdo, and Rojas-Suárez (2010).

6. McGuire and Tarashev (2008).

7. Cetorelli and Goldberg (2011, 2012). Using bank-level cross-border syndicated loan data, de Haas and van Horen (2012) show that during the most recent crisis, banks that had to write down subprime assets or experienced sharp declines in their market-to-book ratio transmitted these shocks across borders by curtailing their lending abroad.

Data and Stylized Facts for Latin America

In this paper, we draw extensively on bilateral data from the consolidated international banking statistics reported by the Bank for International Settlements (BIS). We obtain information on gross claims of banks from BIS reporting countries with respect to each Latin American country, with data aggregated across all reporting banks from the source countries.⁸ These claims include loans to the nonfinancial and public sectors, as well as bank-to-bank credit lines and trade-related credit. In addition to loans, these claims cover other forms of financing, such as holding of securities and equity shares; for ease of exposition, we refer to all these forms together as lending. An important feature of the consolidated BIS data on foreign banks' claims is that it nets out intragroup positions between parent banks and their overseas affiliates (such as parent banks' loans to, or equity shares in, subsidiaries or branches operating in host countries).⁹

The BIS uses a particular methodology for reporting the banking statistics data on a bilateral basis, which has a bearing on the type of empirical analysis conducted and the interpretation of the results presented below. In particular, the BIS distinguishes three types of foreign bank lending:

—Cross-border lending extended from parent banks (or other affiliates) located outside the host country (called cross-border claims in the terminology of the BIS). In the terminology of a country's external balance of payments, credit received from a foreign bank through this route represents a capital inflow and the accumulation of a liability to nonresidents. While consolidated banking statistics do not provide a currency breakdown of reporting banks' cross-border claims, for this study we assume that these claims are denominated in foreign currency.¹⁰

8. In practice, there can be important distinctions between "foreign" and "BIS-reporting" banks, especially in Central America, where regionally operating, non-BIS-reporting banks are common. For ease of exposition, however, in this paper we refer to BIS-reporting banks as international, global, or foreign banks.

9. See McGuire and Wooldridge (2005) and Cerutti, Claessens, and McGuire (2011) for a detailed discussion on the structure of the BIS consolidated banking statistics.

10. The BIS locational banking statistics (LBS) database, which employs residence-based criteria, does provide information on the currency composition of banks' balance sheets. When combined with the consolidated banking statistics, the LBS can provide a broad picture of the currency breakdown of banks' consolidated international positions at the aggregate level (see Cerutti, Claessens, and McGuire, 2011). The aggregate data for Latin America suggest that foreign banks' international positions are mostly denominated in dollars and euros.

—Lending extended by foreign banks' affiliates operating in the host country and denominated in foreign currency.

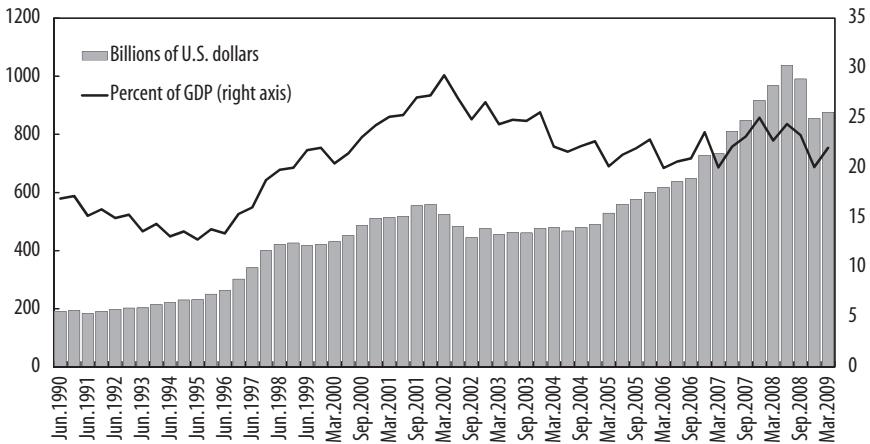
—Lending extended by foreign banks' affiliates operating in the host country but denominated in domestic currency.¹¹

The BIS data on a bilateral basis that are publicly available do not fully distinguish the location mix of foreign banks' lending, that is, between cross-border claims (the first category above) and total claims by foreign-owned affiliates in the host country in all currencies (the sum of the second and third categories). Rather, the BIS breaks down the bilateral data into two categories: (i) international claims, which is the sum of cross-border claims plus the portion of local affiliates' claims that are denominated in foreign currencies; and (ii) local-in-local claims, which correspond to claims by local affiliates denominated in local currency.¹² In what follows, we use the share of local-in-local claims in total claims as a proxy for the share of total foreign banks' lending denominated in domestic currency. Thus, our proxy for the share of domestic-currency lending assumes that all foreign banks' cross-border lending is denominated in foreign currencies.

BIS data on foreign banks' claims are expressed in U.S. dollars at market values. Consequently, changes in the dollar value of outstanding stocks incorporate valuation changes (such as exchange rate changes and the marking to market of securities) and so may differ from net lending flows. Currency valuation effects were potentially significant during the recent global crisis, especially in countries where local-currency-denominated lending represented a high share of the total. In this case, a depreciation of the domestic currency mechanically reduced the value of local-currency loans measured in dollars, understating the growth in foreign banks' claims during the period. Changes in the stock of foreign banks' claims can also reflect capital gains or losses arising from swings in the price of financial assets. In the empirical analysis below, we control for the impact of exchange rate changes on domestic-currency-denominated claims. However, lack of data on the composition of foreign banks' claims by type of financial asset (and their currency

11. Local affiliates include foreign-owned banks established in the host country (subsidiaries) and the agencies of the home country operating abroad (branches). Since the affiliates are residents of their host countries, the credit they extend locally does not, in itself, represent a balance of payments inflow or an external debt of the host country.

12. For example, the publicly available BIS data do not distinguish between the total amount of claims of Spanish banks on Brazil that have been booked from headquarters abroad and total claims that have been extended by Spanish affiliates located in Brazil in both domestic and foreign currency.

FIGURE 1. Foreign Banks' Lending in Latin America and the Caribbean^a

Source: Authors' calculations, based on data from the Bank for International Settlements (BIS) and the International Monetary Fund's International Financial Statistics (IFS).

a. Data exclude offshore centers.

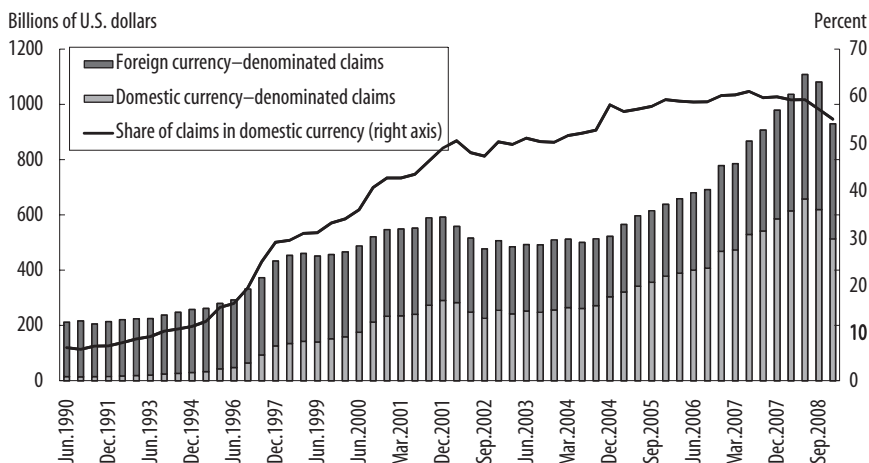
of denomination) precludes directly controlling for valuation effects arising from changes in equity and bond values.¹³

Finally, BIS data do not directly measure the source of funding of foreign banks' lending. Claims booked outside the recipient economy (that is, cross-border claims) are typically funded in international wholesale markets.¹⁴ However, lending by local affiliates could be funded by local deposits (in either domestic or foreign currency), transfers from parent banks, or wholesale funds. In the empirical analysis below, we use bank-level balance sheet data from Bankscope to construct a measure of foreign affiliates' reliance on customer deposits as a source of funding.

Over the last ten years, foreign banks' lending to Latin America and the Caribbean expanded rapidly, becoming a significant source of funding for the private sector (figure 1). As a share of GDP, foreign banks' total claims

13. Cerutti (2011) discusses the importance of correcting the BIS consolidated banking data for breaks in the series associated with the expansion in the coverage of reporting banks—in particular, the inclusion starting in March 2009 of the former U.S. investment banks' positions in the consolidated banking statistics of the United States. Lack of bilateral data, however, precluded us from making the adjustment for changes in the reporting population of banks to the BIS data used in the empirical analysis.

14. Fender and McGuire (2010).

FIGURE 2. Currency Structure of Foreign Banks' Claims in Latin America and the Caribbean

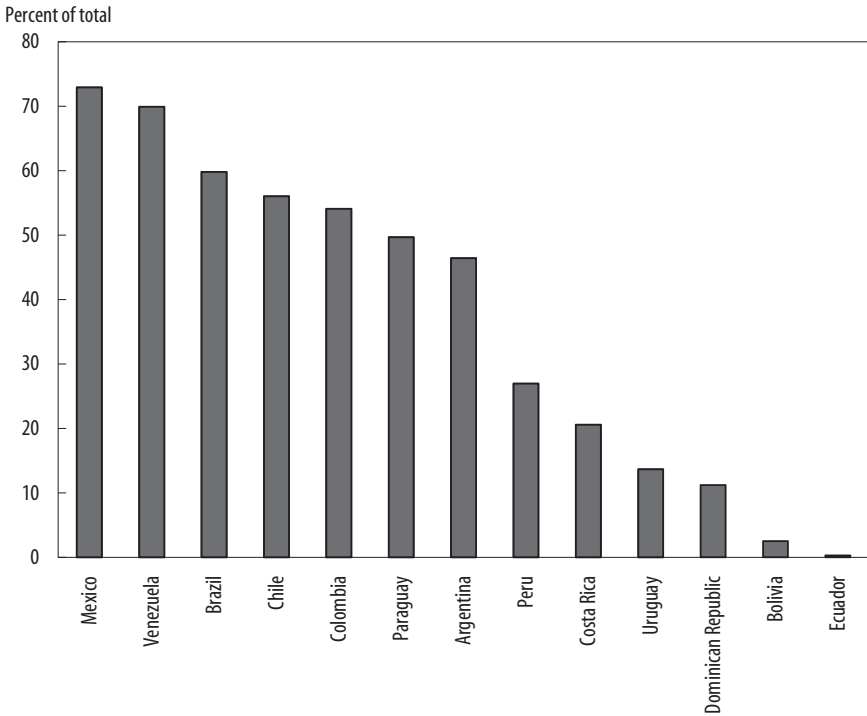
Source: Authors' calculations, based on BIS and IFS data.

are most important in Chile (where they represent almost 50 percent of GDP), followed by Costa Rica and Mexico. In absolute size, Brazil, Mexico, and Chile accounted for almost 80 percent of all outstanding claims by foreign banks to the region by year-end 2008.¹⁵

During this period, the expansion of global banks' activities in Latin America and the Caribbean has largely taken the form of increased domestic-currency lending by their local affiliates, rather than direct cross-border lending from headquarters (figure 2).¹⁶ As of year-end 2008, 60 percent of total foreign bank lending to the region was denominated in domestic currency,

15. Banks from Spain and the United States are the dominant players, jointly accounting for approximately 50 percent of all outstanding financing by foreign banks to Latin American and Caribbean countries. Canadian banks account for the largest share of foreign bank assets in the Caribbean. Foreign bank claims on Central America, on the other hand, are relatively diversified among the United States, the United Kingdom, and other western European countries. See Powell (2012) for a more recent account of the structure of foreign banks' lending in Latin American countries.

16. The shift in foreign banks' lending strategy from cross-border lending by bank headquarters to lending through local affiliates was based, in part, on the acquisition by foreign-owned local affiliates of large local banks with an already-significant local deposit base. For a detailed account of foreign banks' mergers and acquisitions in the region, see Pozzolo (2008).

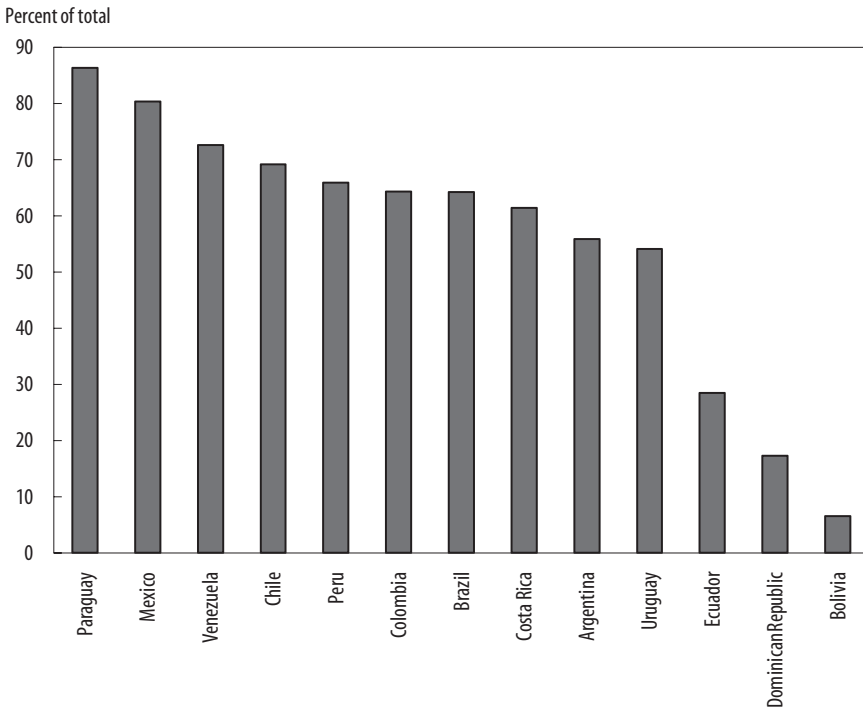
FIGURE 3 . Share of Foreign Banks' Lending Denominated in Local Currency, 2008

Source: Authors' calculations, based on BIS data.

while 70 percent of the total was disbursed through local affiliates (in all currencies). There is, however, significant heterogeneity across countries. For most of the region's larger economies (namely, Brazil, Mexico, and Venezuela), half or more of all foreign bank credit is denominated in local currency, while this share is less than 20 percent in the highly dollarized economies of Uruguay, the Dominican Republic, and Bolivia (figure 3).¹⁷ The share of foreign banks' claims booked by their local affiliates ranges from close to 80 percent in Paraguay and Mexico to less than 20 percent in the Dominican Republic and Bolivia (figure 4).

17. See also Jara and Tovar (2008) for an analysis of the currency structure of foreign banks' lending to Latin America and the Caribbean.

FIGURE 4. Share of Foreign Banks' Lending Extended through Local Affiliates, 2008



Source: Authors' calculations, based on BIS data.

Empirical Strategy

To shed light on how the credit crunch cascaded into Latin America, this section looks at the determinants of international bank lending to the region from 1999:4 to 2009:1, using a multivariate panel regression framework. The empirical model is focused on analyzing the impact of the following three factors on foreign banks' lending activity to Latin American and Caribbean countries: global liquidity conditions; the financial soundness of major international financial institutions; and lending cycles in advanced economies.

The baseline empirical analysis is based on a reduced-form model specification given by

$$\begin{aligned}
 (1) \quad FBL_{ijt} = & \beta_0 + \beta_1 TED_t + \beta_2 EDF_{jt-1} + \beta_3 LENDS_{jt-1} + \beta_4 GDP_B_{it} \\
 & + \beta_5 GDP_L_{it} + \beta_6 CRATING_{it} + \beta_7 DEPREC_{it} \\
 & + \sum_{s=1}^3 \alpha Q_s + \gamma_{ij} + \varepsilon_{it},
 \end{aligned}$$

where the dependent variable, *FBL*, is the quarterly growth rate in the stock of outstanding gross claims of foreign banking system *j* on Latin American country *i* in quarter *t*.¹⁸ The sample combines twelve Latin American and Caribbean borrower countries and 14 non-regional lender countries that report to the BIS.¹⁹

The dependent variable is the sum of direct cross-border lending by parent banks and lending by foreign affiliates in each country, in domestic and foreign currency. It includes international banks' lending to banks in the host country that are not their subsidiaries or branches (such as loans, bank-to-bank credit lines, and trade-related credit) and credit to the nonfinancial sector. It also covers portfolio flows (such as holdings of securities) and equity shares in unrelated institutions (in particular, mergers and acquisitions, which are especially important for the region during the sample period).

Many growth rate observations of the dependent variable are extremely large, primarily as a result of countries entering or exiting the population of reporting banks, which can lead to sudden jumps in the outstanding stock of lending vis-à-vis particular countries.²⁰ To take account of outliers, we

18. The dependent variable is gross only in the sense that we do not consider changes in the liabilities of foreign banks vis-à-vis Latin American countries. It is net in the sense that it includes repayments of loans made by country *i* to country *j*.

19. The twelve Latin American and Caribbean borrower countries included in the sample are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Mexico, Peru, Paraguay, Uruguay, and Venezuela. They accounted for more than 95 percent of the outstanding foreign banks' lending in the region at the end of 2008. We excluded Ecuador, which is an officially dollarized country, and Panama, which is a regional banking center and is classified as an offshore center by the BIS. The rest of the countries in the region were not included in the sample because data were not available for at least one of the explanatory variables. We excluded from the estimation those bilateral observations where the BIS-reporting lender country is from Latin America (namely, Brazil, Chile, and Mexico).

20. In addition, foreign banks' credit to smaller countries constitutes a very small share of total foreign credit, so it tends to exhibit large variations over a small base.

exclude those observations where the dependent variable fell in the lower or upper 2.5 percent of its distribution in the sample.²¹

The explanatory variables are all observed at a quarterly frequency, except where noted. They are as follows:²²

—*TED* is the spread between the three-month U.S. dollar LIBOR and the three-month U.S. treasury bill rate (called the *TED* spread), which captures liquidity strains in global interbank markets;

—*EDF* (or expected default frequency) is the median value of the one-year-ahead expected probability of default among all internationally active banks within each BIS-reporting country, which captures the financial soundness of parent banks headquartered in advanced economies;²³ most countries recorded a marked deterioration in *EDFs* after September 2008, reflecting declining capitalization and earnings and rising stock price volatilities of publicly listed banks, as shown in figure 5;

—*LENDS*, which captures changes in the lending cycle for the different advanced economies, is defined as the percentage of senior loan officers who reported credit tightening in a given quarter, minus the percentage of officers who reported an easing of credit standards to large and medium-sized firms in each lender country;

—*GDP_B* measures the percentage change in quarterly GDP in the Latin American borrower country, which captures the buoyancy of economic activity in the borrowing country;

—*GDP_L* measures the percentage change in quarterly GDP in the BIS-reporting lender country;

—*CRATING* is a composite indicator of the economic, political, and financial robustness of each borrower country, to account for the fact that lower

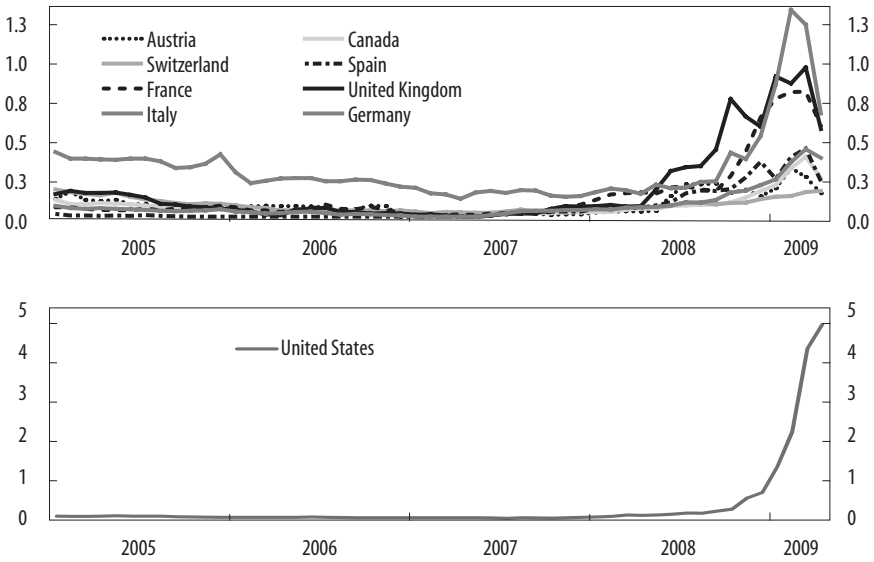
21. Excluding these observations, however, significantly reduces the regression fit of our model, since much of the overall variance in the dependent variable is contained in these observations. McGuire and Tarashev (2008) report similar findings.

22. The appendix provides more details on the definition and sources of the variables used.

23. The expected default probability is an equity-market-implied measure of default risk calculated by Moody's KMV Credit Edge for a large set of individual publicly listed banks around the world. It is based on a contingent-claims approach, which takes into account each bank's market value of assets, its volatility, and its capital structure (see KMV, 2001; Gray and Malone, 2008). To construct a representative measure for each creditor country at a quarterly frequency, we followed several steps. First, we identified all publicly listed banks with international operations within each BIS-reporting country (nearly 100 in total), based on a comprehensive cross-country list of multinational banks kindly provided by Patrick McGuire. Second, for each globally active bank, we averaged the daily *EDF* estimated by Moody's over a given quarter. Finally, we took the median value over all these banks in each BIS-reporting country and quarter.

FIGURE 5. Financial Stress of Global Banks in Advanced Countries

Market indicator of banks' expected default frequency; median within countries



Source: Authors' calculations, based on data from Moody's KMV.

perceived economic and institutional risks tend to attract foreign bank investment; we use the International Country Risk Rating, published by the PRS Group, where a higher value indicates better macroeconomic frameworks and institutions; and

—*DEPREC* is the percentage change in the borrower country's nominal exchange rate against the U.S. dollar, which captures mechanical valuation effects (and possibly also portfolio reallocations that could occur in response to exchange rate movements).

In addition, the panel data estimation controls for fixed effects specific to each lender-borrower pair (γ_{ij}), to account for time-invariant and unobserved factors driving cross-country differences in foreign bank lending.²⁴ We also include quarter dummies *Q1*, *Q2* and *Q3* for the first, second, and third quarters

24. Foreign bank presence tends to be higher in countries with a common language, similar legal systems and banking regulations, and geographical proximity (Claessens and van Horen, 2008). For example, in Latin America and the Caribbean, 60 percent of foreign banks are headquartered in Spain and the United States, whereas in Europe and Central Asia more than 90 percent of foreign banks are headquartered in the European Union.

of every year, respectively. Given that the variable *TED* varies purely along the time-series dimension, the specification does not include time dummies.

Baseline Results

Our main findings are presented in the first column of table 1. The estimated model provides a plausible explanation of the factors that affect lending by foreign banks to countries in Latin America and the Caribbean. We find a

TABLE 1. Determinants of Foreign Banks' Lending to Latin America^a

	<i>Baseline</i>	<i>Additional controls</i>
<i>Explanatory variable</i>	(1)	(2)
<i>TED</i> spread	-0.02* (0.01)	-0.02* (0.01)
Parent bank's financial stress	-9.81*** (1.18)	-9.77*** (1.17)
Tighter lending standards	-0.05*** (0.01)	-0.05*** (0.01)
GDP growth of borrower	0.12** (0.06)	0.12** (0.06)
GDP growth of lender	0.07 (0.07)	0.07 (0.07)
Composite credit rating indicator	0.48** (0.17)	0.43** (0.21)
Nominal exchange rate depreciation	-0.11*** (0.03)	-0.11*** (0.03)
Capital controls		-1.63 (2.36)
Banking crisis		-1.41 (2.04)
Quarter dummy variables	Yes	Yes
Borrower/lender fixed effects	Yes	Yes
<i>Summary statistic</i>		
No. observations	4,695	4,695
<i>R</i> ²	0.03	0.05

Source: Authors' calculations.

*Statistically significant at the 10 percent level.

**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

a. This table reports the panel fixed-effects regression described in equation 1 in the text. The dependent variable is the quarterly percent change in total foreign banks' lending. The estimation method is panel ordinary least squares (OLS) with fixed effects, and the sample period is from the fourth quarter of 1999 to the first quarter of 2009. The variables Parent bank's financial stress and Tighter lending standards are entered with one lag. The sample used excludes extreme observations, defined to be those below the 2.5th percentile and above the 97.5th percentile of the distribution of percent changes in foreign banks' lending for the whole sample. Robust standard errors are clustered at the borrower-country level and are shown in parentheses.

significant link between global money market conditions and changes in international banks' lending to the region. Consistent with findings by the World Bank and McGuire and Tarashev, deterioration in interbank liquidity adversely affects foreign banks' lending growth to the region.²⁵ The coefficient estimates suggest that a 100-basis-point increase in the *TED* spread is associated, on average, with about a two percentage point reduction in the quarterly growth rate of total lending by global banks.

A weakening of parent banks' financial health has consistently led to slower growth in global banks' lending to the region. A rise of one standard deviation (20 basis points) in banks' *EDF* is associated with a 1.9 percentage point average decrease in the growth rate of foreign banks' lending in the subsequent quarter. This result is consistent with recent work by Čihák and Koeva Brooks, which shows that bank loan supply in the euro area moves in line with banks' financial soundness.²⁶ Changes in banks' lending standards in advanced economies also seem to have a statistically significant effect on the growth of foreign banks' credit to Latin America, once we control for other factors.²⁷

Exchange rate depreciations are associated with a significant slowdown in the dollar value of foreign banks' lending during the same quarter. These estimates could be capturing mechanical valuation effects, as well as the impact of currency crises that occurred during the sample period.²⁸ The effects of other explanatory variables have the expected sign and are consistent with theory. Home country conditions drive changes in foreign bank lending.²⁹ Higher economic growth in the Latin American host country is associated with an increase in foreign banks' lending growth during the same quarter.³⁰ Institutional improvements (as proxied by a more favorable economic and

25. World Bank (2008); McGuire and Tarashev (2008). As discussed by McGuire and von Peter (2009), such dollar shortages became particularly severe after the Lehman Brothers bankruptcy, which prompted the U.S. Federal Reserve to establish swap lines with other central banks, in particular in European countries.

26. Čihák and Koeva Brooks (2009).

27. Herrmann and Mihaljek (2009) study the nature of spillover effects in cross-border bank lending flows from advanced to emerging markets using confidential BIS bilateral data on locational banking statistics. They find that higher global risk aversion and higher expected market volatility seem to have been the most important channels through which spillover effects occurred during the crisis of 2007–08.

28. The literature suggests that borrowing conditions are likely to tighten for a country that experiences a currency collapse, given the balance sheet effects due to currency mismatches.

29. This is consistent with Goldberg (2002) and Martínez Pería, Powell, and Vladkova-Hollar (2005).

30. Changes in economic activity in the lender country do not seem to have a significant independent effect over the sample period.

political risk rating) lead to stronger investor confidence and thus attract more foreign bank lending, a result also found by Papaioannou.³¹ Column 2 in table 1 shows that the results are robust to the inclusion of controls for the host country on the intensity of capital controls and the health of the financial sector (proxied by a dummy for the yearly occurrence of banking crisis).³²

Local-Currency Lending as a Firewall for Global Financial Shocks

In this section, we estimate a variant of equation (1) in which we allow shocks to global liquidity conditions, parent banks' financial health, and lending cycles in advanced economies to have differential effects across Latin American and Caribbean countries, according to the share of foreign banks' claims on that country that are extended in domestic currency. We estimate the following specification:

$$(2) \quad FBL_{ijt} = \beta_0 + \beta_1 TED_t + \beta_2 EDF_{t-1} + \beta_3 GDP_{it} + \beta_5 CRATING_{it} \\ + \beta_5 DEPREC_{it} + \beta_6 SHLC_{ijt} + \beta_7 (TED_t \times SHLC_{ijt}) \\ + \beta_8 (EDF_{t-1} \times SHLC_{ijt}) + \beta_9 (LENDSt_{t-1} \times SHLC_{ijt}) \\ + \beta_{10} (DEPREC_{ijt} \times SHLC_{ijt}) + \lambda_t + \gamma_{ij} + \varepsilon_{it},$$

where $SHLC_{ijt}$ is our proxy for the fraction of domestic-currency-denominated claims in total claims of foreign banks from lender country j on recipient country i in quarter t .³³ We also included the interaction term $(DEPREC_{ijt} \times SHLC_{ijt})$, to control for the fact that exchange rate valuation effects from fluc-

31. Papaioannou (2009). One concern with the baseline specification is that the estimated parameters could be driven by a time-varying common factor (the TED spread) if most of the variation in the dependent variable comes from the time series dimension. We indeed find that for the dependent variable (the quarterly growth rate of foreign banks' outstanding claims) the variation is larger within lender-borrower pairs than between lender-borrower pairs. However, the between variation still represents approximately 20 percent of the overall variance, providing meaningful cross-sectional variation to identify the effects.

32. The intensity of capital controls is proxied by an annual index of international financial restrictiveness constructed by Baba and Kokenyne (2011) for the period 1999–2009 using IMF data on capital account restrictions. The banking crisis dummy is constructed using the banking crisis database from Laeven and Valencia (2010).

33. As explained earlier, the variable $SHLC$ is constructed as the share of domestic-currency lending by local affiliates over total foreign banks' lending, which assumes that cross-border claims are not denominated in domestic currency. Thus, $SHLC$ combines both a currency composition and a location (cross-border versus local affiliate) dimension.

tuations in the exchange rate may be bigger in countries with a larger share of foreign banks' claims denominated in domestic currency.³⁴

The results, reported in the first column of table 2, indicate that the transmission of global financial shocks through the foreign bank lending channel was significantly more muted in countries where foreign banks conducted a higher share of their lending in the host countries' domestic currency.³⁵ For example, a 1 percent increase in the *TED* spread is associated with a 4 percent reduction in foreign banks' lending in countries where all foreign banks' credit is denominated in foreign currency. However, this effect is not significantly different from zero in countries where more than 60 percent (approximately) of the lending is denominated in domestic currency. The positive and statistically significant estimated effect on the interaction with parent banks' financial stress (*EDF*) provides corroborating evidence on the buffering role of local-currency lending when the parent banks' funding problems forced them to reduce their global exposures.³⁶ In addition, the significant negative effect estimated on the interaction of the domestic-currency share with the depreciation rate highlights the importance of controlling for mechanical valuation effects that can significantly understate the growth in foreign banks' claims (measured in dollars) during crisis periods.

One concern with the previous result is that the fraction of business conducted by foreign banks in domestic currency can itself endogenously change. For example, during a crisis, the share of lending in foreign currency may increase due to heightened uncertainty and the mechanical valuation effects of a depreciation of the domestic currency. To allay concerns about endogeneity, we calculate the average share of local-currency lending for each bilateral pair over the sample period and use this value (a constant) in the interaction terms.³⁷ As shown in the second column of table 2, using a constant share in the interaction terms has a negligible impact on the basic result.

34. We thank Eduardo Lora for making this point.

35. For the variable representing the share of domestic-currency claims, the between variation is four times as large as the within variation, explaining roughly 66 percent of the total variation. We thus think it provides meaningful variation to identify the effects of key explanatory variables.

36. Acharya and Schnabl (2010) show that the parent banks' pre-crisis exposure to asset-backed commercial paper (as a percentage of equity capital) was a very good ex ante indicator of the subsequent funding difficulties in the aftermath of the global crisis.

37. As a result, the main effect on the share of domestic-currency lending is not independently estimated, as it is subsumed in the fixed effects specific to each lender-borrower pair. In unreported estimations, we controlled for the potential endogeneity of the fraction of business conducted in local currency by using predetermined values instead of averages. The main results were unaffected.

TABLE 2. Determinants of Foreign Banks' Lending to Latin America: The Buffer Role of Local Currency Lending^a

<i>Explanatory variable</i>	<i>Baseline</i>	<i>Predetermined domestic-currency share</i>
	(1)	(2)
<i>TED spread</i>	-0.03** (0.01)	-0.03* (0.01)
<i>TED spread × Domestic-currency share</i>	0.05** (0.02)	0.05* (0.02)
<i>Parent bank's financial stress</i>	-12.94*** (1.50)	-12.87*** (1.55)
<i>Parent bank's financial stress × Domestic-currency share</i>	18.64*** (5.79)	17.91*** (5.76)
<i>Tighter lending standards</i>	-0.06*** (0.02)	-0.06*** (0.02)
<i>Tighter lending standards × Domestic-currency share</i>	0.06 (0.05)	0.04 (0.05)
<i>GDP growth of borrower</i>	0.12 (0.07)	0.12 (0.07)
<i>GDP growth of lender</i>	0.05 (0.07)	0.05 (0.07)
<i>Composite credit rating indicator</i>	0.47** (0.17)	0.46** (0.16)
<i>Domestic-currency share</i>	16.56 (3.37)	—
<i>Nominal exchange rate depreciation</i>	-0.02 (0.03)	-0.02 (0.03)
<i>Depreciation × Domestic-currency share</i>	-0.56*** (0.14)	-0.56*** (0.15)
<i>Quarter dummy variables</i>	Yes	Yes
<i>Borrower/lender fixed effects</i>	Yes	Yes
<i>Summary statistic</i>		
<i>No. observations</i>	4,326	4,326
<i>R²</i>	0.04	0.03

Source: Authors' calculations.

*Statistically significant at the 10 percent level.

**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

—Not applicable.

a. This table reports the panel fixed-effects regression described in equation 2 in the text. The dependent variable is the quarterly percent change in total foreign banks' lending. The estimation method is panel OLS with fixed effects, and the sample period is from the fourth quarter of 1999 to the first quarter of 2009. The variables Expected default probability and Lending standards are entered with one lag. The sample used excludes extreme observations, defined to be those below the 2.5th percentile and above the 97.5th percentile of the distribution of percent changes in foreign banks' lending for the whole sample. Robust standard errors are clustered at the borrower-country level and are shown in parentheses.

Disentangling the Role of Currency and Location Structure of Foreign Banks' Lending

The main result reported in the previous section is that the sensitivity of foreign banks' lending to global financial shocks is significantly more muted in countries where foreign banks conduct a higher share of their lending in domestic currency. In principle, this could be capturing at least two different channels (or a combination of them). First, a higher fraction of local-currency lending could be capturing the resilience of foreign banks' lending to balance sheet effects after large depreciations. In a highly dollarized financial system, for example, a domestic-currency depreciation could push up the cost of borrowing or increase expected defaults when borrowers have currency mismatches—leading to a stronger retrenchment in credit during uncertain times.

Second, a higher share of foreign banks' lending denominated in domestic currency could also be reflecting a location mix, that is, a larger proportion of foreign banks' claims extended through local affiliates rather than directly from parent banks. Given that cross-border lending is rarely extended in local currency, the domestic-currency share and local affiliates' share of total foreign banks' lending should, in principle, be highly correlated in countries with low financial dollarization. As García-Herrero and Martínez Pería discuss, a more substantial “brick and mortar” presence in host countries requires paying higher fixed and irreversible costs (like local networks and real assets), making local affiliates' lending in any currency more stable and less responsive to negative shocks than cross-border lending.³⁸

To disentangle these two drivers, we obtained access to confidential BIS data on total affiliates' claims (in both domestic and foreign currencies) on a *bilateral basis* since 2005. Using these data, we calculated the share of total foreign banks' claims booked by local affiliates for each lender-borrower pair on a quarterly basis. We then estimated this share for the period 1999–2004 using the following procedure and assumptions. First, we backed out the amount of local affiliates' lending in foreign currency by subtracting local-in-local claims (which are publicly available) from total affiliates' claims. We then calculated, for 2005, the share of local affiliates' foreign-currency claims in total foreign-currency claims (that is, international claims in the BIS terminology). Assuming that this same ratio prevailed over the period 1999–2004,

38. García-Herrero and Martínez Pería (2007). Furthermore, local affiliates could have a better understanding of the domestic conditions and projects, making them less susceptible to engage in the type of generalized withdrawal that characterizes herding behavior when conditions deteriorate.

we then obtained the (unobserved) amount of dollar-currency lending by local affiliates. Lastly, we calculated the total amount of lending by affiliates by adding the publicly available BIS data on local-currency claims.³⁹

The first column of table 3 shows the estimation results for an augmented specification of equation 2, which includes a second set of interaction terms between the share of lending extended through foreign banks' affiliates and the global financial variables. The evidence suggests that both the currency mix (foreign versus domestic) and location mix (cross-border versus local) of foreign banks' lending are important for understanding the extent of the transmission of shocks. In particular, a higher proportion of foreign banks' lending in domestic currency seems to buffer the propagation of parent banks' financial problems, while a higher share of lending extended through local affiliates seems to attenuate the negative impact of global liquidity shortages. The latter result is consistent with that reported by García-Herrero and Martínez Pería, who show that countries in which a larger share of foreign bank lending is extended through local affiliates experience lower volatility in total foreign banks' lending.⁴⁰ The econometric evidence is also consistent with the aggregate behavior of cross-border lending vis-à-vis local affiliates' lending around the Lehman Brothers crisis. Growth in cross-border lending, which is mostly denominated in foreign currencies, reversed sharply after the fourth quarter of 2008. In contrast, lending by their affiliates operating locally (a large share of which is denominated in host countries' domestic currencies) continued to expand, even amid the financial turmoil (see figure 6).

The Role of Local Affiliates' Funding Structure: Some Preliminary Evidence

In this section we explore the role of local affiliates' funding structure in shaping the propagation of international financial shocks. In theory, in countries where local affiliates fund themselves mostly with local deposits (in

39. We verified our estimates in two ways. First, we made sure that our implied estimates of the dollarization of credit of local affiliates for the period 1999–2004 were not significantly different from the average dollarization of the domestic banking system in each country. Second, for the case of Italy, Spain, and the United States, we cross-checked our estimates of the share of total lending by local affiliates in these Latin American countries with actual data reported by García-Herrero and Martínez Pería (2005) for the overlapping period 1999–2002. Reassuringly, we got very close values in the majority of cases.

40. García-Herrero and Martínez Pería (2007).

TABLE 3. Determinants of Foreign Banks' Lending to Latin America: Disentangling the Effects^a

<i>Explanatory variable</i>	<i>Baseline</i>	<i>Predetermined shares</i>
	(1)	(2)
<i>TED spread</i>	-0.04** (0.02)	-0.04* (0.02)
<i>TED spread × Domestic-currency share</i>	-0.05 (0.05)	-0.05 (0.05)
<i>TED spread × Local affiliates' share</i>	0.11** (0.05)	0.09** (0.04)
<i>Parent bank's financial stress</i>	-13.08*** (1.45)	-13.03*** (1.50)
<i>Parent bank's financial stress × Domestic-currency share</i>	33.28** (14.52)	31.59* (15.84)
<i>Parent bank's financial stress × Local affiliates' share</i>	-13.58 (13.78)	-12.82 (15.82)
<i>Tighter lending standards</i>	-0.06** (0.03)	-0.06* (0.03)
<i>Tighter lending standards × Domestic-currency share</i>	-0.09 (0.09)	-0.02 (0.11)
<i>Tighter lending standards × Local affiliates' share</i>	0.10 (0.08)	0.04 (0.10)
<i>GDP growth of borrower</i>	0.11 (0.09)	0.11 (0.08)
<i>GDP growth of lender</i>	0.04 (0.07)	0.04 (0.07)
<i>Composite credit rating indicator</i>	0.42** (0.17)	0.42** (0.17)
<i>Domestic-currency share</i>	3.09 (4.65)	—
<i>Local affiliates' share</i>	-5.17 (4.21)	—
<i>Nominal exchange rate depreciation</i>	-0.01 (0.03)	0.00 (0.03)
<i>Depreciation × Domestic-currency share</i>	-0.38* (0.21)	-0.34** (0.15)
<i>Depreciation × Local affiliates' share</i>	-0.14 (0.17)	-0.18** (0.07)
<i>Quarter dummy variables</i>	Yes	Yes
<i>Borrower/lender fixed effects</i>	Yes	Yes
<i>Summary statistic</i>		
<i>No. observations</i>	4,027	4,027
<i>R²</i>	0.04	0.04

Source: Authors' calculations.

*Statistically significant at the 10 percent level.

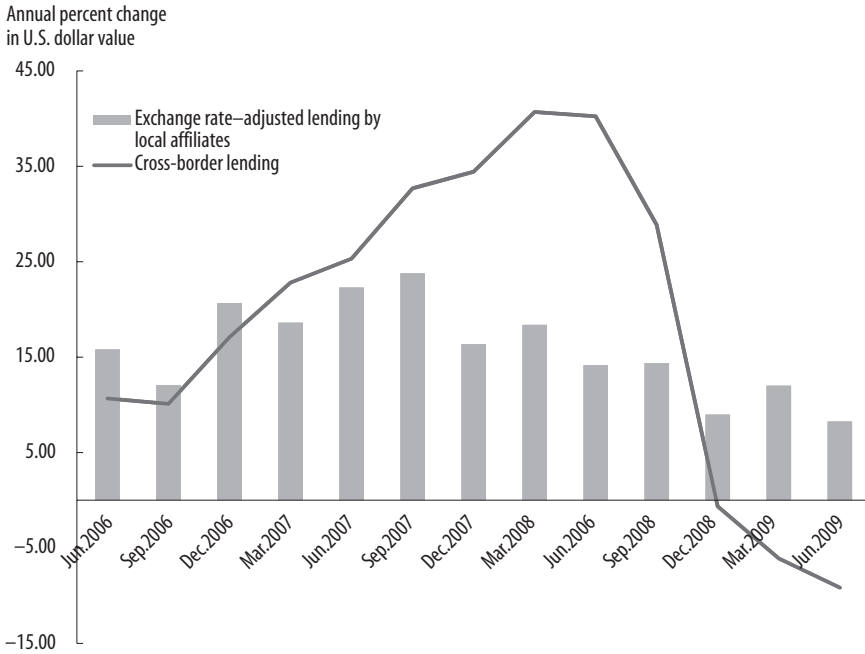
**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

—Not applicable.

a. This table reports the panel fixed-effects regression of an augmented version of equation 2 described in the text. The dependent variable is the quarterly percent change in total foreign banks' lending. The estimation method is panel OLS with fixed effects, and the sample period is from the fourth quarter of 1999 to the first quarter of 2009. The variables Expected default probability and Lending standards are entered with one lag. The sample used excludes extreme observations, defined to be those below the 2.5th percentile and above the 97.5th percentile of the distribution of percent changes in foreign banks' lending for the whole sample. Robust standard errors are clustered at the borrower-country level and are shown in parentheses.

FIGURE 6. Channels of Foreign Banks' Lending to Latin America and the Caribbean: Differences in Behavior



Source: Authors' calculations, based on BIS data.

domestic or foreign currency), foreign banks' credit could be less exposed to a sudden withdrawal of short-term external funding or solvency problems from their parent banks.⁴¹

Teasing out the independent effect of subsidiaries' funding models is challenging for two reasons. First, as noted earlier, BIS data do not directly measure the source of funding of foreign banks' lending. Second, a high share of foreign banks' lending conducted in domestic currency could be reflecting prudential regulations that require local affiliates to fund themselves in

41. Claessens and others (2010) provide systematic evidence of the role of banks' reliance on wholesale funding in the international transmission of the liquidity crunch in September 2008.

domestic markets (that is, through their local deposit base) as opposed to relying on parent bank resources or wholesale financing.⁴²

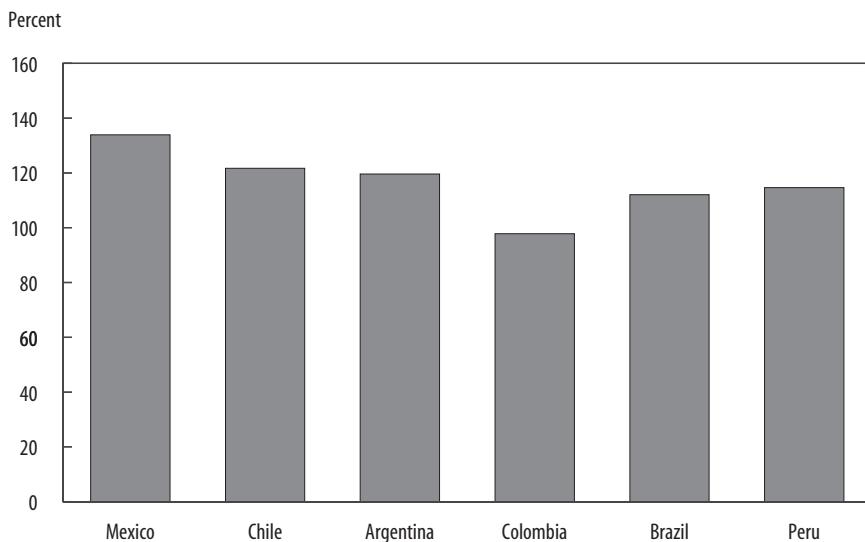
With these caveats in mind, we use bank-level balance sheet data from Bankscope to construct a measure of foreign affiliates' reliance on customer deposits as a source of funding. For each of the twelve countries in our sample, we first identified the presence of foreign-owned affiliates in the domestic banking system and the nationality of its ultimate global parents.⁴³ We then constructed the average deposits-to-liabilities ratio for each subsidiary over the sample period and averaged across affiliates from the same country of origin to obtain a single measure of foreign affiliates' funding structure for each BIS-reporting country.⁴⁴ Lending by foreign banks' affiliates is mostly financed from domestic deposits, and their reliance on non-deposit funding is particularly low in Chile and Mexico (figure 7).

Table 4 presents the estimated coefficients from a specification that includes the three sets of interactions between the global financial variables and the share of local-currency lending, the share of lending by local affiliates, and deposit funding of local affiliates, respectively. The rest of the controls are also included, but they are not reported for ease of exposition. The number of observations obtained for this variable is significantly smaller than the baseline sample (approximately a fourth) for two reasons. First, in countries where all foreign banks' lending is cross-border, this variable is not defined. Second, Bankscope data are sparsely populated for many countries. With these caveats in mind, the results indicate that the transmission of international liquidity strains through the foreign banks' lending channel is attenuated in countries where foreign-owned local affiliates use a higher share of retail deposits as

42. In most Latin American and Caribbean countries, regulations require that domestic banks (including local affiliates of foreign banks) keep both sides of their balance sheets currency matched. Thus, the domestic-currency share of total foreign banks' lending is a reliable indicator of the importance of local sources of funding (except in a few highly dollarized economies like Bolivia, Peru, and Uruguay, where a substantial fraction of local deposits are denominated in foreign currency).

43. We consider a bank to be foreign if it is a branch of a bank incorporated in a foreign country or if it has shareholders settled in a foreign country, holding overall at least 51 percent of the bank capital. Unfortunately, we were not able to obtain chronological information on changes in ownership throughout the period.

44. We were unable to obtain granular data on banks' internal capital markets and wholesale sources of funds (for example, interbank repo market borrowing and other non-deposit funding), information which is not available in Bankscope.

FIGURE 7. Deposit-to-Loan Ratios in Foreign-Owned Local Affiliates

Source: Authors' calculations, based on Bankscope data.

a source of funding.⁴⁵ These results, however, should be treated with caution given that the sample size shrinks significantly when we include the deposit-funding ratio.

The distinct behavior of Spanish banks' affiliates in Latin America during the global crisis provides additional suggestive evidence of the role played by subsidiaries' funding models in explaining the dynamics of global banks' lending. Across foreign banks of different nationality, Spanish banks showed the most resilient lending behavior (in particular compared with U.S. banks, as shown in figure 8). Importantly, overseas affiliates of Spanish banks are required to have financial autonomy from their parent banks in terms of

45. This result is consistent with Ongena, Paydró, and van Horen (2011) and de Haas and van Lelyveld (2013), who show that the cut in foreign banks' lending during the global crisis was stronger for subsidiaries of banking groups that relied more heavily on wholesale funding. Our findings are also in line with Raddatz (2010), who provides systematic evidence of the role of banks' dependence on wholesale funding in the international transmission of the liquidity crunch in September 2008. Raddatz shows that banks that relied more heavily on non-deposit sources of funds experienced a significantly larger decline in market capitalization even after controlling for other determinants of stock prices.

TABLE 4. Determinants of Foreign Banks' Lending to Latin America: Disentangling the Effect of Domestic Funding^a

<i>Explanatory variable</i>	<i>Baseline</i>
<i>TED spread</i>	-0.04** (0.02)
<i>TED spread</i> × Domestic-currency share	-0.01 (0.06)
<i>TED spread</i> × Local affiliates' share	0.03 (0.07)
<i>TED spread</i> × Deposit-to-liabilities ratio	0.05* (0.03)
Parent bank's financial stress	-10.31*** (2.89)
Parent bank's financial stress × Domestic-currency share	28.67* (15.36)
Parent bank's financial stress × Local affiliates' share	-15.73 (16.04)
Parent bank's financial stress × Deposit-to-liabilities ratio	-0.54 (8.52)
Tighter lending standards	0.07* (0.04)
Tighter lending standards × Domestic-currency share	-0.04 (0.08)
Tighter lending standards × Local affiliates' share	-0.02 (0.10)
Tighter lending standards × Deposit-to-liabilities ratio	-0.13 (0.07)
Quarter dummy variables	Yes
Borrower/lender fixed effects	Yes
<i>Summary statistic</i>	
No. observations	1,455
<i>R</i> ²	0.11

Source: Authors' calculations.

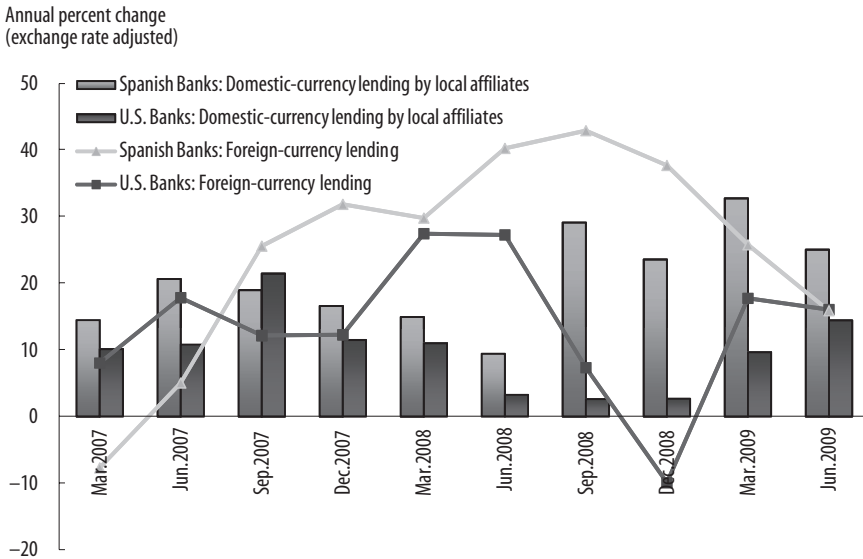
*Statistically significant at the 10 percent level.

**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

a. This table reports the panel fixed-effects regression of an augmented version of equation 2 described in the text. The dependent variable is the quarterly percent change in total foreign banks' lending. The estimation method is panel OLS with fixed effects, and the sample period is from the fourth quarter of 1999 to the first quarter of 2009. The variables Parent bank's financial stress and Tighter lending standards are entered with one lag. The sample used excludes extreme observations, defined to be those below the 2.5th percentile and above the 97.5th percentile of the distribution of percent changes in foreign banks' lending for the whole sample. All other controls are included but not reported. Robust standard errors are clustered at the borrower-country level and are shown in parentheses.

FIGURE 8. Lending to Latin America and the Caribbean: Spanish Banks versus U.S. Banks



Source: Authors' calculations, based on BIS and IFS data.

liquidity, funding their operations in each country with retail deposits—thus operating very much like their domestic counterparts (but with foreign capital). This could have made Spanish banks' locally established offices less vulnerable to contagion from the international liquidity squeeze.⁴⁶

Conclusion

In the years preceding the 2008–09 financial crisis, foreign banks' lending became a significant source of funding in many Latin American countries. After the onset of the global credit crunch, however, foreign banks' liquidity problems and capital shortfalls became a potential feed through which financial stress in advanced economies could spread into Latin American economies. Thus, understanding the specific channels of shock transmission through

46. Along the same lines, Galindo, Izquierdo, and Rojas-Suárez (2010) find that Spanish banks tend to react less than other foreign banks to changes in risk conditions in international capital markets.

foreign banks' lending activities is of key policy interest—not only for those countries that already rely heavily on foreign banks, but also for those that may be considering opening up their markets to international banks' operations.

On analyzing detailed BIS data on credit extended by global banks to twelve Latin American and Caribbean countries, we find that liquidity shortages in the global interbank market and a deterioration in parent banks' own financial soundness had a significant negative impact on foreign banks' lending to the countries in our sample. Our econometric results also indicate, however, that the deceleration (or contraction) in foreign banks' credit was smaller in those countries where a higher share of foreign banks' lending was channeled through their local affiliates in domestic currency. In addition, we find some preliminary evidence suggesting that a higher reliance of local affiliates on domestic deposits as a source of funding could have also muted the transmission of global financial shocks. The latter result should be treated with caution, as it is obtained with a significantly smaller sample than the one used in the baseline specification.

Based on the evidence presented in the paper, we conjecture that some key features of foreign banks' operations in Latin America may explain why the region as a whole was not struck as hard as other emerging markets (most notably, emerging Europe) by the global pullback in foreign bank lending during the recent crisis. First, the relatively low share of foreign banks' total lending denominated in foreign currency in Latin America compared with emerging Europe (40 percent and 60 percent, respectively) reduced the likelihood of financial stress and credit contraction following the steep exchange rate devaluations in the aftermath of the Lehman Brothers event. Second, the share of foreign banks' lending extended cross-border from parent banks was also smaller for Latin America as a whole (30 percent) than for emerging Europe (42 percent), making Latin America less exposed to the risk of a homeward flow of foreign banks' assets. Third, foreign-owned affiliates in Latin America mostly relied on domestic deposits as a source of funding (which were relatively stable during the crisis), as opposed to parent banks' resources or offshore wholesale markets (as was the case in emerging Europe).⁴⁷ Thus, lending by local affiliates was less vulnerable to a sudden pullout of resources from parent banks facing dollar funding strains and regulatory pressure to

47. The average deposit-to-loan ratio for foreign-owned affiliates in Latin American countries was 105 percent at the end of 2008, compared with 75 percent for their peers in emerging Europe (see Adler and Cerutti, 2009). As noted by Porzecanski (2009) and Zettelmeyer, Nagi, and Jeffrey (2010), foreign-owned affiliates in emerging Europe were largely vehicles through which parent banks' resources were loaned out domestically.

build capital. Still, more research is needed to disentangle the role played by global banks' expansion strategies and their affiliates' funding structures in explaining the cross-regional variation in foreign banks' lending during the recent crisis.

Overall, the recent experience of foreign banks' lending to Latin American and Caribbean countries suggests a few lessons for assessing and mitigating the volatility of foreign banks' credit flows, which are relevant to policy discussions regarding the costs and benefits of opening the domestic banking sector to foreign competition. Our results indicate that foreign bank lending that is extended through local affiliates in domestic currency—which is generally funded with local deposits—tends to be more resilient to external financial shocks. Policies to foster foreign bank lending in domestic currency and funded by local deposits could allow emerging market economies to obtain the benefits of global bank lending, while creating more resilient mechanisms of financial integration.

Appendix: Data Sources and Adjustment for Exchange Rate Valuation Effects

The dependent variable is total foreign banks' claims. It is sourced from the BIS (Table 9A: Consolidated Foreign Claims of Reporting Banks in Immediate Borrower Basis), where it is identified as BIS variable code: Q:M:F:B:S:[lender]:[borrower]. The fourteen BIS-reporting countries considered in the econometric estimation are Australia, Austria, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, United Kingdom, and United States.

The sources used for the explanatory variables are as follows:

—*TED_spread*: $(LIBOR_{3m} - US\ TBill_{3m}) * 100$. Averaged over monthly frequency to obtain quarterly data.

—*LIBOR_3m*: Three-month London interbank offer rate: Based on U.S. dollars (in percent). Haver code: FLOD3@USECON.

—*US TBill_3m*: Three-month U.S. Treasury bill market bid yield at constant maturity (in percent). Haver code: FCM3M@USECON.

—*EDF*: Median value of the expected probability of default (one year ahead), across all internationally active banks within each BIS-reporting country. Source: own calculations, based on Moody's KMV Credit Edge.

—*Lending standards*: Net percentage of banks reporting tightening standards for loans. Source: Bank of Japan; European Central Bank; U.S. Federal Reserve; and IMF staff estimates.

—*Exchange rate*: End-of-period exchange rate for the borrowing country, in domestic currency per dollar. Source: International Financial Statistics (IFS), IFS code [IFS countrycode]. .AE.ZF . . .

—*Composite risk rating*: From International Country Risk Guide (ICRG). Averaged over monthly frequency to obtain quarterly data.

BIS data on total foreign banks' claims correspond to end-period values, expressed in U.S. dollars. Thus, changes in the stock of foreign banks' outstanding claims incorporate mechanical exchange rate valuation effects and so may differ from net lending flows. To express changes in total foreign claims in exchange rate-adjusted terms, we adjust the local currency-denominated portion of foreign banks' claims using a nominal exchange rate index for each country with base year 2005:4. This adjustment is used in figure 6. To obtain the amount outstanding of foreign banks' claims that is in domestic currency, we used local claims by local affiliates (BIS Table 9AL: Local-Currency Claims on Local Residents—on Immediate Borrower Basis). We did not perform any valuation adjustment on the stock of international claims, as the BIS does not provide information on the breakdown by individual foreign currencies.

Comment

María Soledad Martínez Pería: This paper examines the behavior of foreign bank claims on Latin America during the period 1999–2009. The stated goal of the paper is to “explore how the global financial shocks were transmitted to Latin American countries through the foreign bank lending channel.” Using quarterly data on foreign bank claims provided by the Bank for International Settlements, the authors conduct an econometric analysis of the determinants of foreign claims on twelve Latin American countries. In particular, they assess the effects of three factors that characterized the recent global crisis: the collapse of international money markets, the worsening financial health of parent banks in advanced economies, and tighter lending standards in developed countries’ banking systems. To identify possible mitigating factors, the authors exploit differences in the geographic structure (cross-border versus local affiliates) and currency mix (foreign versus domestic) of foreign bank lending to Latin America, as well as differences in the funding structure (retail versus wholesale) of the foreign affiliates. The results confirm that all three factors that characterized the global crisis affected the behavior of lending to Latin America. Furthermore, the findings indicate that the propagation of the crisis was more muted in countries where foreign banks conducted a higher share of their lending through their local affiliates in local currency and where local affiliates relied more heavily on local funding.

While this paper offers a nice first analysis of the behavior of bank lending to Latin America in 1999–2009, I would have liked to see more evidence and at times a different approach to complement the results of the paper. I discuss my suggestions below.

First, the sample used in the estimations includes a tranquil period and a crisis period, and mixing the two up is not very informative about the behavior of claims during the global crisis. It would have been interesting to see the

authors compare the determinants of foreign bank lending in the period before and during the crisis.

Second, the estimations combine many borrower and lender countries. For the crisis period, it would have been interesting to assess whether results are sensitive to excluding certain countries or to test formally whether some countries are very different from others. For example, toward the end of the paper the authors suggest that Spanish banks are different from other lenders, but they never formally test this. Given that the crisis started in the United States, it would have been nice to see the extent to which U.S. banks behave differently from the rest.

Third, though the authors try to include the role of funding in their estimations, the limited analysis of this issue is disappointing given how much attention it has received in the literature. It is not clear why the authors only focus on the funding structure of the affiliates of foreign banks and not on foreign bank funding in general, as has been the case in other papers.¹ The authors claim that they have a limited number of observations for retail funding, but this is because they only focus on the foreign bank affiliates, and this variable is not defined in the case of countries that receive only cross-border claims. However, the authors could have examined the impact of the ratio of deposits to total liabilities at the parent bank level.

Third, the results are based on regressions with very low explanatory power (in tables 2 and 3 the *R* squared is never above 0.04). This is probably due to the use of quarterly data, which are very noisy. It would have been nice to see if the results held using annual data.

Fourth, the authors use a static framework to conduct their estimations, yet it would have been very interesting to explore the dynamics during the crisis. This could have been done using a panel VAR model which would allow the authors to show impulse response functions, for example, to illustrate the impact of different shocks on foreign bank lending.

Finally, at times the authors state that foreign bank lending to Latin America was more resilient than lending to other regions. While this might be true, this is not something the authors are able show with their estimations, and it remains an important question for future research.

1. See, for example, Claessens and others (2010); Raddatz (2010); Cetorelli and Goldberg (2011).

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