

## **COVER PAGE**

Paper title: Flight Home, Flight Abroad and International Credit Cycles

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Session title: The International Transmission of Financial Shocks: Bank-Level Evidence from the 2007-2009 Crisis

Session chair: Erik Berglof (EBRD)  
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Abstract: This paper shows that banks exhibit a weaker (stronger) home bias in the extension of new loans when funding conditions in their home country improve (deteriorate). We refer to these changes in home bias as *flight abroad* and *flight home* effects, respectively, and show that they are unrelated to the better known flight to quality effect that arises during periods of market turmoil. Our results also indicate that global banks amplify the effect of home-grown shocks on foreign countries while they are a stabilizing factor for the supply of credit in their home countries.

## **Flight Home, Flight Abroad and International Credit Cycles**

By Mariassunta Giannetti and Luc Laeven\*

A large literature has studied how banking shocks are transmitted internationally and affect the supply of bank loans abroad during banking crises. For example, Peek and Rosengren (2000) show that U.S. subsidiaries of Japanese banks contracted lending in the U.S. during the Japanese banking crisis, and Giannetti and Laeven (forthcoming) show that banks that are adversely affected by banking crises in their home markets decrease the proportion of foreign loans.

It is less studied how shocks are transmitted internationally under less extreme financial conditions, for instance when the stance of monetary policy or banks' funding conditions change. By going abroad, banks not only expose themselves to foreign shocks but may also transmit home-grown shocks to the host country. The internationalization of banking could therefore amplify international credit cycles. However, banking globalization can decrease the cyclicalities of local credit by improving risk sharing. For example, Cetorelli and Goldberg (forthcoming) show that U.S. multinational banks obtain liquidity from their foreign subsidiaries during periods of monetary tightening, and that these internal capital markets render the supply of loans from these global banks less sensitive to changes in domestic monetary policy. The impact of the internationalization of banking on the cyclicalities of cross-border banking flows is thus ultimately an empirical question.

In this paper, we show that the geography of bank lending matters for the propagation of financial shocks and that international banks amplify international credit cycles.

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Specifically, we consider shocks to the supply of credit arising from changes in the banks' cost of funding, similar to Kashyap and Stein (2000).<sup>1</sup> We then show that funding conditions in the countries of origin of international banks affect the relative amount of domestic and foreign loans of these banks. Banks grant a higher (lower) proportion of foreign loans, when they have easier (more difficult) access to funding either because the valuation of bank stocks in their home country is high (low) or because the spread in the interbank market is particularly low (high).

Our findings suggest that the extent of integration of the banking system is time-varying and that banks exhibit a weaker (stronger) home bias in the extension of new loans during good (bad) times. This in turn implies that there exist waves in the extent to which international banks participate in the international credit market. We refer to such increases in the home bias of international lending when funding conditions deteriorate as a *flight home* effect and to decreases in the home bias when funding conditions improve as a *flight abroad* effect.

Our results also indicate that global banks amplify the effect of home-grown shocks on their host countries. If international banks would transmit shocks without amplification, then we would simply find that banks change the supply of domestic and foreign loans similarly when their funding conditions change. However, if the proportion of foreign loans offered by international banks decreases following a negative shock, a high penetration of international banks in a country may lead to higher volatility in the supply of credit in that country. We provide empirical evidence consistent with this notion: Not only is the volatility of credit higher in countries in which international banks extend a larger proportion of loans, but in the home countries of international banks the volatility of bank credit is lower, as is

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<sup>1</sup> While Kashyap and Stein (2000) study the effect of changes in policy interest rates on the domestic supply of credit, we explore how changes in market conditions in the bank's country of origin affect credit supply abroad.

consistent with the finding that international banks adjust their foreign loan portfolio to a larger extent than their domestic loan portfolio.

## I. Bank Lending and Domestic Funding Conditions

Most of our analysis relies on the syndicated loan market for two reasons.<sup>2</sup> First, this is a large and internationalized market for corporate loans. Second, and most importantly, we have detailed loan-level data from Loan Analytics, a dataset provided by Dealogic, on the geographical distribution of banks' syndicated loans, allowing us to study how a bank's propensity to extend foreign loans depends on local funding conditions.<sup>3</sup>

We focus on the share of syndicated loans originated by bank  $i$  to borrowers in country  $j$  during month  $t$  as follows:

$$\text{Loan share}_{ijt} = \alpha_0 + \alpha_1 \text{Funding conditions}_{it-1} + \Gamma X_{ijt} + \varepsilon_{ijt}$$

We consider only the proportion of loans extended in foreign countries; that is,  $i \neq j$ .

*Funding conditions<sub>it</sub>* in the home country of the bank is measured either using the median value of the market to book ratio of equity of banks in country  $i$  at the end of the previous year or the average spread in the interbank market over the overnight swap rate (or policy rate) in country  $i$  during month  $t$ . The use of the market to book ratio as a proxy for funding conditions is motivated by studies indicating that firms can issue equity at lower cost when market valuations are higher (see, for instance, Pagano et al., 1998 and Baker, Foley, and Wurgler, 2009). Similarly, the interbank market represents an important source of short-term funding for banks. The matrix of controls  $X_{ijt}$  includes interactions of host country and year fixed effects.

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<sup>2</sup> Several papers have studied this market. Ivashina and Scharfstein (2010a) show that reductions in bank capital during the 2008 financial crisis negatively affected the supply of syndicated loans in the United States, and Ivashina and Scharfstein (2010b) show that originating banks retain a larger fraction of syndicated loans during economic downturns, increasing the cyclical nature of credit supply in this market.

<sup>3</sup> See Giannetti and Laeven (forthcoming) for a more detailed description of the data.

The share of syndicated loans issued by bank  $i$  to borrowers in country  $j$  will naturally depend not only on the supply of loans but also on demand effects. We abstract from differences in demand across countries in our regression analysis by including interactions between year and host country fixed effects. Thus, in practice, we compare how the proportion of loans that international banks extend to country  $j$  varies depending on the banks' funding conditions in their home country  $i$ . It is also important to note that being standardized by the bank's supply of loans during month  $t$ , our dependent variable is unaffected by shocks that change the bank's overall supply of loans and instead captures the geographic distribution of new loans. Since banks' portfolio allocation exhibits geographical specialization and is therefore correlated over time, we cluster standard errors at the bank level.

Table 1 shows that banks increase the proportion of foreign loans they extend as the market to book in the banking industry of their home country increases.<sup>4</sup> Similarly, an increase in the spread banks pay in the interbank market is associated with a decrease in the proportion of foreign loans. The economic effects are large. A one standard deviation increase in banks' market-to-book value (reduction in interbank spreads) increases (decreases) the proportion of foreign loans by nearly 5 percentage points, which is large compared to its standard deviation of slightly less than 40 percentage points. These effects indicate that the extent of home bias in international bank lending varies with bank funding conditions. Importantly, our estimates remain at least as large if we exclude periods in which the home country of the bank experiences a banking crisis. There appears to be a flight abroad when banks' funding costs are low and a flight home when funding conditions worsen.

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<sup>4</sup> Giannetti and Laeven (forthcoming) show that syndicate composition varies similarly for syndicates led by domestic and foreign banks. Thus our results cannot be interpreted to depend on changes in syndicate compositions.

These flight home and flight abroad effects are distinct from flight to quality. Specifically, banks may prefer to invest in lower risk assets when they face tighter funding conditions. To the extent that the UK and especially the US can be considered safe havens it is possible that our estimates are entirely driven by US and UK banks that invest more at home when market conditions deteriorates. However, we find that this is not the case. Our results are if anything stronger when we exclude the US and the UK. Moreover, we find that the flight home and flight abroad effects are more pronounced for host countries with stronger creditor rights, that is, countries that should be considered safer.

Table 1—Share of Foreign Loans and Funding Conditions

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Full	Full	Excluding	Excluding	Creditor	Creditor
Share of foreign loans	sample	sample	UK and US	UK and US	rights	rights
Market to book	0.07*** [0.02]		0.11*** [0.02]		0.06*** [0.02]	
Interbank spread		-0.08*** [0.02]		-0.09*** [0.02]		-0.10*** [0.02]
Creditor rights spread					-0.06*** [0.01]	-0.01 [0.01]
Creditor rights spread × Market to book					0.04*** [0.01]	
Creditor rights spread × Interbank spread						-0.01 [0.01]
Observations	37,931	36,509	24,776	23,093	21,928	21,738
R <sup>2</sup>	0.27	0.28	0.36	0.34	0.28	0.24

*Notes:* The dependent variable is the proportion of syndicated loans originated to borrowers in a given country. Regressions are at the bank-country-month level. The sample period is 1997-2009. Creditor rights spread is the difference between creditor rights in the host country of the borrower and creditor rights in the parent country of the lender. Each regression includes year times host country fixed effects. Robust standard errors are reported in brackets, with standard errors clustered at the bank level. \*\*\* Significant at the 1 percent level. \*\* Significant at the 5 percent level. \* Significant at the 10 percent level.

## **II. The Geography of Bank Lending and International Credit Cycles**

The flight home and flight abroad effects may have important macroeconomic effects on the availability of business credit in the host countries of international banks. To provide suggestive empirical evidence on these issues, we measure credit cycles as deviations of real credit per capita from its trend, computed using a Hodrick-Prescott filter on yearly data with a smoothing parameter of 100.<sup>5</sup> We then consider how the cross-sectional volatility of credit around its trend in a given country varies with the geography of bank lending.

The flight home and flight abroad effects are relevant from a macroeconomic point of view if the home countries of international banks experience a less pronounced variation in the supply of loans because banks are more inclined to adjust the supply of foreign loans when their funding conditions change. We thus expect a lower volatility of business credit around its trend for countries that are home to banks with a large proportion of foreign loans, which we proxy for using the proportion of foreign loans in the syndicated loan market of banks in that country. By converse, we expect that countries where a larger proportion of loans is supplied by foreign lenders, which again we proxy for using the proportion of syndicated loans supplied by foreign banks in that country, experience a higher volatility in business credit.

Table 2 indicates that a higher proportion of loans supplied by foreign banks is associated with a higher volatility of credit around its trend in the host countries, both when we consider international syndicated loans and when we consider the total credit extended to the private sector as measured using data from the International Financial Statistics database of the International Monetary Fund. The proportion of loans supplied by foreign banks explains nearly 40 and 20 percent of the volatility of credit in the two specifications,

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<sup>5</sup> We rely on real credit per capita because this allows the credit cycles to be disconnected from the dynamics of GDP.

respectively. In the latter specification, we also find that the volatility of credit around its trend is lower in the home countries of banks that extend a higher proportion of foreign loans. The economic effect is large as this variable explains nearly 30 percent of the variation of the dependent variable.

Clearly, credit cycles depend on both the demand and the supply of credit. To explore whether the geography of lending matters also after we incorporate these features in our analysis, we focus on the amplitude of the cycles. In particular, we capture the size of credit expansions and contractions by cumulating the deviation of credit from its trend during credit expansions and contractions, respectively. We then consider how the degree of internationalization of the supply of credit is associated with the amplitude of credit expansion and contractions in the host country, controlling for variables that capture economic conditions in the host market.

We expect a larger reduction (increase) in the supply of credit when the cost of funding in their lenders' home market increases (decreases). We measure a country's exposure to foreign banks' funding costs (proxied using banks' market to book ratio or the interest rate spread in the interbank market) using the sum over all countries of the proportion of loans that banks from a given country provide to the country of interest times the relevant proxy for funding condition. We compute the exposure to the funding costs of foreign banks at the beginning of each expansion or contraction. This exposure is naturally closer to zero if a larger proportion of loans in the country is extended by domestic banks and is larger if a larger proportion of loans is extended by (foreign) banks in countries with higher market to book ratios or interest rate spreads, with funding costs increasing in interest rate spreads and decreasing in market to book ratios. We control for the volatility of real GDP growth in the country, which captures changes in demand, and also for banks' funding conditions in the

host country. Since financial cycles tend to be synchronized across countries we include year fixed effects and cluster errors across years.

We find that the funding conditions in the home countries of the foreign banks at the beginning of credit expansions and contractions matter for the amplitude of credit expansions and contractions in host countries, with the cost of equity financing in the bank's home market mattering more during good times and funding costs in the interbank market mattering more during bad times. Specifically, countries experience larger credit expansions when the weighted average of the market to book ratio in the home countries of the lending banks is higher, and countries experience larger credit contractions when the weighted average interbank interest rate spread in the home countries of the lending banks is higher. Importantly, the funding conditions of foreign banks explain approximately 10 percent of the variation in the amplitude of cycles, an economic effect that is similar in magnitude to the explanatory power of demand and funding conditions in the lending banks' home countries. Finally, we find that credit expansions are smaller if domestic banks extend a larger proportion of loans abroad at the beginning of the expansion. However, we do not find an analogous countercyclical effect of domestic bank lending abroad during credit contractions.

Table 2. Foreign banks and the cyclicality of lending

Dependent variable:	Volatility of cyclically-adjusted syndicated loans per capita	Volatility of cyclically- adjusted private credit per capita	Amplitude of lending expansions	Amplitude of lending contractions
Share of loans from foreign banks	0.67*** [0.12]	0.07* [0.04]		
Share of loans from domestic banks extended abroad	0.03 [0.11]	-0.07** [0.03]	-0.22** [0.09]	0.03 [0.15]
Exposure to foreign banks with high market to book values			0.01* [0.01]	

Exposure to foreign banks with high interbank spreads		0.02*** [0.01]
Market to book value of banks	0.06** [0.02]	
Spread between interbank rate and policy rate		-0.03** [0.01]
Volatility of real GDP growth	0.02** [0.01]	0.04*** [0.01]
Observations	86	74
$R^2$	0.13	0.16
	116	88

Notes: The dependent variable is, respectively, the standard deviation of the deviation from trend of the logarithm of syndicated loans per capita in real terms, the standard deviation of the deviation from the trend of the logarithm of private credit per capita in real terms, the cumulative deviation from the trend of the logarithm of syndicated loans per capita in real terms over the years of a cycle during which this deviation from the trend took on positive values (expressed in percentages), or the cumulative deviation from the trend of the logarithm of syndicated loans per capita in real terms over the years of a cycle during which this deviation from the trend took on negative values (in absolute values and expressed in percentages). Deviations from the trend are computed using an HP filter with smoothing parameter of 100. The sample period over which the above variables are computed is 1997-2009. All regressions are estimated using OLS. The first two regressions are at the country level and the last two regressions are at the country-cycle level. Robust standard errors are reported in brackets. The last two regressions include time fixed effects with standard errors clustered by year. \*\*\* Significant at the 1 percent level. \*\* Significant at the 5 percent level. \* Significant at the 10 percent level.

### III. Final Remarks

It is generally believed that large capital flows may increase the risk of banking crises (see, for instance, Reinhart and Rogoff, 2009). This paper shows that also the internationalization of banking activities is related to the magnitude of credit cycles and that foreign banks export shocks in their home countries to their host markets.

The mechanism underlying these macroeconomic effects on the aggregate supply of credit is that the extent of home bias in the issuance of new loans changes with the funding

conditions of the bank. It remains to be understood whether this phenomenon is the natural consequence of decreasing returns to geographical diversification in banking or whether it is driven by a time changing appetite for risk and international diversification. We believe that this is an exciting area for future research.

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