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ABSTRACT

Deglobalization of Banking: The World is Getting Smaller*

Banks have been running for home. We investigate the pattern of this increasing home bias in the wake of the financial crisis and explore possible explanations. We estimate the strength of the flight home effect as the change in domestic credit extended by domestic banks that cannot be accounted for by recipient or lender effects. We find evidence of flight home for almost all banking systems with the notable exception of the US and Japan. In periods of calm, reversals of the home bias are small. The result is cumulative renationalization, with domestic lending growing on average 25% more than foreign lending during 2008-12. Sales and acquisitions of banks contributed to the home bias and the flight home was strong at the intensive margin as well. Deterioration of bank soundness explains some but not all of the effect, e.g. Germany and Switzerland had a strong flight home notwithstanding improving bank soundness during the eurocrisis. We also find evidence of the vicious circle between banks and sovereign balance sheets: sovereign stress paired with banking stress contributed to the renationalization of banking.

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Introduction

One of the most striking features of global financial crisis is that international banking has shrunk dramatically since its onset. Commercial banks have withdrawn from foreign operations, shedding cross-border assets and closing foreign branches. Foreign claims fell from \$30 trillion in June 2008 to \$25 trillion 6 months later, and have hovered around that level since (BIS data). If the decline in foreign claims was paired with a decline in domestic assets, it would merely be a symptom of a general retrenchment by banks which needed to shed assets as a result of the crisis. However, the decline in foreign claims has been accompanied by an *increase* in banks' domestic assets in most countries (figure 1). It would seem that banks have been running for home.²

This paper proposes a methodology to estimate this increase in home bias of banking and provides country-by-country measures of the size of the effect. The flight home effect cannot be simply be gaged based on the share of bank assets held domestically/internationally. Country-specific effects need to be controlled for. Indeed, a country may be an attractive investment destination, and as a result that country's banks would naturally repatriate assets. The increasing share of domestic assets in its portfolio would in this case not reflect a flight home effect, but simply the fact that the home country offers better expected returns (a flight to quality).

We estimate the strength of the flight home effect based on a panel of data on foreign claims of BIS reporting banks, which has the advantage of capturing all bank assets, and thus is appropriate to estimate the overall pattern of flows both at home and abroad. Specifically, the data covers equity and bond holdings and also captures changes in exposures of lenders through sales and acquisitions of banks. We make adjustments to the data to ensure that we measure true lending flows, rather than the effect of changes in coverage or exchange rate changes. We supplement this data with data on domestic lending by banks.

We calculate how different domestic bank lending is domestically compared to what could be expected based on how the country is viewed by foreign bank lenders (the recipient effect) as well as based on the country's own behavior as a foreign lender (the lender effect). The flight home effect captures how differently banks behave when the recipient is their own country rather than a foreign one. Suppose there is a concern about solvency or exchange rate redenomination for a particular recipient. The recipient effect will capture foreign lenders' response to these risks. If domestic lenders respond differently from foreign lenders, this will be reflected in a change in home bias. In addition, using dummy variables to control for lender effects allows us to control for unobserved variables on the lender side, whose exclusion might otherwise bias the results. We estimate recipient, lender and the flight home effect for 6 month periods starting in June 2008 and extending through June 2012.

² In the emerging literature this observation has alternately been called "a flight home effect" (Giannetti and Laeven, 2012) or alternately a "re-domestication" (Atkins and Fray, 2013).

A second contribution of the paper is the investigation into the causes of the flight home effect. Was it stronger in countries where banks had stronger international exposures? For countries facing banking crises? Was it related to stress on the own sovereign and associated with purchases of own sovereign bonds?

Our main findings are (1) overall, there was a flight home since the onset of the global financial crisis for most lenders (the exceptions being Canada, Japan, and the US); (2) the flight home effect was strongest in periods of greatest concern about the health of banking systems: the peak of the global financial crisis (second half of 2008); the period of greatest concern about the Greek crisis (2010); and the peak of the EZ crisis (second half of 2011); in periods of calm, reversals of the flight home are small; as a result, we experience cumulative de-globalization of banking; and (3) the flight home effect was systematically higher in countries where banking systems were more internationally active; in countries where bank soundness deteriorated most; and in countries with a systemic financial crisis combined with large increases in bank holdings of government debt. While deteriorating bank soundness explains part of the flight home, the effect was very strong in some countries (Germany and Switzerland) where bank soundness was improving. Sovereign and country risk ratings of lending countries did not seem to systematically affect the flight home.

The remainder of the paper is organized as follows. Section 1 starts with a review of findings in the literature on bank behavior in times of crisis, which bear on the flight home; it then discusses different empirical estimation approaches and places our approach in the context of the existing literature. Section 2 presents the findings and various extensions.

1. Idea and Literature Review

1.1 Explanations for bank behavior in times of crisis

The literature has put forward several explanations for bank asset allocation in time of crisis, which could lead to an increase in home bias. Some of these explanations point towards temporary effects while others suggest structural changes.

One temporary effect would be if the flight home simply reflects *safe haven effects*. Indeed, the literature suggests that at times of crisis investors favor transparent (Gelos and Wei, 2005) and geographically close countries (Ahrend and Schweltnus, 2012, De Haas and Van Horen, 2012), as well as lenders whom they know well (De Haas and Van Horen, 2012). These effects can be understood with reference to the stronger role of asymmetric information at times of high uncertainty.

An alternative explanation for the reduction in international assets is that international banks disproportionately fund themselves from *wholesale funding*—which has shrunk dramatically since

2007/8. To the extent that domestic lenders rely less on wholesale funding, this could cause an increase in home bias which would also prove to be temporary.

Another possibility is *home country financial protectionism*, itself born from the global financial crisis. Financial protectionism could take several forms: (a) measures taken in the name of protecting domestic tax payers and depositors, and safeguarding domestic lending (Goldberg and Gupta, 2013) and (b) preferential treatment of domestic financial institutions and borrowers relative to their foreign competitors. As Lund et. al. (2013) note “Banks remaining active in foreign markets are encountering a changed regulatory landscape. During the crisis, many countries found their own taxpayers bailing out banks that failed due to foreign operations, or insuring depositors from failed foreign institutions. As national regulators move to contain these risks, their actions could slow the bank-induced share of cross-border capital flows.” Another legacy of the global financial crisis is a shortage of bank capital, in particular in Europe, as the result of EU bank exposures to sovereign debt at risk of default and increased capital requirements. In this context banks would tend to shed assets, while home regulators might react by pressuring banks to reallocate lending domestically and by preventing foreign banks from tapping local deposits for use in lending outside the country.

Financial protectionism can take a number of specific forms. First, regulators can affect domestic lending through explicit conditionality of rescue packages (UK, France, Netherlands). More subtly, banks can repatriate of their own free will, knowing that the likelihood of a bailout depends on the extent of local lending both to the private sector or the own government as emphasized in the literature on the “doom loop” between sovereigns and banks (Acharya and Steffen, 2013, Garicano and Reichlin, 2013, Battistini et. al., 2013, Farhi and Tirole, 2014). Second, regulators can impose tough requirements on foreign bank affiliates for accepting deposits, including the requirement to hold liquid assets in reserve in the country and to fund their operations locally (“Net Due Restrictions”, see Goldberg and Gupta); they can also insist on subsidiarization (i.e. insist that foreign branches of international banks in their countries become subsidiaries instead, with separate capital, liquidity and host country supervision). The aim of the regulator in these cases is to “ring-fence” domestic operations, to protect domestic depositors and businesses from difficulties spilling over from abroad. Foreign banks not able or willing to comply might react by closing their foreign branches altogether. Finally, regulators can legislate tough licensing and information requirements on foreign banks for engaging in relationships with their nationals (Frank Dodd Act amendment to US Investor Advisory; FATCA). Goldberg and Gupta note that many countries (including Germany, the UK, US, and Switzerland) are considering further actions to ring-fence domestic operations and other forms of financial protectionism. At any rate, these type of explanations for bank reallocation of assets towards home would suggest that the effect might be permanent or at least persistent.

1.2 Approach in the Empirical Literature

In the empirical literature on bank asset allocation in crisis times, asset allocation is linked to recipient and lender characteristics, and sometimes also bilateral variables and global factors (the latter, when the panel spans different periods).

$$\Delta E_{ij} = f(X_i, Y_j, G_t, Z_{ij}, self, interaction\ terms)$$

- ΔE_{ij} proxy for change in exposure from a lender to a recipient, possibly scaled by total exposure of the lender or expressed as a percent change (alternatively, the focus can be on exposure itself rather than the change in exposure)
- X : recipient characteristics (GDP growth, stock market performance, credit risk, investor protection, etc... or recipient fixed effects)
- Y : lender effects (bank ratings, banking crisis dummy, exposure to crisis countries/common lender effects, reliance on wholesale funding, past lending growth etc. or lender fixed effects)
- Z : bilateral variables (distance from lender, bilateral trade etc, risk/return differentials between lender and recipient, prior lending experience, network of domestic co-lenders, presence of subsidiary, being a core “funding market” or “investment market”³ etc.)
- G : global factors (risk aversion, etc. or time dummies)
- $Self$: dummy for whether loan is to a domestic or a foreign entity

This type of equation has been estimated on four types of data: BIS banking statistics (locational and consolidated; immediate borrower and ultimate risk), single country sources, syndicated loans databases and a database of lending differentiating between foreign subsidiaries and domestic banks. Much of the work on the impact of international shocks on global banking has focused on foreign lending only, the exceptions being work by Giannetti and Laeven (2012) and De Haas and Van Lelyveld (2011).

The literature has found a role for most variables in the equation. We have already referred to the evidence by De Haas and Van Horen (2012) on geographic closeness and closeness of the lending relationship. The authors find relative stability of international bank lending to repeat borrowers,

³ Cetorelli and Goldberg (2012) use confidential data filed by US banks to the Federal Financial Institutions Examinations Council on internal flows between parent banks and affiliates to define these markets. They find that the parent draws on “core funding markets”-- affiliates that rely to a greater extent on local finance as opposed to internal finance-- and “periphery investment markets”-- affiliates who account for a small share of assets of the group--in times of funding difficulties (the USD funding shock in 2007Q3-Q4). The reverse happens in the face of a positive funding shock (Term Auction Facility introduction in 2008Q1-Q2).

when international banks participated in syndicated loans with domestic co-lenders, and to lenders with smaller cultural and institutional distance (those who share a common language, have a similar amount of information on creditors and similar creditor protection). Lending was also relatively high for international lenders with subsidiaries in the host country.

Many papers find evidence on the role of lender bank health, building on Peek and Rosengren (1997), who linked lending of Japanese subsidiaries in the US to the capital of Japanese banks.⁴ Similarly, the role of global risk and volatility in bank lending seems established (see Herrmann and Milhaljek, 2010 for a literature review and evidence spanning the period since the Mexican crisis).

De Haan and Van Lelyveld (2011) provide some evidence on the role of dependence in wholesale funding in shrinking foreign lending. The angle they take is to compare lending by multinational subsidiaries and domestic banks in the same countries. That is they look at local lending by international subsidiaries, not cross-border lending, of international banks. In the raw data, loan growth is 6% less for international subsidiaries than for domestic banks (6% versus 12%) during 2008-9. The authors suggest that the reason for this is the reliance of subsidiaries on parent banks which in turn depend on wholesale funding which dried up during the crisis.⁵

In earlier work on the flight home effect, Giannetti and Laeven (2012) approached the question of the flight home at the bank level. They regressed the share of a bank's syndicated loans to a given country on the interaction term of home country banking crisis and a dummy indicating whether a loan is to a foreign country (syndicated loans database).⁶ They found that banks have a 20% increase in home bias when their country is experiencing a banking crisis. Furthermore they find that such banks do not discriminate across foreign recipients in their flight home (EM vs advanced recipients; ICRG ratings on Law and Order of recipients; creditor rights; sovereign ratings do not make a difference for the strength of repatriation). The authors also explore the reasons for the flight home: increasing bailout chances and conditionality of bailout packages. On the role of potential bailouts, they find that large banks have a less pronounced flight home, which the authors believe is consistent with the role of bailouts, since large banks can expect a bailout anyway. On the role of

⁴ McGuire and Tarashev (2008) link BIS data on lender-recipient pairs for the period 2003-2008 to various aspects of bank balance sheets (notably bank equity returns and banks' average expected default frequencies). Avdjiev, Kuti and Takats (2012) relate aggregate borrowing by a recipient country to indices of the average health of the banking systems from which they borrow (based on CDS spreads and financial sector equity price volatilities). They find that the contraction in cross-border bank lending in 2008-9 was largely the result of the deteriorating health of euro area banks, rather than recipient country fundamentals (GDP growth and ratings). Various authors show the presence of "common lender" effects (e.g. Van Rijckeghem and Weder, 2003, and Hermann and Milhaljek, 2010, more recently). Cetorelli and Goldberg (2011) based on confidential BIS data find that banking systems relying on USD funding reduced foreign exposures more than others during the global financial crisis.

⁵ Regression analysis covers the period 1992-2009.

⁶ Specifically, the authors regress syndicated loans issued in a given month by a given bank to a given country (as a share of the bank's total loans) on a dummy for whether the loan is a foreign loan, interaction terms of this foreign loan dummy with recipient country factors, interaction terms of this dummy with lender country factors, and control variables. The coefficient on the dummy is a measure of home bias, and the coefficient on the interacted dummy is an indicator of the change in home bias at times of shocks. To test for the presence of flight to quality, the authors interact the foreign loan dummy with systemic banking crisis and proxies of quality. The period spans 1997-2009.

conditionality, the authors find that banks in which the government intervened do not have a stronger flight home effect, contrary to what one might have expected.⁷

The discussion of the flight home is one set in a context of *shocks to the main lending countries*. One set of results worth highlighting is the difference in reaction between domestic and international banks when the shock originates in *recipient countries*. The literature suggests that international banks (in contrast to domestic banks) maintain their lending in response to adverse shocks in recipient countries (De Haas and Van Lelyveld, 2010, Bofondi et. al., 2013, Giannetti and Laeven), thus acting in a stabilizing way—a bright side of global bank lending.

1.3 Our Empirical Approach

Our approach can best be seen as the addition of an observation on *domestic* bank lending to the BIS database (which covers foreign claims only). We then define the flight home effect as the change in exposure to the home country over and above what would be expected based on the home country's quality as a recipient and its willingness and ability to lend as a lender. Our framework does not specify specific variables for recipient characteristics and lender variables, but instead allows for a general specification with fixed effects for recipients and lenders. Our approach is in essence a sophisticated way of measuring deglobalization—controlling for recipient effects, rather than using readily available data such as the share of foreign assets in total bank assets. To illustrate one insight of this approach, consider the following example. Figure 1 showed that the US behaved similarly on foreign and domestic lending, so at first sight it might seem like there was no flight home effect. As we will see, however, the US was a favored recipient during the period as a whole, so if US banks acted at home the way foreign banks acted towards the US, the US would have increased its domestic exposure more than its foreign exposure. However, it did not. This means there was a negative flight home effect for the US. Banks lent less at home than expected.

Our regression analysis proceeds in two stages. In the first stage we identify recipient, lender and self-lender effects. In the second stage we investigate which factors best explain these effects.⁸

First stage regression:

$$\Delta E_{ij} = \alpha_i \cdot i.recipient \times E_{ij} + \beta_j \cdot j.lender \times E_{ij} + \gamma_j \cdot j.self \times E_{ij}$$

⁷On the other hand, Rose and Wieladek (2013) find that some forms of government intervention has been associated with increased home bias. The authors use British data encompassing both British and foreign bank lending for 1997Q3-2010Q1 and using bank and period fixed effects, and find that foreign banks (though not British ones) nationalized at some point in the past have a stronger home bias. To a lesser extent this is also true for banks that have received a liquidity injection.

⁸The idea of a two-stage set-up was inspired by a comment by Romain Ranciere implemented in Cetorelli and Goldberg (2011).

- E_{ij} --exposure of country i to country j , as a percent of total international and domestic exposure
- *i. recipient*: recipient effects
- *i.lender*: lender effects
- *i.self*: self-lender or flight home effects
 - the difference between what we observe and what we expect for domestic lending given the quality of the country as a recipient internationally and ability/willingness to lend as a lender internationally.
 - adding this effect in the form of dummies for individual lenders has no impact on the recipient and lender coefficients).
- For 6-monthly periods starting in 2008q2 and the entire period June 2008-June 2012
- The interpretation of the coefficients is the percent change in exposure to a particular country (see this by dividing by E_{ij}).

Second stage regressions:

- Regress coefficients from previous regressions (α , β , γ) on fundamentals

$$\delta = a + bX \quad \text{with } \delta = (\alpha, \beta, \gamma)$$
 - α_i on measures of quality of recipient
 - β_i and γ_i on lender country factors
- Consider 2 periods: the initial stage of the global financial crisis (2008h2) and the EZ crisis (2011h2)

Including recipient fixed effects is necessary to ensure unbiased coefficients for lender effects. In essence, recipient effects control for loan demand and other characteristics of recipients which might otherwise appear as lender effects.⁹

We estimate our first stage regression with OLS with robust standard errors, to correct for heteroscedasticity and serial correlation. Both are likely to be present. To minimize heteroscedasticity we express the change in exposure as a share of total initial exposure of a lender (the sum of foreign and domestic exposure). The alternative would be to use growth rates for exposure, however percent changes can be huge when initial exposure is small. Nevertheless,

⁹ As shown by Kwaja and Mian (2008). Cetorelli and Goldberg (2011), amongst others, apply the methodology.

because recipients and lenders are active internationally to different extents, some heteroscedasticity remains in the data. As for serial correlation, while there is no time dimension, outliers might cause serial correlation of the error terms (e.g. breaks in data affect individual pairs, domestic lending stands out). Cluster estimation at the level of lenders did not seem appropriate because errors are not homoscedastic within lenders, owing to the presence of the self-lender.

Our data come from various sources. We use foreign claims (cross-border claims plus local claims of foreign affiliates) from the BIS consolidated data by nationality. We use both the data-set on an immediate borrower basis and on an ultimate risk basis.¹⁰ This data covers 18 lenders (advanced countries) and 61 recipients. We adjust the data for breaks *in coverage*, and in a separate exercise (aimed at uncovering what happens on the “intensive margin”) for breaks owing to changes in ownership. The BIS data often provide the size of the break for lender-borrower pairs. When the BIS data only provide the aggregate break at the level of the lender, we distribute the break proportionately over recipients, based on exposure of the lender to recipients at the beginning of the period.¹¹ We also adjust the data for exchange rate changes, in particular by assuming that all intra-EZ international lending occurs in Euro. Figure 2 illustrates the data concepts and the data appendix provides details.

We construct a series for domestic lending by domestic banks. Following Cetorelli and Goldberg (2011) we combine data on domestic credit (IFS)¹² with BIS data on local claims of foreign affiliates, to obtain domestic credit excluding domestic credit extended by foreign bank affiliates.¹³ The measure includes bank loans and securities to the private sector and to government and excludes claims on the central bank. Local claims in EZ countries are assumed to be in Euro, hence adjusted for exchange rate changes.

Finally, we use various sources of data for fundamentals, aiming to cover bank soundness, sovereign and country risk, growth and geography. Our first measure of bank soundness is from the Global Competitiveness Report. Specifically, we use poll data from 2006 published in 2009 report, poll data from 2008 published in 2011 report, and poll data from 2010 published in 2012-13. We also use

¹⁰ BIS consolidated data by immediate borrower cover foreign claims, which are the sum of (a) international claims and (b) local claims in local currency. BIS consolidated data on an *ultimate risk* basis provide a different breakdown of foreign claims, namely (a) cross-border claims and (b) local claims of foreign affiliates. See the appendix for a discussion of the differences between immediate borrower and ultimate risk basis.

¹¹ Changes on account of mergers of domestic banks lead to consolidation of intra-bank claims and a reduction of international exposure which is not real, hence we adjust for this type of break in our baseline. Acquisitions/disposals *are* changes in foreign exposure, so are not removed in our baseline regressions. For the few cases where the BIS indicates that there were breaks, but even the data on the total break is not available, we use the quarterly change as the size of the break.

¹² Data was missing for the first half of 2012 for the US, and Federal Reserve figures were used (commercial bank SA credit growth of 4.2 annually). Data was missing for Canada starting 2009, and series from the Bank of Canada were used (table C3 chartered banks Canadian government securities and Table E2 total household and business credit). http://www.bankofcanada.ca/wp-content/uploads/2013/07/bfs_july2013.pdf

¹³ For data on an IB basis, we use local claims in local currency (as do Cetorelli and Goldberg). For data on UR basis, we use local claims in all currencies. We use IFS data lines 22s (22d if 22s is not available) and 22a +22b (claims on central government and state and local governments). Cetorelli and Goldberg (2011) use 22d and 22a+b+c, i.e. private sector and nonfinancial public enterprises, but this provides a smaller sample by dropping some countries such as Austria.

exposure to GIIPS countries (a common lender variable), the indicator of systemic banking crisis of Laeven and Valencia (2013),¹⁴ as well as the share of domestic lending in total lending (an indicator of banks soundness given that international banks are more dependent on wholesale funding and more interconnected making it more difficult to assess their creditworthiness). For sovereign risk, we use the Standard and Poor's foreign currency long-term issuer ratings and for country risk the Institutional Investor country ratings, effective at the beginning of each 6-monthly period under study. For GDP growth we use WEO data. Finally we use various geographic indicators: bilateral distance, common language and contiguity from CEPIL.¹⁵

2. Findings: baseline results

Figure 3 illustrates how our raw data for changes in bilateral foreign and domestic exposures looks for the period June 2008-June 2012. Our baseline results are based on BIS data on a consolidated basis (both immediate borrower and ultimate risk) and adjusted for breaks in coverage only.

2.1 First stage regressions (baseline results)

Our first stage regressions regress changes in exposure on recipient, lender and self-lender effects based on the first stage equation given above. The same equation is also estimated for 6-month periods. The regression results are too voluminous to represent in a single table, and we present selected findings in three separate tables for recipient, lender and self-lender effects (Tables 1-3). To save space, we only present the first stage results on an immediate borrower basis.

Table 1 presents the self-lender effects., Table 2 presents the recipient effects and table 3 the lender effects.

Table 1 shows our main variable of interest, i.e. the self-lender effect (immediate borrower basis). We calculate the average of the self-lender effects over all countries to gauge the extent of deglobalization. The self-lender effect is the change in domestic exposure over and above what would be expected based on the behavior of banks towards other (foreign) borrowers.

Deglobalization appears marked in two periods: the second half of 2008 (increase in domestic exposure 15% more than expected), the full year 2010 (7% increase), and the second half of 2011 (7% increase). These correspond to periods of greatest stress in banking systems, respectively the Lehman collapse, concern about Greek debt, and the peak of the EZ crisis. Of note are the large

¹⁴ A systemic banking crisis occurs if (i) a country's banking system exhibits significant losses resulting in a share of nonperforming loans above 20 percent or bank closures of at least 20 percent of banking system assets) or (ii) fiscal restructuring costs of the banking sector are sufficiently high exceeding 5 percent of GDP.

¹⁵ The distance indicator includes "intra-national" distance, based on city-level population data. <http://www.cepii.fr/anglaisgraph/bdd/distances.htm#sthash.NdSmPOBu.dpuf>

flight home effects in Greece, Ireland and Italy during 2010—with increases in domestic exposure relative to what would be expected on the order of 50%. In the second half of 2011, there are flight home effects on the order of 15% in Denmark, France, Germany and Switzerland. Greece, Ireland, and Spain also experience large flight home effects during this period.

Only for Canada, Japan and the US are self-lender effects substantially negative for the period as a whole. The growth rate of lending at home was 30% less than expected for those countries. These three countries started from low international exposures, and increased them over time.

Table 2 reports the coefficients from the first stage regressions for recipient effects for just the full period and two sub-periods. The results need to be interpreted not in absolute terms, but in relation to the results for the other countries in the table. The omitted category in the regressions is lending from Australia to Argentina. The coefficients can be interpreted as percent change in exposure, and are useful for gaging the relative attractiveness of recipients. E.g., the -0.25 coefficient for the US indicates that the US was a somewhat less attractive investment destination than Germany (with a coefficient of -0.15). The coefficients should not be interpreted in absolute terms.¹⁶

Table 3 presents the lender effects, again on an immediate borrower basis. These lender effects need to be interpreted as lender effects relative to Australia as a lender (the omitted category). For example, for the entire period, US banks tended to increase exposure by 20% more than Australian banks. Lender effects are highly statistically significant especially in the first year of the period considered (June 2008-June 2009) and again for a subset of countries at the height of the EZ crisis (France, Germany, Switzerland have statistically significant negative lender effects, as do Greece, Spain and Ireland).

2.2 Second stage regressions (baseline results)

In the next stage, as explained in the methodology section, we regress the coefficients from the first stage regression on a set of fundamentals. We do this for two periods: the second half of 2008 and the second half of 2011. For recipient effects, it is possible to include several fundamentals at the same time, because the large number of coefficients ensures that there are sufficient degrees of freedom to do this. For lender and self-lender, on the other hand, the number of coefficients is less than 20, and we only test the role of one fundamental at a time. We present the results of the regressions both on an immediate borrower and on an ultimate risk basis.

For recipient effects, we find that growth rates of recipients have a statistically and economically significant effect on recipient coefficients when using data an ultimate risk basis (though not on an

¹⁶This is because exposure is also entered separately in addition to as an interaction of recipient dummy and exposure. Therefore, the overall percent change in exposure is the sum of the coefficient on the interaction term of recipient dummy and exposure and the coefficient on un-interacted exposure. For example, for the entire period, Australian (the omitted category) banks tended to increase their exposures to the US by 12% (-0.25 coefficient on interaction term of US as a recipient and exposure +0.37 coefficient on uninteracted exposure) and to Germany by 22% (-0.15+0.37).

immediate borrower basis), for the period 2011H2. Thus it seems that growth in the country where the ultimate risk lies, but not growth in the country of the immediate borrower, plays a role: a one percentage point higher growth rate leads to a one percentage point higher change in exposure to the recipient. Sovereign and country ratings (S&P and Institutional Investor respectively) are not statistically significant.¹⁷

Lender effects are significantly and negatively associated with several of the indicators of bank soundness which we considered. Table 5 shows these results based on data on an immediate borrower (IB) basis, and notes (using the indicator “R”) indicate whether the results hold on an ultimate risk (UR) basis. At the start of the global financial crisis (2008h2), the share of domestic exposure in total exposure of a country plays an important role (both on an IB and UR basis). Countries with high domestic exposure were willing to increase (or maintain) their exposure internationally, relative to others, and this explains about half of the variance in the lender effects. This is in line with the generally accepted view that it was global banks (concentrated in certain European countries) which retreated the most given their funding difficulties. Exposure to GIIPS countries is significant at the 10% level of significance (IB and UR). Our measure for bank soundness, the change in bank soundness and the indicator for a systemic banking crisis are not statistically significant for this first period.

In the second period we consider, the EZ crisis (2011h2), three indicators of bank soundness (bank soundness, change in bank soundness, exposure to GIIPS countries) are statistically significant on an IB and UR basis, and in addition the systemic crisis indicator is significant on an IB basis. The strong role for bank soundness is in line with earlier findings in the literature described above.¹⁸ The share of domestic exposure to total exposure is not significant for this period. Table 5 presents these results (left panel).

Table 5 (right panel) also shows the impact of these variables on the self-lender-effects. The change in bank soundness (IB basis) is insignificant at the start of the global financial crisis and significant in the EZ-crisis. Other indicators of bank soundness are however not significant. Our findings confirm the finding in the literature (Giannetti and Laeven) that deteriorating bank soundness contributed to the flight home. It is of interest to note, however, that there are countries—notably Germany and Switzerland—where bank soundness was improving, yet there was also flight home, as the scatter diagram relating the flight home coefficient to the change in bank soundness shows (Figure 4).

We investigated whether stress on the sovereign might explain the flight home (Table 6). More specifically, was the flight home accompanied by a flight to government bonds? High sovereign

¹⁷ Table 5 shows the results for the Institutional Investor Rating in place at the time (the previous September’s value). We obtain similar results for the S&P sovereign foreign currency rating. We use contemporaneous growth rate, which could itself be a reflection of the amount of lending to recipients. Ideally, we would use forecasts for the growth rate.

¹⁸ In these regressions we have 17 coefficients for the lender effect and 18 for the self-lender effect, except for the regressions with exposure to GIIPS countries, where the GIIPS countries are not included (leaving just 12 and 13 observations). On an UR basis, the indicator of systemic risk is not statistically significant, so only three of the indicators are statistically significant (bank soundness, change in bank soundness, and exposure to GIIPS countries).

spreads or moral suasion might have attracted banks to lend more to the government, funded by a reduction in foreign exposure. Spain and Italy come to mind. We investigate this for the second half of 2011, given that sovereign stresses had accumulated over the preceding years. It turns out that increases in government bond holdings by domestic banks in themselves are not correlated with the lender and self-lender effects, but the interaction of systemic bank crisis and the change in government bond holdings by domestic banks is, based on IB and UR data (Table 6). This suggests that banks repatriate assets, channeling them to the sovereign, in already fragile situations (banking crisis). This further accentuates bank-sovereign interdependence and the “doom loop”, whereby sovereign balance sheets affect the balance sheets of banks, in turn increasing contingent liabilities for the sovereign.

Finally, we checked the link between sovereign and country ratings and lender and self-lender effects. The expected sign was a priori unclear. While high ratings might predispose banks to lending at home, stress on the sovereign (reflected in low ratings) could also lead banks to repatriate funds. We find that the coefficients on sovereign and country ratings are not statistically significant for the self-lender effect (Table 6).

2.3 Findings: further results

We carry out two types of additional regressions: (1) adding bilateral variables; and (2) taking into account breaks in the data associated with changes in ownership of banks, thereby focusing on international lending at the “intensive margin”.

Adding bilateral variables

Our baseline regression does not include bilateral variables, which have received attention in the literature. We checked whether adding those would make any difference to our results in the first and second stage of our regressions.

Specifically, we include bilateral distance (logged), common language, contiguity and relative credit ratings (Institutional Investor) in the first stage regressions. We find that the role of geography varies depending on the period (Table 7). For the period as a whole, and for the peak of the crisis in 2008H2, the impact of distance is negative—i.e. flows to distant countries were lower. Having a contiguous land mass is associated with larger flows for the period as a whole and for the EZ crisis (second half of 2011). Having a common language and higher ratings in recipients relative to lenders are not usually related to inflows at statistically significant levels, contrary to what one might have expected. We also checked whether the results for the second stage regressions of recipient, lender and self-lender coefficients were affected by adding the bilateral variables in the first stage, and found that they were not (results not reported).

Removing the impact of ownership changes

We next turn to the effect of sales and acquisitions of banks. One interesting question is to what extent these account for the strong self-lender effect we have found. If sales and acquisitions have a home bias—i.e. if international bank branches and subsidiaries are sold to the country they are located in, the self-lender effect will be smaller after removing the impact of sales and acquisitions from the data.¹⁹ Turned on its head, the question is to what extent the self-lender effects persist on the intensive margin, i.e. through changes in exposure of banks themselves, rather than through changes in international ownership of banks.

Table 8 presents the results of removing the effect of bank sales and acquisitions from bank flows, both for data on an IB basis and UR basis. In effect, we carried out the exercise by not only adjusting the data for breaks for coverage (break1) but also adjusting the data for breaks resulting from sales and acquisitions of banks. The BIS database provides information on breaks in data reflecting such sales and acquisitions (see data Appendix) on the basis of which we create a second variable for flows.

We find that excluding sales and acquisitions from flows leads to a reduction of the self-lender coefficients of almost 20% on average under both IB and UR. In other words, the flight home effect, while reduced, persists at the intensive margin. The impact of sales and acquisitions is strongest for the Netherlands, and is also important for Austria, Ireland, Portugal and Switzerland. Since sales and acquisitions themselves were part of the crisis and the financial protectionism dynamics (e.g. the Dutch government preferred to retain the Dutch part of Fortis), one could interpret the increase in self-lender coefficients which resulted as being the result of crisis and financial protectionism as well.²⁰

The second stage regression results at the intensive margin are very similar to those at the extensive margin (results not reported). In the early stage of the global financial crisis (2008H2), domestic exposure continues to be statistically significant at the intensive margin for the lender effect, though its size is reduced by half (IB and UR data). In the EZ crisis (2011H2), the role of bank soundness persists, and so does the role of sovereign stress (IB and UR data). However, systemic crisis and exposure to GIIPS lose their significance in the EZ crisis for the lender effect (IB data only; there is no change with UR data).

¹⁹ Technically, this is because sales of an international subsidiary to a home bank reduces local claims of international banks in that country, and thereby increases domestic credit extended by domestic banks. Adjusting the data for such sales then reverses this effect.

²⁰ For Spain, the home bias is increased. This is because Spain made foreign acquisitions. At the intensive margin, the home bias was even greater.

3. Conclusion

The twin purposes of this paper are to gauge the extent of financial deglobalization and to explore potential explanations. Our results show that the financial world has indeed become smaller.

Almost all banking systems are less active internationally. The flight home effect was positive for most lenders with three interesting exceptions being Canada, Japan, and the US. The flight home effect was strongest in periods of greatest banking system turmoil: the second half of 2008 (affected by the collapse of Lehman and money market funds investing in commercial paper), the year 2010—the period of greatest concern about the Greek crisis, and during the second half of 2011, during the EZ crisis. In periods of calm, reversals of the flight home are small. As a result, we experience cumulative deglobalization.

As to the explanations of the flight home: *Bank soundness* explains some of the variance in the flight home effect. Countries that have experienced more damaging banking crises tend to discriminate against international lending. Financial protectionism could be an underlying explanation for this behavior, as we can expect it to be strongest in countries with more damaging crises.

Sovereign stress paired with banking stress also helps explain the flight home effect. This is as one would expect based on the “flight to sovereign debt” experienced in countries such as Spain. *Sales and acquisitions of banks* contributed to the flight home; however, the flight home effect was strong at the intensive margin as well.

What does this mean in terms of welfare? On the one hand, the flight home effect is of concern as it may have negative consequences on the global allocation of capital. Access to capital for some countries might become more difficult and expensive. Furthermore, the stabilizing influence of international banks at times of local shocks will be lost. On the other hand, the evidence of the benefits of international capital flows is still elusive and the costs of sudden flow reversals are rather tangible.²¹ Therefore, there is an increasing acceptance in the policy community of macro-prudential measures and capital controls aimed at insulating countries from the global financial cycle. Most of these new instruments have not been widely tested, though. It is probably fair to say that the jury on whether a smaller world of banking will be a more stable world is still out.

²¹ See Rey (2013)

4. Data Appendix

Description of the data and breaks in data

While the BIS maintains both a locational and consolidated database, bilateral data by lender and recipient (as opposed to aggregates by lender and aggregates by recipient) is only publicly available for the consolidated data. This data consolidates claims of banks across countries and attributes the claims of the consolidated entity to the country where the group-level supervisor is located (the supervisor of the controlling parent). Figure 2 illustrates the difference between locational and consolidated data. Branches and subsidiaries are treated identically since control and supervision of the controlling parent is abroad in both cases.

When a bank's behavior depends on the nationality of the bank and on its consolidated exposure, consolidated claims are a good measure. First, consolidation is useful because it avoids double-counting (in the locational data claims between the head office and foreign associates are counted twice, once as the claim of the head office on the foreign associate and once as the claim of the foreign associate on whoever it lends the funds). Second, it allows one to track the exposure to individual countries at the bank's group level, which is what one would expect a bank's management to respond to.²²

The BIS consolidated data are available on an immediate borrower and ultimate risk basis. In the latter case, data takes into account risk transfers between the immediate borrower country and the country where the ultimate risk lies. Risk transfers occur both when there are guarantees and when the borrower is legally dependent on a head office outside the country (as in the case of a bank branch, not in the case of a subsidiary).²³ "Claims which have been guaranteed by residents of other countries are subtracted (outward risk reallocation) and guarantees provided by residents of the specified country for reporting banks' claims outstanding elsewhere are added (inward risk reallocation)."²⁴ Data on ultimate risk is more desirable than data on an immediate borrower basis because this data better captures the nationality of exposures. To illustrate the point, a loan to a US *branch* of a Japanese bank is counted as exposure to the US on an immediate borrower basis, but as exposure to Japan on an ultimate risk basis.²⁵ A downside for the data on ultimate risk is that they cover one reporting country less (Denmark) than data on an immediate borrower basis, resulting in about 6% fewer total observations.

²² On the other hand, bank regulators of a different nationality than the owners may influence bank behavior, in particular in the case of subsidiaries (as opposed to branches), where supervision is the responsibility of the host country rather than the home country.

²³ http://www.bis.org/statistics/bankstatsguide_glossary.pdf.

²⁴ If A lends to B but this is guaranteed by C, we register a claim from A on C. There is an outward risk transfer out of B and an inward risk transfer into C. An example is collateralized borrowing, if securities issued in country C are used as collateral for the borrowing by B.

²⁵ <http://www.bis.org/press/p001103.htm>.

A final point, already mentioned in a footnote earlier, is that BIS consolidated data by immediate borrower is broken down into (a) international claims and (b) local claims in local currency. International claims include local claims in foreign currency. BIS consolidated data on an *ultimate risk* basis provide a different breakdown of foreign claims, namely (a) cross-border claims and (b) local claims of foreign affiliates.

Two other sources of concern with the BIS data are (1) breaks in the data and (2) the fact that changes in exposure do not correspond to actual flows because of valuation changes (notably those resulting from changes in exchange rates).

The BIS website indicates that there are important breaks in the BIS data owing to changes in coverage, acquisitions, and restructurings. Breaks in the data are there both for international claims and local claims in local currency. We distinguish between breaks related to coverage (break 1) and breaks related to sales and acquisitions (break 2).

Appendix Table 1 below lists breaks for international claims when they exceed 1% of exposures (fourth column). Most notable amongst these is the inclusion of former US investment banks, which added about a trillion (8% of initial domestic and foreign exposure) to US bank exposures in the first quarter of 2009. Ireland (second half of 2008), the UK (first half of 2009) and France (first half of 2012) also had breaks related to coverage as indicated in the BIS notes.²⁶ We adjust the data in our *baseline* regressions for these breaks related to *coverage* (“break1”). When data is available in the BIS website on how these breaks affected bilateral data, we make precise adjustments to the data. When data is not available, we proportionately distribute the break over borrowers (see the last column on Appendix Table 1). We also adjust the data on lending by Australia to New Zealand in 2008h2, to take into account of the fact that Australia changed its reporting of lending to New Zealand in the third quarter of 2008 (previously this lending was recorded under “residual developed countries”).

For local claims in local currency (claims made by foreign affiliates in the host country in local currency, LCLC), used as part of the calculation of domestic credit, there are also breaks, as shown in Appendix Table 2, but it is not immediately clear whether these are related to coverage or acquisitions so we need to make guesses. In 2008h2 and 2011h2, which are the focus of our analysis, there are no breaks related to coverage, so all the changes in Appendix Table 2 represent changes in ownership (break2). For 2009h1, Appendix Table 1 indicates that there were only two important reasons for breaks in local claims data: the US coverage of investment banks and an acquisition of a foreign bank by Spain (this appears to be the acquisition of the US Guaranty Bank by BBVA). We attribute the US\$69.1 bn increase in LCLC in Table 2 in the US to the Spanish acquisition (which Table 1 also tells us led to a US\$69.1 bn increase in LCLC). We attribute all other changes in Table 2 to changes in coverage (break1). For 2009h2, there are two sources of coverage breaks: the move in

²⁶ The size of the break was only given for France for individual borrowers; for the US, UK and Ireland only the total break was given. For France, the \$80 billion increase in exposure on account of improved reporting stemmed from increased exposure to Belgium, Germany, the UK and the Netherlands (about 30 each) and reduced exposure to the US (\$40bn).

headquarter from Switzerland to Luxemburg of a Greek bank (Eurobank EFG) and the merger among French banks. Re. the former, we assume that the full break in LCLC in Greece results from this. For the French banks, the break of \$30.8bn could be distributed proportionately on its partners, but is only 0.4% of LCLC of partners, and a much smaller share of domestic credit, so that we can safely ignore it. For 2010h1 and 2010h2, there are no large LCLC breaks, they are mostly break1, and all are treated as break1. For 2011h1, all breaks are break1. For 2012h1, it is impossible to separate the impact of break1 and break2. Break 1 is of larger magnitude and all breaks are relatively small, so all are treated as break1.

Appendix Table 1. Breaks in consolidated data on immediate borrower basis, as reported by the BIS

Period	Country	Explanation of break	Impact on international claims in bn USD (CB+LCFC)	Adjustments
2012-Q1	France	Improved data quality through changes in reporting sources Local currency claims on local residents -148.1 Local currency liabilities to local residents +79.5	+227.6	Break1
	Netherlands	Sale of a foreign bank Local currency claims on local residents: -82.32 Local currency liabilities to local residents: -95.74	-1.23	Break2
2011-Q4	Ireland	Reclassification of reporting institutions from domestically owned banks to inside area consolidated and unconsolidated offices Local currency claims on local residents: -4.58 Local currency liabilities to local residents: -2.12 Net risk transfers: 2.53	+14.77	Not identified as break in BIS data, no adjustment
	Austria	Reclassification of reporting institutions from domestically owned banks to inside area unconsolidated offices; started reporting local currency liabilities to local residents	...	Break1** No data, use quarterly Change (-48)
2011-Q2	Spain	Incorporation of data from a credit institution acquisition Local currency claims of foreign offices: 15.4 Local currency liabilities of foreign offices: 13.9	+1.1	Break1 No data, use quarterly Change (PL:+15)
2011-Q1	France	Reclassification of accrual accounts Local currency claims of foreign offices: -59.40 Local currency liabilities of foreign offices: -85.76	-9.98	Break1 Proportional
	Spain	Increase in domestic banks reporting population Local currency claims of foreign offices: 15.1 Local currency liabilities of foreign offices: 17.0 Net risk transfers: 0.0	+6.9	Break1 No data, use quarterly Change (TK:+22)
2010-Q4	Ireland	Restructuring of a large international banking group and the closure of domestic offices by a foreign bank ²⁷ Local currency claims of foreign offices: -22.0 Local currency liabilities of foreign offices: -21.6 Net risk transfers: 4.2	-164.3	Break2 Proportional
	UK	Restructuring within the population of reporting banks	...	Break2 No data, assume quarterly change (IE:-27) (only counterparty Ireland: -26)
	France	Reclassification of reporting institutions ²⁸ Local currency claims of foreign offices: -211.6	-32.6	Break1** Proportional

²⁷ Reduction in international exposure through phasing out corporate lending to the UK. In Ireland, reduced exposure through the sale of Bank of Ireland's mortgage brokerage business and stake in Irish Credit Bureau.

²⁸ The BIS Quarterly Review (June 2011) notes that in the fourth quarter of 2010, "A French bank controlled by a foreign non-bank financial company, whose accounts are prudentially supervised by the competent foreign authority, was reclassified from a consolidated domestic bank to an unconsolidated foreign bank in the French data."

		Local currency liabilities of foreign offices: -62.9 Net risk transfers: -7.6		
	Germany	Transfer of positions from "Deutsche Pfandbriefbank" to the Bad Bank "FMS Wertmanagement" (a non bank) and change of ownership of a bank and other reasons ²⁹ Net risk transfers: -1.9	-11.1	Break1**
2010-Q2	Ireland	Change in reporting population	+13.6	Break1
	Netherlands	Change in population of domestic banks Local currency claims of foreign offices: ... Local currency liabilities of foreign offices:	Break1** No data, assume Quarterly change (-322)
	Germany	Acquisition of foreign offices by domestic banks Local currency claims of foreign offices: 11.4 Local currency liabilities of foreign offices: 8.7	0	Break2
2009-Q4	Belgium	Sale of a domestic bank Local currency claims of foreign offices: -82.7 Local currency liabilities of foreign offices: -98.9	-241.6	Break2
	France	Acquisition of a foreign bank Local currency claims of foreign offices: 234.2 Local currency liabilities of foreign offices: 138.0	+229.2	Break2
	Greece	Reclassification of inside area foreign bank as domestic bank Local currency claims of foreign offices: 18.5 Local currency liabilities of foreign offices: 10.0	+37.6	Break1** Proportional Affects LCLC coverage
	Switzerland	Reclassification of foreign unit of a domestic bank. Acquisition of domestic unit of foreign bank. Local currency claims of foreign offices: -75.5 Local currency liabilities of foreign offices: -78.4	-76.2	Break1**
2009-Q3	France	Merger of domestic banks Local currency claims of foreign offices: -30.8 Local currency liabilities of foreign offices: -42.2	-202.2	Break1
2009-Q1	Spain	Acquisition of foreign bank by domestic bank Local currency claims of foreign offices: 69.1 Local currency liabilities of foreign offices: 69.0	0.3	Break2
	UK	Increase in reporting population due to inclusion of building societies Local currency claims of foreign offices: 1.4 Local currency liabilities of foreign offices: 4.3	33.2	Break1 Proportional
	US	Increase in reporting population, including of the former Investment Banks Local currency claims of foreign offices: 220.6 Local currency liabilities of foreign offices: 184.9	733.9	Break1 Proportional
2008-Q4	Belgium	Sale of a foreign bank Local currency claims of foreign offices: -234.5 Local currency liabilities of foreign offices: -347.0	-133.9	Break2
	Netherlands	Acquisition of a foreign bank Local currency claims of foreign offices: 1.9 Local currency liabilities of foreign offices: -	29.4	Break2
	Spain	Acquisition of a foreign bank. Change in nationality of banks among domestic, inside area and outside area foreign banks. Begins reporting International Claims with maturity breakdown, previously estimated.	22.8	Break2

²⁹ The BIS Quarterly Review of June 2011 notes that the breaks for Germany in the fourth quarter of 2010 stemmed from transfers of exposures to asset management companies, which do not report to the BIS.

		Local currency claims of foreign offices: 80.4 Local currency liabilities of foreign offices: 75.9		
2008-Q3	Netherlands	Sale of a foreign bank Local currency claims of foreign offices: -45.5 Local currency liabilities of foreign offices: -45.5	0	Break2
	Spain	Acquisition of a foreign bank Local currency claims of foreign offices: 50.0 Local currency liabilities of foreign offices: 41.0	0	Break2
	Ireland	Four institutions change from reporting as Outside Area Foreign Office to Inside Area Foreign Office	-40.1	Not in data

Source: <http://www.bis.org/statistics/breakstablecons.pdf>

**We compared our classification with that of Cerutti (2013)'s careful analysis. Two stars indicates instances where we classify breaks as coverage breaks, but Cerutti does not.

Appendix Table 2: Breaks in local claims in local currency, all banks
(million USD)

Counterparty	2008H2	2009H1	2009H2	2010H1	2010H2	2011H1	2011H2	2012H1
AU: Australia	550	5545	-25	-8361	-1011	-672	0	-855
AT: Austria	-15	67	-11555	-82	-2912	-14	0	-1758
BE: Belgium	18	33	169265	-661	-41929	-12790	0	13084
BR: Brazil	4486	915	-1	0	-459	-586	0	791
CA: Canada	141	19478	2326	-736	-3871	-4	0	912
CL: Chile	0	23	0	-517	-641	0	0	-1
TW: Taiwan	-97	826	-34	0	-324	-80	0	-155
DK: Denmark	-60	16	395	-887	-172	-14	0	-936
FR: France	382	1876	-15635	-1160	-219	0	0	0
DE: Germany	-830	26796	-3915	-1566	-34704	-1559	0	-7514
GR: Greece	-68	110	-40732	-602	-1298	-58	0	-229
IE: Ireland	-4925	-2139	-43	-547	36676	-107	0	-4768
IT: Italy	-1620	3283	-2420	-2633	-42527	-16141	0	25137
JP: Japan	85	55607	-269	0	-12630	-2534	0	-25401
MX: Mexico	1	2308	0	-332	-2302	0	0	1158
NL: Netherlands	-174846	3392	673	11864	362	-1096	0	-11084
PA: Panama	0	13	-2	0	-7	0	0	-39
PT: Portugal	-37	35	351	0	-3574	-515	0	-758
ES: Spain	-4522	4782	-253	-800	-24488	-3083	0	-5585
SE: Sweden	-52	314	-188	-214	-52	-41	0	-1519
CH: Switzerland	-437	1217	-367	0	-5460	2832	0	2395
TR: Turkey	-730	82	1115	-622	627	13659	0	1315
GB: United Kingdom	73337	81942	6012	-4328	-23144	-1656	0	-12192
US: United States	-34437	69129	-41569	-1599	-26183	-12064	0	-84716

Breaks are calculated as the difference between (reported) post-break and pre-break value. In the instances in which the BIS does not report pre-break data, breaks are calculated as the change from the previous quarter. These breaks are used when studying lending at the intrinsic margin ("break 2"). A subset of the breaks ("break 1") is used in the baseline, as described in the data appendix.

Adjustment for exchange rate changes

Exposures are not always in USD, so flows (estimated as the change in stocks) might reflect exchange rate changes rather than true flows, and hence be subject to bias. The table below shows that the USD accounts for 14 out of 31 trillion USD in claims in June 2012, so for about half of exposures there is no issue.

The Euro dominates in claims in domestic currency to non-residents, with lending of 7 out of 12 trillion USD. This reflects the fact that Euro area banks frequently lend in their own currency and lend more than US banks. We don't know who the recipients are and need to make an assumption: We assume that Eurozone country lending to Eurozone recipients was in Euro. Claims by Eurozone lenders to Eurozone recipients amounted to about 4 trillion USD in June 2012. We adjust these amounts for exchange rate changes by expressing exposures at all times in 2008 June USD (dividing reported USD exposures by the new Euro-USD exchange rate and multiplying by the 2008 June USD exchange rate), and recalculating flows as the change in these adjusted exposures. With this adjustment, exchange rate valuation remains an issue for about 13 out of 31 trillion.

Appendix Table 3: Currency composition of lending

2012 June, Trillion USD	Total	USD	Euro	Yen	Pound S.	Swiss franc	Residual currencies
Claims in domestic currency, to non-residents	11.6	2.8	6.9	0.8	0.6	0.1	0.5
Claims in foreign currency, to residents	3.3	1.8	0.2	0.1	0.2	0.1	0.8
Claims in foreign currency, to non-residents	15.8	9.1	1.7	0.7	0.4	0.5	3.4
Total	30.8	13.7	8.8	1.7	1.2	0.7	4.7
<i>For comparison: Foreign claims by bank nationality</i>							
US banks	3.2						
Eurozone banks	9.2						
o/w claims on other Eurozone countries	3.8						
Japanese banks	3.1						
UK banks	4.1						
Swiss banks	1.8						
Other banks	4.1						
Total	29.3						

Sources: Top panel: BIS, International bank position by residence (locational statistics). Bottom panel: BIS consolidated statistics.

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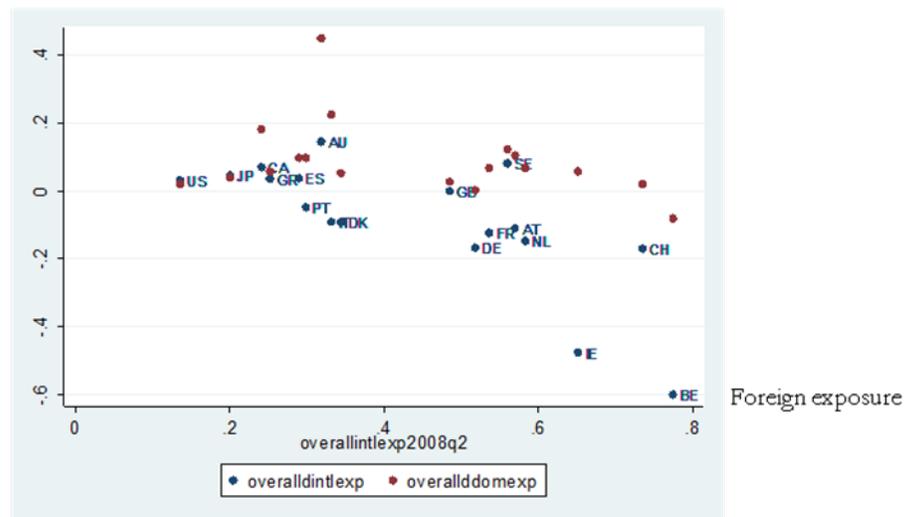
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Figure 1. Changes in international and domestic exposures
Aggregated by lender

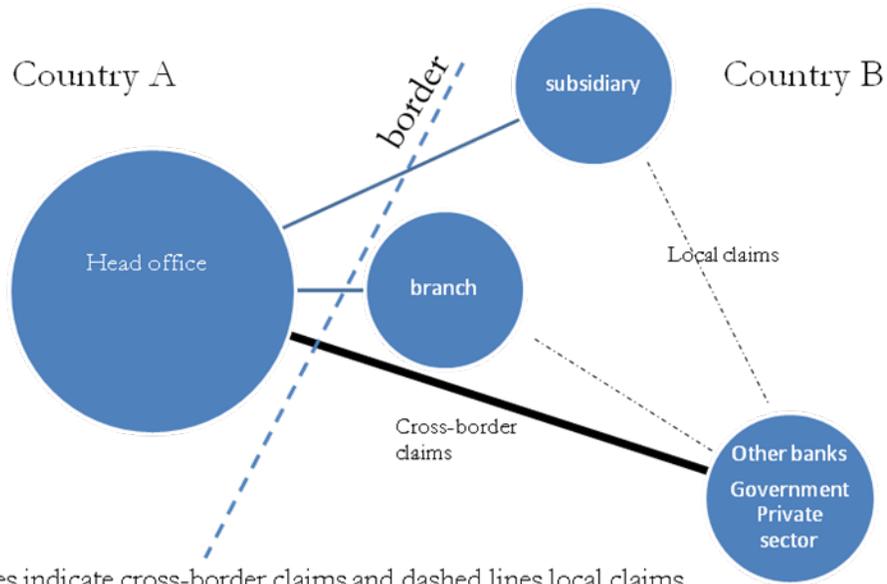
Changes in exposure
 (Jun 2008-Jun 2012)



The chart shows changes in domestic and foreign exposure on the vertical axis and initial foreign exposure on the horizontal axis and shows that most countries are reducing foreign exposure and increasing domestic exposure. Variables are scaled by total exposure to international and domestic recipients. Labeled points refer to foreign exposure and the red points to domestic exposure. Intra-EZ flows adjusted for exchange rate changes vis a vis USD. Changes in foreign and domestic exposure corrected for breaks in the data reflecting changes in coverage (see data appendix).

Figure 2. Consolidated vs Locational Statistics

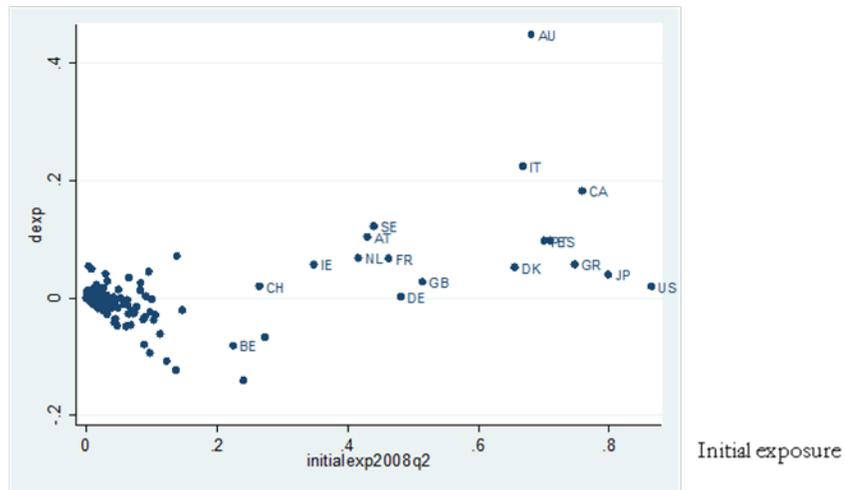
Claims by head office in country A on affiliates in country B are included in claims in locational statistics of country A, but not consolidated statistics.



Solid lines indicate cross-border claims and dashed lines local claims. Consolidated claims are cross-border claims excluding positions between related offices (the heavy solid line) and local claims. Local claims consist of local currency and foreign currency claims. In the statistics on an immediate borrower basis, international claims are defined as cross-border claims plus local claims in foreign currency. Graphic represents relationships on an immediate borrower basis. Ultimate risk may be different.

Figure 3. Changes in international and domestic exposure
Lender-recipient pairs

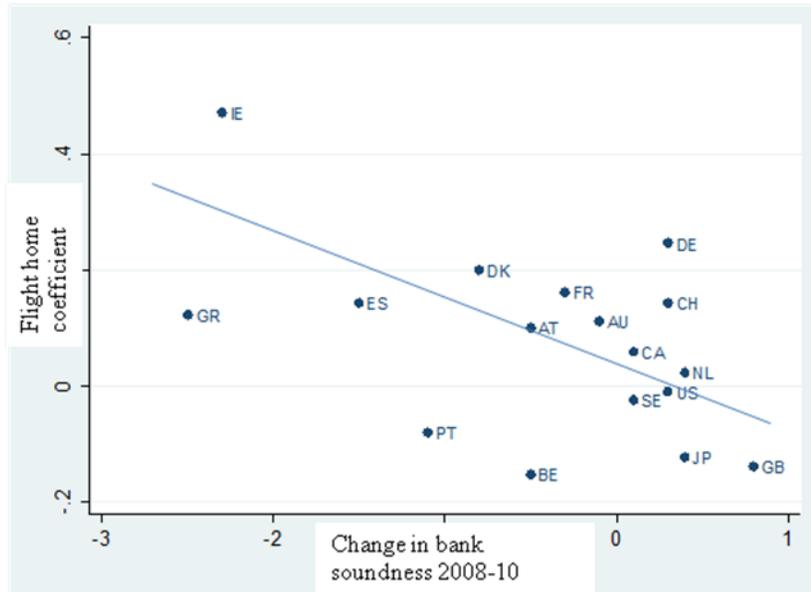
Changes in exposure
(Jun 2008-Jun 2012)



The chart illustrates the data used in the regressions. Labeled points indicate domestic lending; unlabeled points refer to foreign lending (one observation for each lender-recipient pair). Data is scaled by total domestic plus foreign exposure. Intra-EZ flows adjusted for exchange rate changes vis a vis USD. Data corrected for breaks reflecting changes in coverage (see data appendix).

Figure 4. Flight home coefficients and change in bank soundness, EZ crisis (2011h2)

Home effect=0.04-0.08x Change bank soundness (P=0.04)



The flight home coefficients are statistically significantly associated with the change in bank soundness indicators, consistent with earlier research linking banking crises with the flight home effect. Countries under banking stress turn home to a greater extent. Germany (DE) and Switzerland (CH) are outliers, with improved bank soundness and flight home.

Table 1. First Stage Regression Results: coefficients on “self-lending” (γ_j) (flight home effects)

Immediate Borrower basis and adjusted for coverage breaks

The estimating equation is $\Delta E_{ij} = \alpha_i i.recipient \times E_{ij} + \beta_j i.lender \times E_{ij} + \gamma_j i.self \times E_{ij}$

where: E_{ij} --exposure of country i banks to country j assets, as a percent of total international and domestic exposure of country i banks
i.recipient recipient effects, *i.lender* lender effects, *i.self* self-lender (flight home) effects

	2008h2-2012h1	2008h2	2009h1	2009h2	2010h1	2010h2	2011h1	2011h2	2012h1
AU:Australia	0.56**	0.47***	-0.30***	0.07***	0.17***	-0.21***	-0.03	0.12*	0.06
AT:Austria	0.41***	-0.08	0.07***	0.03	-0.10***	0.23***	-0.02	0.12	0.06
BE:Belgium	0.21*	0.13	0.09*	0.23***	0.07*	0.29***	0.12*	-0.15	-0.1
CA:Canada	-0.34*	0.09	0	-0.25***	-0.04	-0.08	0.01	0.03	-0.07
DK:Denmark	-0.04	0.41***	-0.19***	-0.06	0.11	-0.24**	-0.15*	0.20**	-0.11***
FR:France	0.36***	0.03	0.09*	0.07**	0.02	-0.03	-0.08***	0.16***	0.13**
DE:Germany	0.30**	0.11***	0.02	0.08***	-0.05	-0.02	0.03	0.25*	-0.1
GR:Greece	0.31	0	-0.16**	-0.12	0.26**	0.34***	0.07	0.12**	-0.11
IE:Ireland	0.92***	0.10***	0.02	-0.14	0.23***	0.37***	0.06	0.46***	0.42***
IT:Italy	0.84***	0.17***	0.14***	0.06*	0.07**	0.35**	0.01	-0.03	0.21***
JP:Japan	-0.27**	0.01	-0.06***	0.1	-0.04	-0.12	0.16***	-0.12***	-0.12**
NL:Netherlands	0.57***	0.62***	0.10**	0.09*	-0.18***	0.03	-0.04	0.03	0.07
PT:Portugal	0.49***	0.07	0.02	0.08*	-0.04	0.05	0.18***	-0.08*	0.08
ES:Spain	-0.02	-0.14**	-0.05	-0.04	0.12***	0	0.04	0.14***	-0.03
SE:Sweden	0.15	0.15***	0.12***	-0.04	0.11	-0.11	-0.16*	-0.03	-0.02
CH:Switzerland	0.15*	0.19***	0.09**	0.1	0	-0.19***	-0.05	0.15**	-0.11
GB:United Kingdom	0.18**	0.36***	-0.13***	0.08***	0.01	-0.03	-0.10***	-0.14**	-0.07*
US:United States	-0.30***	0.07*	0	-0.07**	-0.10***	0.11*	-0.27***	0.06	0.02
R2	0.97	0.97	0.89	0.93	0.98	0.77	0.88	0.83	0.93
Average home effect	0.25	0.15	-0.01	0.02	0.03	0.04	-0.01	0.07	0.01

legend: *10%; **5%; ***1% significance level

Flight home effects indicate the additional growth rate in domestic assets relative to that in foreign assets. E.g. in the US, the growth rate of domestic assets was 30% lower than that of foreign assets, for the period as a whole. The R2 indicates the R2 for the regression as a whole, including recipient and lender effects.

Table 2. First Stage Regression Results: Recipient Effects (α_i)

Immediate Borrower basis and adjusted for coverage breaks

The estimating equation is $\Delta E_{ij} = \alpha_i \cdot i.recipient \times E_{ij} + \beta_j \cdot i.lender \times E_{ij} + \gamma_j \cdot i.self \times E_{ij}$

where: E_{ij} —exposure of country i banks to country j assets, as a percent of total international and domestic exposure of country i banks

$i.recipient$ recipient effects, $i.lender$ lender effects, $i.self$ self-lender (home bias) effects

	2008h2			2008h2			2008h2				
	-2012h1	2008h2	2011h2	-2012h1	2008h2	2011h2	-2012h1	2008h2	2011h2		
Recipient effects*											
AU:Australia	-0.28	-0.14	-0.26***	IS:Iceland	-0.75***	-0.25***	-0.37***	PT:Portugal	-0.36***	0.06	-0.10***
AT:Austria	-0.08	0.33***	-0.24**	IN:India	0.09	0.08	-0.23***	RO:Romania	-0.11	0.23***	-0.15**
BE:Belgium	0.05	0.24**	-0.05	ID:Indonesia	0.25	0.04	-0.1	RU:Russia	-0.16	0.15***	-0.20**
BR:Brazil	-0.13	-0.2	-0.19***	IE:Ireland	-0.32***	0.03	-0.32***	SG:Singapore	0.36	-0.04	-0.14*
BG:Bulgaria	-0.29	0.02	-0.22***	IL:Israel	-0.19	-0.03	-0.34***	SK:Slovakia	0.23**	0.50***	-0.12
CA:Canada	-0.16	0.05	-0.22***	IT:Italy	-0.36***	0.07*	-0.23***	SI:Slovenia	0.50***	0.26***	-0.20**
CL:Chile	-0.04	-0.10***	-0.11***	JP:Japan	-0.35***	0.02	-0.09*	ZA:South Africa	-0.04	-0.05	-0.35***
CN:China	0.61*	-0.13*	-0.20***	JO:Jordan	0.2	-0.35***	-0.08	KR:South Korea	-0.30***	-0.10***	-0.29***
CO:Colombia	-0.14***	-0.07***	-0.02	KE:Kenya	0.27	0.09*	-0.04	ES:Spain	-0.26***	0.18***	-0.21***
CY:Cyprus	0.69***	0.16**	-0.06	LU:Luxembourg	0.16	0.26***	-0.17*	LK:Sri lanka	-0.1	0.14	-0.30***
CZ:Czech Republic	0.09	0.07*	-0.29***	MY:Malaysia	-0.09	-0.17	-0.23***	SE:Sweden	-0.1	0.13***	-0.21***
DK:Denmark	0.22	-0.03	-0.28**	MX:Mexico	-0.50***	-0.22***	-0.18***	CH:Switzerland	-0.06	0.03	-0.28***
EC:Ecuador	-0.48***	0.05	-0.05	MA:Morocco	0.32***	0.06*	-0.11**	TH:Thailand	0.32*	0.05	-0.28***
EG:Egypt	0.06	0.08	-0.27**	NL:Netherlands	-0.26***	-0.21***	-0.17***	TR:Turkey	0.08	-0.07	-0.17***
FI:Finland	0.04	0.16***	-0.06	NZ:New Zealand	6.12***	-0.96***	-0.25***	UA:Ukraine	-0.32***	0.07*	-0.14
FR:France	-0.17*	0.07	-0.24***	NG:Nigeria	-0.49***	-0.20***	-0.30***	AE:United Arab Emirates	-0.21	-0.02	-0.22***
DE:Germany	-0.15	0.15***	-0.34**	NO:Norway	-0.24	0.02	-0.35***	GB:United Kingdom	-0.23***	-0.09***	-0.12***
GR:Greece	-0.13	0.08**	-0.23***	PK:Pakistan	0.04	0.14	-0.14	US:United States	-0.25**	0.06**	-0.15***
HK:Hong Kong SAR	0.49***	0.14***	-0.24***	PE:Peru	0.50***	0.11***	0.02	UY:Uruguay	0.22	-0.03	0.06***
HU:Hungary	-0.19*	0.20***	-0.39***	PH:Philippines	-0.07	-0.13	-0.26***	VE:Venezuela	-0.46***	0.17***	0.09
				PL:Poland	0.13	0.11**	-0.26***	Initial exposure (uninteracted)	0.37**	-0.12***	0.20***

Legend: *10%; **5%; ***1% significance level

*Recipient effects correspond to the coefficient on a dummy variable for the recipient interacted with initial exposure of lender to the recipient. Coefficients should be interpreted relative to other recipients' coefficients. A coefficient of 0.1, for example, indicates that foreign bank exposure to that country increased by 10 percentage points more than exposure to the omitted recipient country in the regression. Omitted category: Argentina as recipient and Australia as lender

Table 3. First Stage Regression Results: Lender Effects (β_j)

Immediate Borrower basis and adjusted for coverage breaks

The estimating equation is $\Delta E_{ij} = \alpha_i i.recipient \times E_{ij} + \beta_j i.lender \times E_{ij} + \gamma_j i.self \times E_{ij}$

where: E_{ij} --exposure of country i banks to country j assets, as a percent of total international and domestic exposure of country i banks
i.recipient recipient effects, *i.lender* lender effects, *i.self* self-lender (home bias) effects

	2008h2-2012h1	2008h2	2009h1	2009h2	2010h1	2010h2	2011h1	2011h2	2012h1
Lenders effects*									
AT:Austria	-0.463***	-0.11***	-0.19***	0.05	0.05	-0.24**	0.04	-0.06	-0.07
BE:Belgium	-0.989***	-0.28***	-0.30***	-0.49***	0.04	-0.15**	-0.14*	-0.08	-0.08
CA:Canada	0.36**	0.06***	-0.21***	0.22***	0.16***	0.01	-0.05	0.003	0.04
DK:Denmark	-0.47***	-0.14***	-0.23***	-0.02	-0.06	-0.04	0.01	-0.1	0.05
FR:France	-0.42***	0.03*	-0.24***	0.01	0.01	-0.06	-0.004	-0.12**	-0.11*
DE:Germany	-0.52***	-0.11***	-0.22***	-0.01	0.06	-0.13**	-0.02	-0.11***	-0.09*
GR:Greece	-0.48**	0.04	-0.19***	0.09	-0.01	-0.25***	-0.09	-0.11*	0.06
IE:Ireland	-0.93***	-0.03***	-0.23***	0	-0.10***	-0.29***	-0.18***	-0.33***	-0.17***
IT:Italy	-0.81***	0.03***	-0.23***	0.004	-0.02	-0.29***	-0.18***	-0.33***	-0.18***
JP:Japan	0.3	0.11***	-0.11*	0.08***	0.10***	-0.01	-0.07	0.03	0.04
NL:Netherlands	-0.52***	-0.16***	-0.25***	0.03	0.089**	-0.06	0.04	-0.09	-0.16*
PT:Portugal	-0.36**	0.01	-0.13	0.01	0.06	-0.03	-0.12	-0.07	-0.03
ES:Spain	0.05	0.14***	-0.06	0.08***	0.01	-0.02	-0.02	-0.14***	0.03
SE:Sweden	-0.14	-0.12***	-0.17**	0.02	0.02	-0.09	0.1	0.07	-0.02
CH:Switzerland	-0.39**	-0.09***	-0.28***	0.04*	0.02	0.02	-0.04	-0.08**	-0.05
GB:United Kingdom	-0.262*	0.02	-0.15**	0.01	0.14***	-0.12*	0.03	0.02	-0.03
US:United States	0.2	0.07*	-0.13**	0.10***	0.14***	-0.15***	0.07	-0.07*	0.01

legend: *10%; **5%; ***1% significance level

*Lender effects correspond to the coefficient on a dummy variable for the lender interacted with initial exposure of the lender to the recipient. Coefficients should be interpreted relative to other lender coefficients.

A coefficient of 0.1, for example, indicates that a lender's exposure to all countries increased by 10 percentage points more than exposure of the omitted lender in the regression. Omitted category: Argentina as recipient and Australia as lender

Table 4. Second Stage Regressions: Recipient Effects (α_i) Regressed on Fundamentals

Data adjusted for coverage breaks

The estimating equation is $\alpha_i = C + \beta_1 IIR_i + \beta_2 growth_i$

where: α_i --recipient effects obtained in the first stage regressions

	Immediate Borrower Basis	Ultimate Risk Basis
Period: 2008h2		
Institutional Investor Rating (2008q2)	0.001	0.001
GDP growth (2008)	0.007	0.004
r2	0.01	0.01
#obs	61	61
Period: 2011h2		
Institutional Investor Rating (2011q2)	-0.001	0.001
GDP growth (2011)	0.005	0.012**
r2	0.06	0.13
#obs	61	61

legend: * p<.1; ** p<.05; *** p<.01

Table reports coefficient on fundamental in 4 regressions. Constant term not reported.
 GDP growth helps explain recipient effects on an ultimate risk basis, but country risk was not significant.

Table 5. Second stage regressions: Lender and Home Effects Regressed on Indicators of Bank Soundness

Immediate Borrower basis and adjusted for coverage breaks

	Lender Effects					Home Effects				
<i>Estimating equation:</i>	$\beta_i = C + d\text{Bank Soundness Indicator}$					$\gamma_i = C + d\text{Bank Soundness Indicator}$				
Period: 2008h2										
bank soundness 2008	0.01					-0.02				
change in bank soundness 2008-10		0.03					-0.06			
systemic banking crisis 2008			-0.08					0.09		
exposure güips 2008q2				-1.32*R					-0.26	
domestic lending/total lending 2008q2					0.39***R					-0.19
r2	0.01	0.06	0.12	0.26	0.44	0.01	0.07	0.05	0	
#obs	17	17	17	12	17	17	17	17	12	17
Period: 2011h2										
bank soundness 2010	0.06***R					-0.05				
change in bank soundness 2008-10		0.07***R					-0.08**			
systemic banking crisis 2011			-0.09**					0.08		
exposure güips 2011q2				-1.41**R					1.04	
domestic lending/total lending 2008q2					0.14					-0.14
r2	0.5	0.44	0.25	0.38	0.08	0.15	0.25	0.08	0.05	0.03
#obs	18	18	18	13	18	18	18	18	13	18

Legend: * p<.1; ** p<.05; *** p<.01. Constant term included but not presented.

R: indicates that results continue to be statistically significant when using ultimate risk basis. Significance level falls to 10% level for change in bank soundness.

Banking systems with small foreign exposures tended to maintain lending in the initial stage of the global financial crisis, while various bank soundness indicators help explain flows at the peak of the Eurozone crisis. The change in bank soundness helps explain the flight home at the peak of the Eurozone crisis.

Table 6. Second stage Regressions: Lender and Home effects Regressed on Country Risk and Sovereign Risk Ratings and Changes in Holdings of Government Debt, including Interactions with Systemic Banking Crisis

Immediate Borrower basis and adjusted for coverage breaks

	Lender Effects			Home Effects		
<i>Estimating equation:</i>	$\beta_i = C + dFundamental + eFundamental \times systemic\ crisis$			$\gamma_i = C + dFundamental + eFundamental \times systemic\ crisis$		
Period: 2011h2						
Institutional Investor Country Risk Rating (IIR)	0.00**			0		
IIR x systemic crisis	-0.00*			0		
Standard and Poor's Sovereign FC rating		0.01			-0.01	
SP FC rating x systemic crisis		-0.00*			0	
change in govt bonds*			1.11			-2.62
change in govt bonds* x systemic crisis			-2.62**R			4.03**R
r2	0.33	0.28	0.33	0.06	0.05	0.28
#obs	17	17	17	18	18	18

Legend: * p<.1; ** p<.05; *** p<.01. Constant term included but not presented.

*change in domestic bank exposure to government bonds between June 2008 and December 2011

R: indicates that results continue to be statistically significant when using exposures on an ultimate risk basis (though in this case significance level falls to 10% level).

The regressions provide evidence that increased government bond holdings at times of systemic banking crisis explain part of the flight home effect.

Table 7. Adding Bilateral Data on Geography and Relative Ratings

Data adjusted for coverage breaks

The estimating equation is $\Delta E_{ij} = \alpha_i i.recipient \times E_{ij} + \beta_j i.lender \times E_{ij} + \gamma_j i.self \times E_{ij} + \delta_{ij} bilateral\ variable_{ij} \times E_{ij}$

where: E_{ij} --exposure of country i banks to country j assets, as a percent of total international and domestic exposure of country i banks
i.recipient recipient effects, *i.lender* lender effects, *i.self* self-lender (home bias) effects, bilateral variable: distance, contiguity, language, IIR

	Immediate Borrower Basis	Ultimate Risk Basis
Period: June 2008-June 2012		
Distance	-0.13***	-0.13**
Contiguity dummy	0.17*	0.22***
Common official language dummy	-0.11	-0.16**
Institutional Investor Rating (2008q2) Recip - Lender	-0.01*	-0.01**
r2	0.97	0.98
#obs	978	920
Period: 2008h2		
Distance	-0.04***	-0.06***
Contiguity dummy	-0.05**	-0.08**
Common official language dummy	0.03	0.04
Institutional Investor Rating (2008q2) Recip - Lender	0	0
r2	0.97	0.97
#obs	983	958
Period: 2011h2		
Distance	0.01	0.01
Contiguity dummy	0.21***	0.26***
Common official language dummy	0.12*	-0.03
Institutional Investor Rating (2011q2) Recip - Lender	0	-0.03
r2	0.9	0.86
#obs	974	926

Legend: * p<.1; ** p<.05; *** p<.01

All variables are interacted with initial exposure. Recipient, lender, self-lender variables included but not reported.

For the period as a whole, distance reduces inflows, while contiguity helps maintain inflows as expected. Common official language and gap between recipient and lender IIR ratings reduce inflows, contrary to expectations.

Table 8. Flight home effect: coefficients on “self-lending” (γ_i)
Period June 2008-June 2012

	Immediate Borrower		Ultimate Risk	
	Incl. Sales	Intrinsic margin	Incl. Sales	Intrinsic margin
AU: Australia	0.56	0.53	0.59	0.59
AT: Austria	0.41	0.21	0.58	0.35
BE: Belgium	0.21	0.36	0.18	0.18
CA: Canada	-0.34	-0.35	-0.37	-0.35
DK: Denmark	-0.04	-0.08		
FR: France	0.36	0.37	0.33	0.42
GE: Germany	0.3	0.24	0.37	0.37
GR: Greece	0.31	0.29	0.35	0.33
IE: Ireland	0.92	0.79	1.08	0.88
IT: Italy	0.84	0.94	0.62	0.65
JP: Japan	-0.27	-0.27	-0.25	-0.24
NL: Netherlands	0.57	0.04	0.64	0.19
PT: Portugal	0.49	0.28	0.57	0.41
SP: Spain	-0.02	0.28	-0.07	0.18
SE: Sweden	0.15	0.18	0.26	0.31
CH: Switzerland	0.15	0	0.19	0.1
UK: United Kingdom	0.18	0.2	0.27	0.31
US: United States	-0.3	-0.3	-0.2	-0.21
average	0.25	0.21	0.30	0.26
stdev	0.36	0.34	0.37	0.32

Incl. sales refers to the flight home effect calculated on the basis of changes in exposure including those resulting from sales and acquisitions of foreign banks. This data is only adjusted for changes in coverage (break 1). Intrinsic margin refers to changes in exposure of a given set of banks. This data is adjusted for breaks in coverage plus breaks resulting from sales and acquisitions. The flight home effect tends to be smaller on the intrinsic margin indicating that sales and acquisitions accentuated the flight home effect.

The flight home effect tends to be slightly larger on an ultimate risk basis.