# Deleveraging from Emerging Markets: the Case of Euro-area Banks

# Deleveraging from Emerging Markets: the Case of Euro-area Banks

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## Abstract

This paper shows stylized facts on the rather large retrenchment of cross-border lending by Euro-area banks into emerging markets. The clearest case is Asia where Euro-area banks have massively lost market share. The reason, however, is not only related to their retrenching but also to the surge in lending from others banks, especially from Emerging Asia. As a second step, we investigate empirically the determinants of cross-border bank flows with a gravity model and differentiate across Euro-area, US and Asian banks. We find a number of home factors behind the retrenchment in lending. Two are common to all home countries analyzed, namely *global risk aversion* and *trade* which, respectively, discourage and foster banks' overseas lending. Other factors, however, are specific of Euro-area banks, such as the *higher cost of funding* which is found to discourage lending while *poor economic growth* tends to foster it. The latter result would indicate that economic weakness of the last few years may have actually cushioned Euro-area banks' deleveraging from emerging markets. All in all, Euro-area banks' cross border lending appear to be more dependent on their cycle (both in terms of growth and external cost of funding) when compared with US and Asian banks.

# 1. Introduction

Cross-border banking flows, which had been very a major source of financing, especially for emerging economies, fell sharply after the Lehman event and have not fully recovered since.

The first banks to deleverage were US ones but their systemic relevance in cross-border finance had been rather limited during this decade. In turn, the most important players, namely banks from the Euro-area, extended their deleveraging process well beyond the Lehman event as a consequence of a sovereign crisis within their borders. In fact, funding and –sometimes- solvency pressures, as well as the sluggish demand for credit are behind the collapse in credit in the Euro-area and probably also the reduced financing muscle of banks in other geographies[1]. Given the leading role of Euro-area banks in cross-border lending across the globe and the high dependence of many emerging markets on bank international borrowing, it seems important to further understand what has happened with Euro-area banks' cross-border lending and how it may evolve in the future.

There is only scattered evidence on the degree of deleverage of Euro-area banks and, even less so, on the key reasons behind this trend. To answer this question, we conduct two sets of analyses. First, we describe – and compare – the trends in cross-border lending by Euro-area banks with those of US, UK and Japanese banks for different geographies in the emerging world. Secondly, we analyze the key factors behind such trends through panel regression. We also look into the potential differences in the determinants of cross-border lending for Euro-area banks as opposed to US banks.

While a number of similar studies have been conducted in the past, they do not look into the potentially different behavior of Euro-area banks nor do they cover the period of the European Sovereign Crisis, which should add a lot of new information to the question at stake in this paper. Our empirical results show that, other than the usual gravity variables (such as size and distance), *the increase in the cost of funding* which many Euro-area countries have experienced is a significant and relevant factor behind the reduction in cross-border lending only for Euro-area banks. On the other hand, lower growth at home appears to promote more bank lending abroad only in the case of Euro-area banks. The latter finding can be understood as a cushioning effect of Euro-area banks' deleveraging on their lending abroad as long as the Euro-area's growth continues to be sub-par. Higher global risk aversion, in turn, reduces cross-border lending independently on the bank's origin (also for US and Asian banks).

The paper is structured as follows. The next section investigates trends in cross-border bank lending, with a focus on Euro-area banks and differentiating across destinations. Section 3 conducts an empirical analysis on the determinants of cross border lending. After reviewing the data and methodology, we describe our results comparing Euro-area banks with US and Asian banks. Finally, some policy conclusions are drawn.

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1. For a review of European bank funding and deleveraging, see BIS (2012) and Feyen et al. (2012).

# 2. Stylized facts

To analyze the degree of Euro-area banks' deleveraging abroad, we first need to narrow down the definition of bank operations abroad. These can broadly be divided into so call "local" and cross-border. Local operations refer to those carried out by subsidiaries of foreign banks in countries different from the home one. Cross-border lending refers to loans (or other types of assets) extended from the headquarters (or a branch), i.e. the home country, to another one (the host). Given that local operations are generally financed by local savings, they are not really a source of international finance, except for the amount of capital allocated to the subsidiary. This brings us to focusing on cross-border lending in this paper since the question of interest in this paper is how Euro-area deleveraging may affect the financing of emerging economies. Furthermore, cross-border lending accounts for the bulk of activities abroad (namely more than 60% of total claims including those by subsidiaries).

The most comprehensive statistics of cross-border lending at a country level are those of compiled by the BIS under the name of "international claims". Given the nature of the business, for a long time concentrated in the developed world, a total of 25 mostly OECD countries report their bank lending abroad while over 200 countries report their borrowing from foreign banks (see Appendix 1 for a full list of countries). One of the first and foremost important conclusions to draw from analyzing this data is the need for expanding the list of reporting countries as a large chunk of flows is no longer captured in the list of existing home countries. By using more micro data on a subset of cross-border lending, namely syndicated loans, which we shall introduce in the second part of this section, a number of important lenders can be identified, such as China, Hong Kong and Singapore. In fact, understanding trends in cross-border bank flows in Asia with BIS data has become close to impossible in the absence of these home countries reporting.

Notwithstanding these data caveats, there still are a number of interesting conclusions that can be drawn from looking into the trends of cross-border lending. First of all, total cross-border loans have indeed fallen significantly since the peak, right before the Lehman event (Chart 1). Euro-area banks, which were the most important lenders since the beginning of our sample in 2000[2], continue to have the largest –albeit considerably reduced, share of total cross-border lending: from over 55% at its peak in 2003 to 37% in 2012 (Chart 2). The other relevant lenders, US, UK and Japanese banks have barely had 10% of market quota each but it has been much less volatile even during the Lehman crisis. Since then, they have all gained some market share but not to the extent of the loss of Euro-area banks. In other words, there are clearly other players, not yet reporting to the BIS, which have become relevant cross-border lenders.
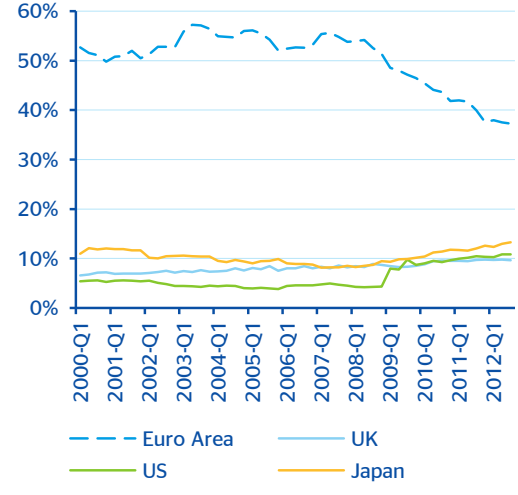
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2. We start in 2000 since the series is only half yearly, instead of quarterly, before and there is also a big gap between 1998 and 1999.

Chart 1
**Bank cross-border lending by home country**

bn USD
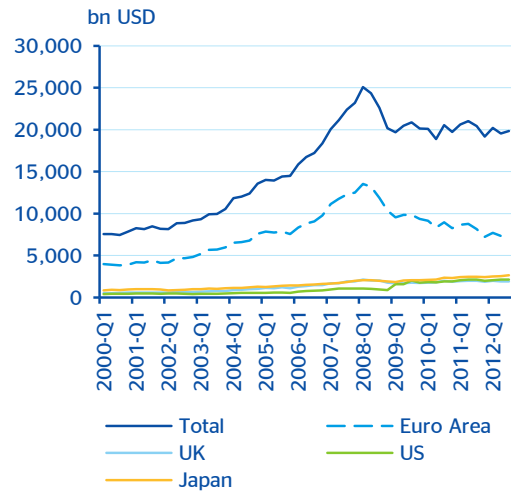


Source: BIS

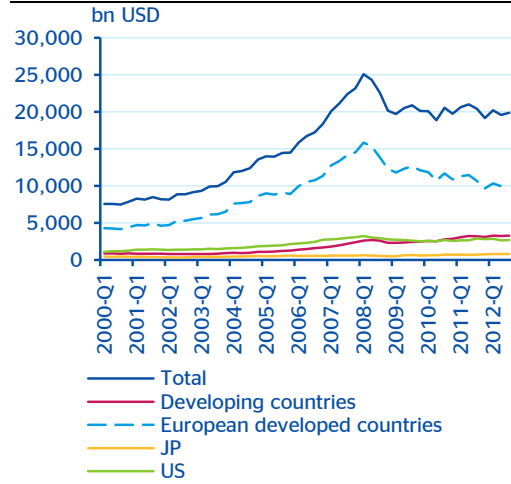Chart 2
**Share of cross-border lending by home country**



Source: BIS

The next obvious question to ask is who is suffering the most from the deleveraging of Euro-area banks. Looking at BIS data from the host country perspective, the clearest loser is developed Europe (Chart 3) with a reduction in cross-border bank financing from 15.8 trillion USD at its peak in 2008 to 10 trillion USD in late 2012. The US, which had never been a large recipient (hovering around 2.5-3.0 trillion USD) is not to far from the pre-crisis levels today. Finally, emerging countries have actually seen their overseas bank financing increase since the 2008-09 global crisis to close to 3.3 trillion USD now.
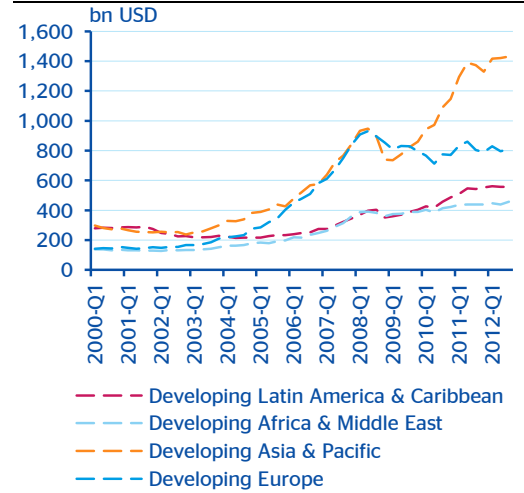
Within the emerging world, Asia & Pacific has experienced the largest rise in bank financing from early 2008 to now, from 300 billion in 2000 to 1.4 trillion USD in 2012 (i.e., a 380% increase compared to a 280% one for the average of the emerging world as shown in Chart 4). However, the current level of 1.4 trillion USD remains low when compared to the 10 trillion which Developed Europe still receives today. Latin America, the Middle East and Africa have also more than tripled the amount of cross-border bank financing but their current level is much smaller than that of Asia (about one third). Finally, Emerging Europe is the only region which has not yet recovered from the retrenching of cross-border bank financing after Lehman although recent trends are clearly better than for developed Europe as bank financing seems to have reached a plateau at 800 billion, from just 143 billion in 2000.

Chart 3
**Bank cross-border lending by host region**
bn USD



- Total
- Developing countries
- European developed countries
- JP
- US

Source: BIS

Chart 4
**Bank cross-border lending to emerging regions**
bn USD



- Developing Latin America & Caribbean
- Developing Africa & Middle East
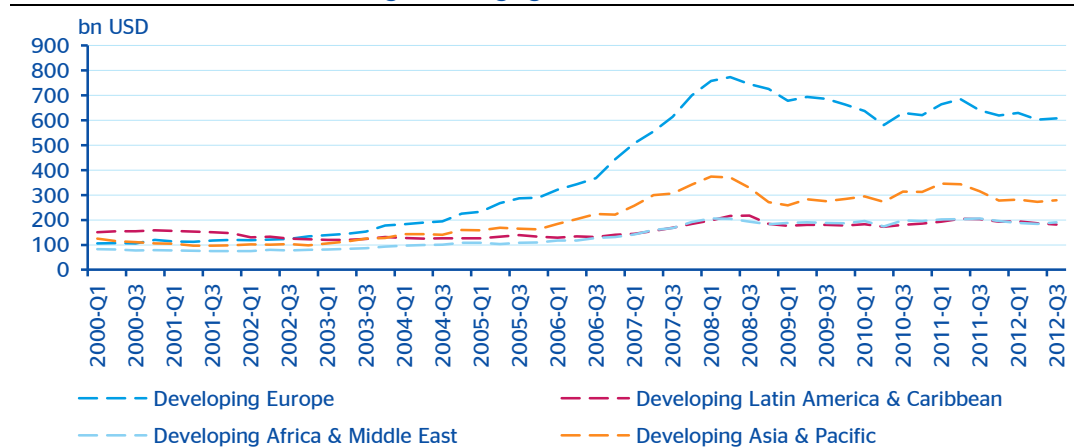- Developing Asia & Pacific
- Developing Europe

Source: BIS

We now focus on the role of Euro-area banks in the previously mentioned emerging regions. The largest retrenchment in lending from Euro-area banks has taken place in Emerging Europe, which also happens to be the largest emerging market for Euro-area banks (close to 800 billion USD right before the Lehman crisis and 600 billion today) (Chart 5). Asia has also experienced some moderate reduction, of 95 billion (to about 280 billion today from 374 billion before the Lehman crisis) in their cross-border financing from Euro banks since the Lehman crisis while Latin America, Africa and the Middle East have basically recovered from the moderate retrenchment in Euro-area banks' financing during the Lehman episode.

Interestingly, Emerging Europe has not only suffered the most from the deleveraging of Euro-area banks (Chart 6) but there has hardly been a switch from Euro-area banks to other lenders. In fact, the market share of Euro-area banks in the financing of Emerging Europe has fallen only slightly from 85% in 2008 to 75%  in 2012 (Chart 7) with US, UK and, specially, Japanese banks remaining to be minor players in this market.

Chart 5
**Euro-area bank cross-border lending on emerging countries**
bn USD



- Developing Europe
- Developing Africa & Middle East
- Developing Latin America & Caribbean
- Developing Asia & Pacific

Source: BIS

Chart 6
**Bank cross-border lending to
Emerging Europe by home country**

bn USD
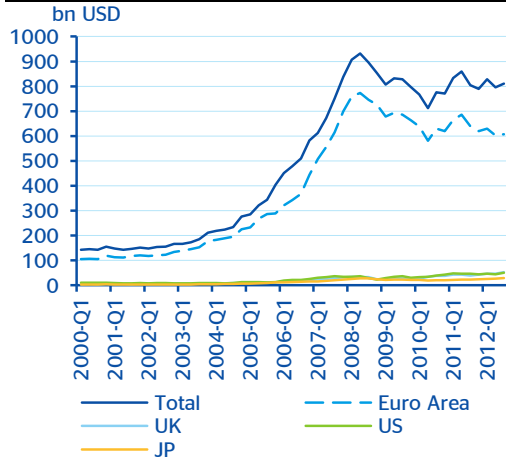


Source: BIS

Chart 7
**Share of cross-border lending to
Emerging Europe by home country**



Source: BIS

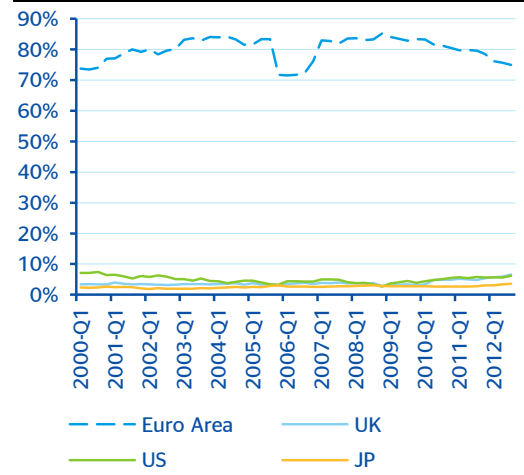In the case of Asia, Euro-area banks, which used to be the largest lenders have lost a lot of ground although they continue to be one key – if not still the most important – lender among the reporting ones. US and UK have gained ground but even more so have some new players such as Korean, Taiwanese and Australian banks (Chart 8). Japanese banks have remained quite stable since the 2008 crisis while the source of an increasingly important part of bank financing remains unidentified due to the absence of key reporting countries in Asia (especially China but also Hong Kong and Singapore). All together, Asia is now receiving 1.4 trillion in bank financing compared to as little as 300 billion in 2000. Euro-area banks have doubled the amount lent into emerging Asia from 125 billion in 2000 to 280 billion today (and from a peak of 374 billion before the Lehman event) but that is a minor increase compared to what has happened for the total amount of financing. There are, obviously, other geographies behind the boom in cross-border lending into Emerging Asia but the most relevant ones cannot be identified as they are not BIS reporting countries. Micro data (such as syndicated loans) points to China, Hong Kong and Singapore as key players. For the identifiable ones Taiwanese, Korean[3] and Australian banks have clearly stepped up their lending from very low levels and the same is true for UK banks and, to a lesser extent, US and Japanese banks. Given the surge in lending from other sources, Euro-area banks have suffered the largest loss in market share precisely in the region of the world which grows the most, namely Emerging Asia, from 45% at its peak to about 20% (Chart 9). The share of unidentifiable (but most probably Chinese, Hong Kong and Singapore banks) has grown the fastest with one third of total lending. Australian, Taiwanese and Korean banks have reached 8% of total cross-border lending and UK ones as much as 15%[4], which is more than what US banks currently lend into Asia (Chart 9).

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3. Korean banks only started to report in 2012. Furthermore they report consolidated and not international claims but, given the still scarce local presence of Korean banks abroad, we understand that the bulk of those foreign claims are cross-border loans (i.e., international claims).
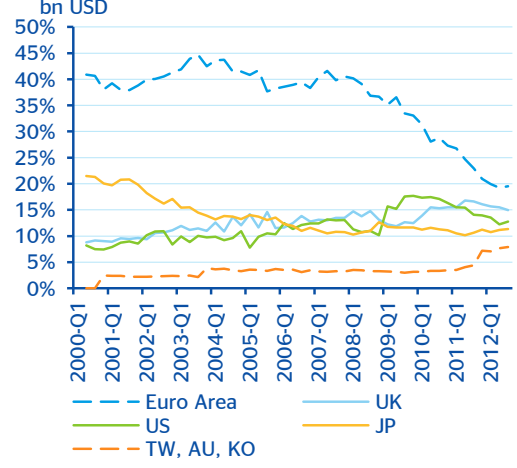4. We should note that HSBC and Standard Charter report to the BIS as UK banks, which explains a good part of that increase.

Chart 8
**Bank cross-border lending to
Emerging Asia by home country**

bn USD
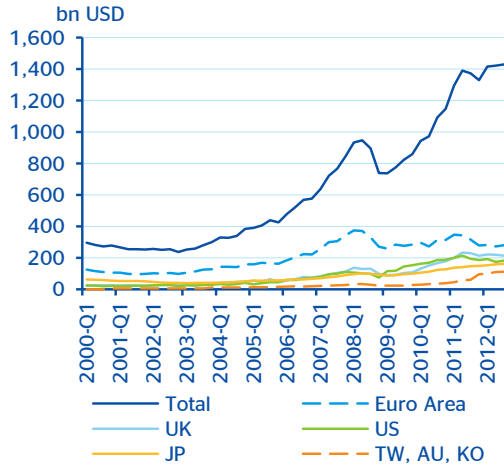
Note: Korea's data only available since 4Q2011
Source: BIS

Chart 9
**Share of cross-border lending to
Emerging Asia by home country**

bn USD

Note: Korea's data only available since 4Q2011
Source: BIS

In Latin America, Euro-area banks have also lost significant market share (from one half in 2009 to one third in 2012) although the amount of lending has remained more or less flat since 2009. The loss of market share stems from the growth of other lenders, which all in all have basically doubled since Lehman (Graph 10 and Graph 11). US banks, in turn, have gained market share quite aggressively.

Chart 10
**Bank cross-border lending to
Latin America by home country**

bn USD
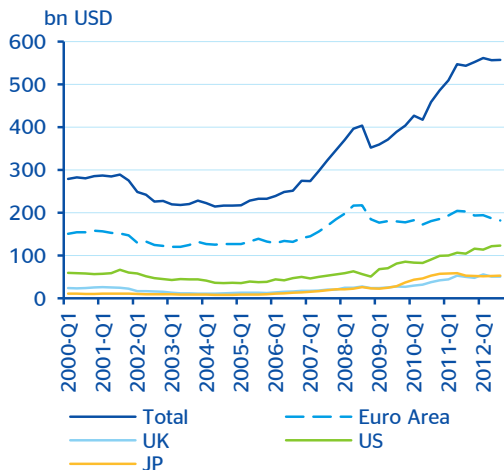
Source: BIS

Chart 11
**Share of cross-border lending to
Latin America by home country**
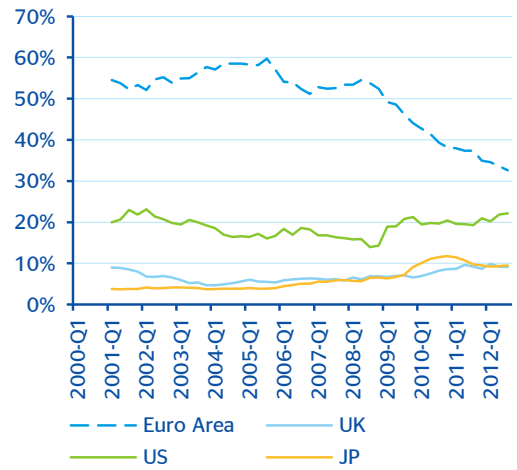
Source: BIS

The story is quite similar for the Middle East where total cross-border lending to the region has increased nearly one third since 2009 while cross-border lending from Euro-area banks has remained stagnant (Graph 12). This has resulted in a reduction of market share from 60% in 2000 to 40% now (Chart 12 and 13). UK banks have picked up more than half of that loss, moving from 10% of market share in 2000 to over 20% today.

Chart 12
**Bank cross-border lending to
Middle East by home country**



Source: BIS

Chart 13
**Share of cross-border lending to
Middle East by home country**



Source: BIS

Since BIS data is very aggregate, we now look at an easy identifiable – but still relevant – part of banks' cross-border lending activity, namely international syndicated loans as compiled by Bloomberg. Unfortunately, this sourc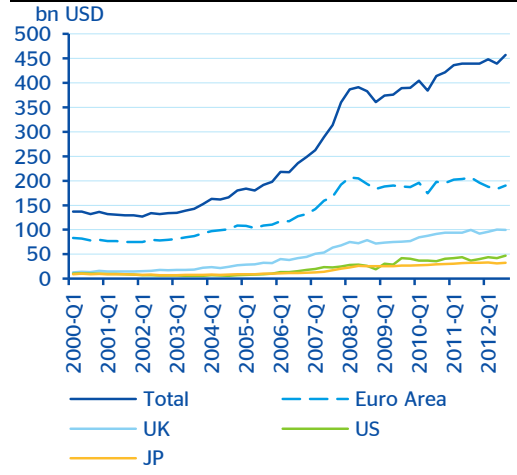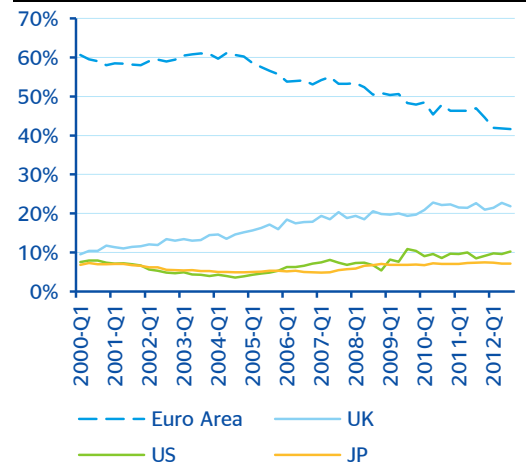e does not differentiate between Euro-area and other Western European banks (mainly UK and Swiss banks) so the trends found here cannot be compared fully with those with BIS data.

Notwithstanding the differences in definition, the general finding is similar: European banks have lost market share in international syndicated lending as a whole while US, Japanese and other Asian banks are taking up their market shares. Western Europe as destination is the exception to that rule since European banks have basically maintained their dominant market share in the syndicated loan market with a minor increase of Japanese banks (Chart 14).  In Emerging Europe, though, European banks' share has fallen from a peak of close to 90% in 2008 to 60% in 2012. During that period, US banks have gained market share reaching 15% (Chart 15).This trend is actually worse than what the aggregate cross-border lending slows described previously.

In the Middle East and North Africa (MENA), European banks' loss of market share is even more abrupt from levels close to 60% in 2005 to about 25% in 2012; that said, local banks instead of banks from other advanced economies (particularly the US and Japanese banks) have been the biggest winners (Chart 16). MENA local banks have tripled their market share from about 20% in 2005 to 60% in 2012. In Asia (excluding Japan), local banks' market share has risen by more than 20% from 42.8% in 2005 to 65% in 2012, in contrast to a big loss of about 25% of the market for European banks in the period (Chart 17); in Latin America, local banks have doubled the market share to 20% in 2012 from 2011, while European banks has lost about 5% of the market share (Chart 18).

Chart 14
**West Europe Syndicated Loan**
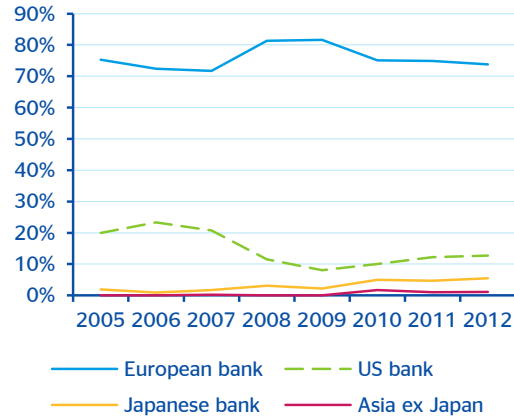


Source: Bloomberg

Chart 15
**Central & East Europe Syndicated Loan**
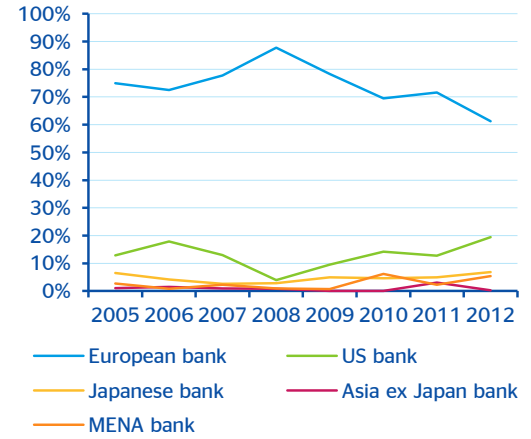


Source: Bloomberg

Chart 16
**MENA Syndicated Loan**
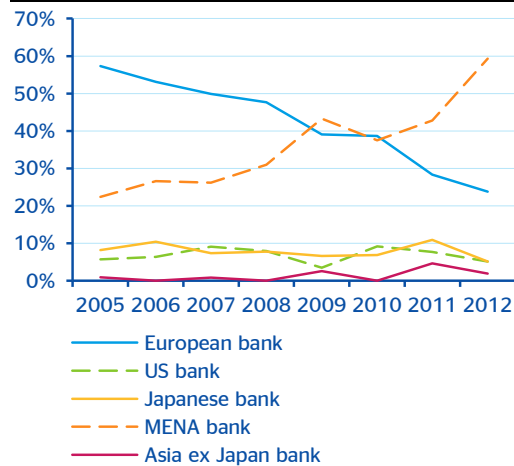


Note: MENA refers to Middle East and North Africa.
Source: Bloomberg

Chart 17
**Asia ex-Japan Syndicated Loan**
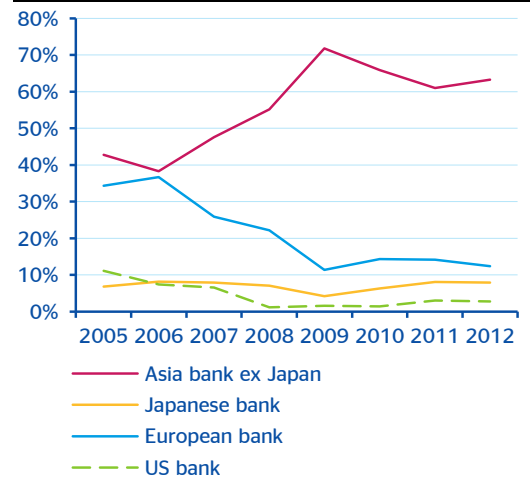


Source: Bloomberg

Chart 18
**Latin America's Syndicated Loans**
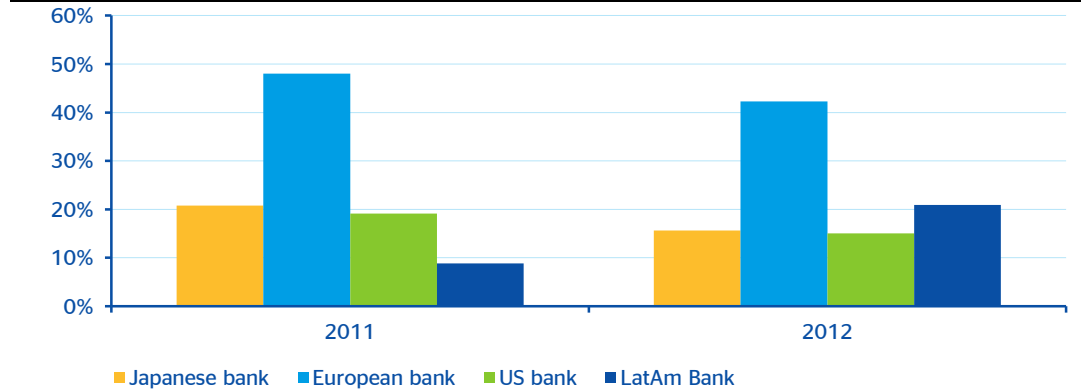


Source: Bloomberg; data only available for 2011 and 2012.

# 3. Determinants of cross-border lending : an empirical approach

The stylized facts analyzed above indicate that Euro-area banks have indeed deleveraged in their cross-border lending to emerging economies although the degree of deleveraging varies across emerging regions. This is generally true both when looking at aggregate cross-border lending and for the specific case of the international syndicated market. On that basis, it seems important to analyze empirically which are the key determinants of such behavior and what are the differences, if any, between Euro-area banks and others.

The existing literature on determinants of international bank flows follows two streams. The first one uses bank level data and focuses on which bank characteristics may foster, or discourage, cross-border lending.[5] The second stream uses bilateral country level data to assess which factors explain that banks in country *a* may prefer to invest in country *b* as opposed to country *c*. Such aggregate approach is geared towards analyzing the macroeconomic determinants of cross-border bank flows, both from the home and the host country perspective. This paper follows the latter approach since it is much closer to the question this paper intends to answer, namely what explains the broad-based deleveraging of European banks and why it has been more acute in some than for others.

We use BIS international claims, from 2000 to 2012, by all 25 reporting countries (i.e. home) with all counterparty countries (i.e. host), namely more than 200 as of today. The theoretical framework for our empirical strategy is that of a gravity model as in most other papers dealing with this question.[6] The key determinant of such models is distance, both physical and cultural,[7] but also size. For size, we look at size of the economy as well as the GDP per capita both in the home and host countries. Another potentially relevant determinant of bank cross-border flows is bilateral trade from country *a* into country *b* since part of the cross-border flows follow trade. Finally, we include three variables, which should give a sense of the economic and financial cycle either globally or in the home/host country[8]. These are economic growth both in the home and host countries, the external cost of funding in the home country, measured by the CDS (unfortunately, such cost of funding was not available for many host countries). The final variable is the degree of global risk aversion, measured by the S&P 500 VIX. Appendix 2 describes the data used and their sources. Appendix 3 shows the correlation between variables.

The next relevant issue is the choice of the methodology. Any empirical analysis of cross-border flows faces a number of challenges. First, the panel is bound to be unbalanced as some countries started to report after 2000 and many counterparty countries were absent in parts of the sample. Second, our stylized facts clearly show that the amount of cross-border lending is quite persistent. Third, endogeneity may be an issue, especially if a country heavily relies on bank financing to grow. Finally unobserved heterogeneity must exist in issue for some in a diverse sample of home and host countries. To our knowledge, the best methodology to tackle these issues is the Generalized Method of Moments (GMM), following Arellano and Bover (1995). To the best of our knowledge we are the first to use such methodology to analyze the determinants of bank flows, which adds to the novelty of our analysis.

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5. As an example, Goldberg (2005) uses bank level data to explore patterns in US bank claims on foreign partners.
6. One of the most influential papers is that of Buch (2005) who evaluates the evolving impact of distance on international banking activities. He finds that in general the impact of distance does not decrease across time. He also finds that cultural proximity (proxied by language) fosters bank flows. Later on, Blank and Buch (2007) use the BIS locational banking statistics of bilateral bank portfolios between OECD countries, and they go beyond distance and look at economic and financial size as well. The latter happen to be critical determinants of bank flows in the medium term.
7. We include both physical and cultural distance in a first set of regressions with a more rudimentary methodology (OLS with random effects in the table in the Appendix 2) to confirm the hypothesis that distance does discourages bank flows, confirming the hypothesis of a gravity model. As will be explained later, we opt for the GMM methodology for our benchmark regression which implies that time invariant variables such as distance need to be dropped.
8. Herrmann and Mihaljek (2010) also include growth and global risk aversion for a smaller sample (17 advanced to 28 emerging market economies) and find them significant as we do. However, their sample finishes in 2008 when the global crisis started and does not include the cost of funding in the home country which we find to be an important factor behind the deleveraging.

The Arellano-Bover estimator – also called system GMM estimator – combines the regression expressed in first differences (lagged values of the variables in levels are used as instruments) with the original equation expressed in levels (this is instrumented with lagged differences of the variables) and allows to include some additional instruments.

We prefer this option to a fixed-effect estimator for several reasons. First, it takes into account unobserved time-invariant bilateral specific effects, which are key for a bilateral data set like ours. Second, it tackles the potential endogeneity arising from the inclusion of the lagged dependent variable (to capture the persistence of financial flows) and other potentially endogenous variables in the right-hand side of the equation, especially economic growth in the host country. Third, it deals with the possibility that the dependent variable may not be stationary or, at least, highly persistent[9]. Finally, a high degree of efficiency is achieved by considering all possible instruments.  In any event, as a robustness test, we also report the results with the fixed effect GMM estimation method. They actually do not differ much.

The general disadvantage of a GMM estimator, namely that its properties hold asymptotically, should not be a big issue for our sample of 34.443 observations. Even when we break down the sample into different home countries, the minimum sample we have is for US banks, which still counts with 845 observations. The other disadvantage is that we cannot include time-invariant regressors (like distance variables) since their coefficients are not identifiable with this methodology (nor with the fixed effect GMM for that matter). This does not imply however that there is a problem of omitted variables since they are all included in the time-invariant country-specific effects. In order to check the significance of distance, being a key variable for our gravity model, we also use a simple OLS estimation for our panel including fixed effects.

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9. In any event. we test for non stationarity of cross-border lending and we reject the hypothesis.

# 4. Empirical results

In this section we focus on the results obtained with the best possible estimation method (system GMM) in Table 1 below. Results for fixed effect GMM and OLS with random effects can be found in the Appendix 4 and 5.

Our estimation shows that the classical gravity model applies well to cross-border lending between countries. The geographical and cultural distance variables are significant (Appendix 5). The closer two countries, the more cross-border bank flows they have. Size is also relevant although not in all forms and for all countries: GDP size and GDP per capita are significant, as one would expect, but only for mainly for the host country[10]. Furthermore, the way in which host country size matters is different for Euro-area banks than for the rest. Euro-area banks care for the income per capita of the host country and not so much for its economic size. The opposite is true for US and Asian banks.

The home country wealth (measured by its GDP per capita) is weakly significant only in the case of Euro-area banks (at 85% significance level) but with an unexpected sign, negative. It would seem as if the wealthier the home country (within Euro-area), the less its banks may lend abroad. A revision of the data can shed some light about this interesting result. In fact, banks from countries with relatively lower income per capita, namely Spain but also Italy to some extent, had for years increased their lending overseas more aggressively than German banks. In turn, US and Asian banks' cross-border lending does not seem to be influenced by the wealth of their countries of origin.

The amount of bilateral trade is found significant as one would expect[11]. Besides, its impact (in terms of the size of the estimated coefficient) is found to be much larger for US banks than Euro-area and Asian banks.

Moving to economic and financial cyclical conditions, a recession in Euro-area appears to increase bank cross-border lending. Given that growth in Europe has been subpar during the last few years, our results point to a cushioning effect on overseas lending which we do not find ( for US and Asian banks. Another interesting result which only applies to Euro-area banks is the clearly negative impact of the external cost of funding of the home country. In fact, an increase in the home country CDS clearly reduces cross-border lending. Finally, higher global risk aversion is also found to reduce bank lending abroad but this is true for all banks (even for US and Asian). This result underscores the systematic risk in the global financial system which has only increased with financial globalization.

As a whole, Euro-area banks are found to be more dependent on their local macroeconomic circumstances (both in terms of growth and external cost of funding) when compared with US and Asian banks. This finding helps explain the larger extent of retrenchment of Euro-area banks when compared with US banks even in times of similar difficulties (such as the Lehman event) and also the loss in the market share. There are surely other factors behind the deleveraging of European banks which this aggregate analysis cannot capture (such as bank specific issues) but this higher sensitivity to their home cycle looks like an important factor for Euro-area economic authorities to consider.

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10. The result is consistent with Blank and Buch (2007), who also find a significant and positive impact of the host country GDP on cross-border bank flows but they do not find some conclusive evidence for the size of the home country GDP.
11. Forbes and Chinn (2003) and Blank and Buch (2007) also find a positive and significant relationship between trade and cross-border international financing activities.

Table 1:
## Result of system GMM estimation

| Dependent variable: Cross-border lending | All sample | Euro-area reporting countries | United States | Asian reporting countries |
|---|---|---|---|---|
| Lagged cross-border lending | 0.766*** (0.000) | 0.813*** (0.000) | 0.528*** (0.000) | 0.840*** (0.000) |
| Home country GDP | -0.054 (0.820) | 0.427 (0.169) | | 0.800 (0.417) |
| Host  country GDP | 0.306*** (0.0000) | 0.073 (0.306) | 1.169*** (0.008) | 0.450*** (0.000) |
| Home country GDP per capita | -0.101 (0.728) | -0.576* (0.079) | | -1.068 (0.311) |
| Host country GDP per capita | 0.249*** (0.001) | 0.361*** (0.000) | | -0.045 (0.734) |
| Bilateral trade to  home country GDP | 0.040*** (0.000) | 0.025** (0.013) | 0.261** (0.012) | 0.081*** (0.002) |
| Home country GDP growth (change) | -0.205** (0.014) | -0.430*** (0.000) | -0.398 (0.336) | 0.053 (0.746) |
| Host country GDP growth (change) | -0.079 (0.203) | -0.111* (0.119) | 0.226 (0.508) | -0.166 (0.206) |
| Global risk aversion | -0.001*** (0.000) | -0.002*** (0.000) | -0.003** (0.039) | -0.002** (0.012) |
| Home country cost of funding abroad | -0.00995*** (0.000) | -0.009*** (0.000) | -0.213 (0.249) | -0.031* (0.133) |
| Observations: | 34,443 | 21,449 | 845 | 2,956 |

Note: p value in the parenthesis. *15% significant level;**5% significant level;***1% significant level.
Source: Authors' estimation of System GMM via Arellano and Bover (1995).

# 5. Conclusions

This paper follows a two-step approach to analyze the trends in Euro-area banks' lending overseas with particular attention to emerging economies.

As a first step, aggregate, as well as some sector specific, data on cross-border lending point to a rather large retrenchment in cross-border lending by Euro-area banks in emerging markets. However, the degree of deleveraging varies significantly across emerging regions. The clearest case is Asia where Euro-area banks have massively lost market share. The reason, however, is not only related to their retrenching but also to the surge in lending from Asian banks. US and UK banks are also coming back but in a much more moderate way than Asian ones. On the opposite side we have Emerging Europe where Euro-area banks, notwithstanding their retrenchment, have lost a relatively small market share. In Latin America and the Middle East, Euro-area banks have basically maintained the level of lending but have lost a big part of their market share. US banks have substantially increased their presence in Latin America while UK banks have become more relevant in the Middle East.

As a second step, we investigate empirically the determinants of cross-border bank flows with a gravity model as a framework. We also assess whether such determinants differ for Euro-area banks and others (basically US and Asian ones). Other than the usual gravity variables (geographical and cultural distance, size and GDP per capita), there are a number of home factors that may be behind the retrenchment of Euro-area banks from lending abroad. Two are common to all home countries analyzed, namely global risk aversion and trade which, respectively, discourage and foster banks' overseas lending. Other factors, however, are specific of Euro-area banks, such as the higher cost of funding which is found to discourage lending while poor economic growth tends to foster it. The latter result would indicate that the poor economic performance of the Euro area since the Lehman event onwards may have acted as a cushion for Euro-area banks to retrench less than it would otherwise have been the case.

All in all, our empirical analysis shows that Euro-area banks are more dependent on their cycle (both in terms of growth and external cost of funding) when lending abroad when compared with US and Asian banks. It is hard to argue that such dependence is behind the larger deleveraging of European banks since the poor growth factor actually acts as a cushion. However, such dependence, coupled with the still large – even if reduced – role of Euro-area banks in financing emerging markets makes this finding relevant for economic authorities to analyze further, especially as concerns the means to moderate the cyclical dependence.

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# Appendix 1: Lists of BIS Reporting and counterparty countries of international claims

Table 2
**Lists of BIS reporting and counterparty countries of international claims**

| Reporting countries | Counterparty countries | | | |
|---|---|---|---|---|
| **Asia & Pacific** | **Asia & Pacific** | **Developed Europe** | **Africa & Middle East** | **Latam** |
| **Australia** | Afghanistan | Finland | Algeria | Argentina |
| **Japan** | Armenia | France | Angola | Aruba |
| **Taiwan** | Australia | Germany | Bahrain | Bahamas |
| | Azerbaijan | Gibraltar | Benin | Barbados |
| | Bangladesh | Greece | Botswana | Belize |
| **Europe** | Bhutan | Guernsey | Burkina Faso | Bermuda |
| **Austria** | Brunei | Iceland | Burundi | Bolivia |
| **Belgium** | Cambodia | Ireland | Cameroon | Brazil |
| **Denmark** | China | Isle of Man | Cape Verde | Cayman Islands |
| **Finland** | Fiji | Italy | Central African Rep | Chile |
| **France** | French Polynesia | Jersey | Chad | Colombia |
| **Germany** | Georgia | Liechtenstein | Comoros | Costa Rica |
| **Greece** | Hong Kong | Luxembourg | Congo | Cuba |
| **Ireland** | India | Malta | Congo Democratic Rep | Dominica |
| **Itlay** | Indonesia | Netherlands | Cote d'Ivoire | Dominican Republic |
| **Netherlands** | Japan | Norway | Djibouti | Ecuador |
| **Portugal** | K Overseas Territories | Portugal | Egypt | El Salvador |
| **Spain** | Kazakstan | Slovakia | Equatorial Guinea | Falkland Islands |
| **Sweden** | Kiribati | Slovenia | Eritrea | Grenada |
| **Switzerland** | Korea | Spain | Ethiopia | Guatemala |
| **Turkey** | Kyrgyz Republic | UK | Gabon | Guyana |
| **UK** | Lao P.D.R. | Vatican | Gambia | Haiti |
| | Lebanon | | Ghana | Honduras |
| **North America** | Macao | **Developing Europe** | Guinea | Jamaica |
| **Canada** | Malaysia | Albania | Guinea-Bissau | Mexico |
| **US** | Maldives | Belarus | Iran | Netherlands Antilles |
| | Marshall Islands | Bosnia & Herzegovina | Iraq | Nicaragua |
| **Latam** | Micronesia | Bulgaria | Israel | Panama |
| **Brazil** | Mongolia | Croatia | Jordan | Paraguay |
| **Chile** | Myanmar | Czech Republic | Kenya | Peru |
| **Mexico** | Nauru | Estonia | Kuwait | St. Lucia |
| **Panama** | Nepal | Hungary | Lesotho | St. Vincent |
| | New Caledonia | Latvia | Liberia | Suriname |
| | New Zealand | Lithuania | Libya | Trinidad & Tobago |
| | North Korea | Macedonia, FYR | Madagascar | Turks & Caicos |
| | Pakistan | Moldova | Malawi | Uruguay |
| | Palau | Montenegro | Mali | Venezuela |
| | Papua New Guinea | Poland | Mauritania | |
| | Philippines | Romania | Mauritius | |
| | Samoa/W. Samoa | Russia | Morocco | |
| | Singapore | Serbia | Mozambique | |
| | Solomon Islands | Serbia & Montenegro | Namibia | |

Table 2
**Lists of BIS Reporting and counterparty countries of international claims (Cont.)**

| Reporting countries | Counterparty countries | | |
|---|---|---|---|
| | **Asia & Pacific** | **Developing Europe** | **Africa & Middle East** |
| | Sri Lanka | Turkey | Niger |
| | Taiwan | Ukraine | Nigeria |
| | Tajikistan | Yugoslavia | Oman |
| | Tokelau | | Qatar |
| | Tuvalu | **North America** | Rwanda |
| | Uzbekistan | US | Sao Tome & Principe |
| | Vanuatu | Canada | Saudi Arabia |
| | Wallis & Futuna | | Senegal |
| | | | Seychelles |
| | | | Sierra Leone |
| | | | Somalia |
| | | | South Africa |
| | | | St. Helena |
| | | | Sudan |
| | | | Swaziland |
| | | | Syrian Arab Republic |
| | | | Togo |
| | | | Tunisia |
| | | | United Arab Emirates |
| | | | Yemen Arab Rep |
| | | | Yemen, Rep of |
| | | | Zambia |
| | | | Zimbabwe |

Source: Authors' estimation

# Appendix 2: Description of data

Table 3
**Description of Data**

| Year: 2000-2012 | Mean | Maximum | Minimum | Observations | Data Source |
|---|---|---|---|---|---|
| Bilateral cross-border lending (mn USD)[1] | 2,979 | 273,201 | -268 | 67,296 | BIS |
| Home country GDP (bn 2000 US$)[1] | 1,026 | 11,744 | 12.45 | 67,296 | IMF |
| Host country GDP (bn 2000 US$)[1] | 209 | 5,218 | 0.25 | 67,296 | IMF |
| home country population (thousand)[1] | 56,164 | 313,085 | 3126 | 67,296 | UN |
| host country population (thousand)[1] | 46,644 | 1,347,565 | 56 | 67,296 | UN |
| Exports from home country to host country (mn USD)[1] | 1,961 | 280,764 | 0 | 67,296 | IMF |
| Imports to home country from host country (mn USD)[1] | 2,225 | 417,354 | 0 | 67,296 | IMF |
| Home country GDP growth | 1.6% | 12.1% | -7.1% | 67,296 | IMF |
| Host country GDP growth | 3.8% | 34.4% | -32.9% | 67,296 | IMF |
| Total credit's ratio to GDP | 64% | 330% | 1% | 67,296 | WB |
| Cultural distance* | 2.19 | 3.00 | 1 | 67,296 | Authors' calculation |
| Geographic distance* | 1.81 | 2.00 | 1 | 67,296 | Authors' calculation |
| Global risk aversion: the S&P VIX | 22.05 | 44.14 | 11.39 | 67,296 | Bloomberg |
| Home country cost of funding abroad: CDS of 5 yr treasury bond of home (bps) | 136 | 3,790 | 1 | 67,296 | Bloomberg |

*Cultural distance: 1=in the same language block; 2=neither in any language block; 3=in different language block; Geographic distance:
1= in the same region/continent; 2=not in the same region/continent.
Source: BIS, IMF, WB, and Bloomberg
Note: 1 in log terms in all regressions

# Appendix 3: Bilateral correlation table

Table 4
**Bilateral correlation**

| Correlation | cross-border lending | Home country GDP | Host country GDP | GDP per capita | Exports from home country to host country | Imports to home country from host country (mn USD) [1] | Home country GDP growth | Host country GDP growth | Global risk aversion | Home country cost of funding abroad | Home country total credit's ratio to GDP | Host country total credit's ratio to GDP | Cultural distance | Geographic distance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cross-border lending* | 1.00 | 0.43 | 0.32 | 0.43 | 0.68 | 0.63 | -0.13 | -0.16 | 0.05 | -0.13 | -0.04 | 0.02 | -0.12 | -0.27 |
| Home country GDP* | 0.43 | 1.00 | -0.16 | 0.48 | 0.61 | 0.71 | 0.07 | -0.12 | 0.01 | 0.06 | 0.01 | 0.05 | 0.09 | -0.07 |
| Host country GDP* | 0.32 | -0.16 | 1.00 | -0.15 | 0.17 | 0.02 | -0.32 | 0.03 | 0.06 | -0.38 | -0.09 | 0.03 | -0.16 | 0.08 |
| GDP per capita* | 0.43 | 0.48 | -0.15 | 1.00 | 0.33 | 0.36 | 0.05 | -0.28 | 0.01 | 0.07 | 0.01 | -0.04 | 0.14 | -0.15 |
| Exports from home country to host country* | 0.68 | 0.61 | 0.17 | 0.33 | 1.00 | 0.83 | -0.09 | -0.09 | 0.03 | -0.08 | 0.01 | 0.04 | -0.06 | -0.26 |
| Imports to home country from host country (mn USD) * | 0.63 | 0.71 | 0.02 | 0.36 | 0.83 | 1.00 | -0.03 | -0.11 | 0.02 | -0.02 | 0.01 | 0.06 | -0.01 | -0.26 |
| Home country GDP growth | -0.13 | 0.07 | -0.32 | 0.05 | -0.09 | -0.03 | 1.00 | 0.28 | -0.38 | -0.15 | 0.07 | -0.05 | 0.00 | -0.02 |
| Host country GDP growth | -0.16 | -0.12 | 0.03 | -0.28 | -0.09 | -0.11 | 0.28 | 1.00 | -0.22 | -0.06 | 0.01 | -0.02 | -0.05 | 0.11 |
| Global risk aversion | 0.05 | 0.01 | 0.06 | 0.01 | 0.03 | 0.02 | -0.38 | -0.22 | 1.00 | 0.20 | 0.02 | 0.07 | -0.01 | 0.01 |
| Home country cost of funding abroad | -0.13 | 0.06 | -0.38 | 0.07 | -0.08 | -0.02 | -0.15 | -0.06 | 0.20 | 1.00 | 0.06 | 0.01 | 0.02 | -0.01 |
| Home country total credit's ratio to GDP | -0.04 | 0.01 | -0.09 | 0.01 | 0.01 | 0.01 | 0.07 | 0.01 | 0.02 | 0.06 | 1.00 | 0.01 | 0.03 | -0.01 |
| Host country total credit's ratio to GDP | 0.02 | 0.05 | 0.03 | -0.04 | 0.04 | 0.06 | -0.05 | -0.02 | 0.07 | 0.01 | 0.01 | 1.00 | -0.01 | 0.01 |
| Cultural distance | -0.12 | 0.09 | -0.16 | 0.14 | -0.06 | -0.01 | 0.00 | -0.05 | -0.01 | 0.02 | 0.03 | -0.01 | 1.00 | 0.20 |
| Geographic distance | -0.27 | -0.07 | 0.08 | -0.15 | -0.26 | -0.26 | -0.02 | 0.11 | 0.01 | -0.01 | -0.01 | 0.01 | 0.20 | 1.00 |

Note:*in log terms
Source: Authors' calculation

# Appendix 4: Result of fixed effect GMM estimation

Table 5
Result of fixed effect GMM estimation

| Dependent variable: Cross-border lending | Dependent variable: log of intl claims | All sample | Euro-area reporting countries | United States | Asian reporting countries |
|---|---|---|---|---|---|
| Lagged cross-border lending | lag 1 of log of intl claims | 0.766*** (0.000) | 0.813*** (0.000) | 0.528*** (0.000) | 0.840*** (0.000) |
| Home country GDP | log of home GDP (in 2000 USD) | -0.054 (0.820) | 0.427 (0.169) | | 0.803 (0.416) |
| Host country GDP | log of host GDP (in 2000 USD) | 0.306*** (0.000) | 0.073 (0.306) | 1.169*** (0.008) | 0.450*** (0.000) |
| Home country GDP per capita | log of home GDP per capita (in 2000 USD) | -0.101 (0.728) | -0.576* (0.079) | | -1.070 (0.311) |
| Host country GDP per capita | log of host GDP per capita (in 2000 USD) | 0.249*** (0.001) | 0.361*** (0.000) | | -0.045 (0.739) |
| Bilateral trade to home country GDP | log of total bilateral trade's ratio to home GDP | 0.040*** (0.000) | 0.025** (0.013) | 0.261** (0.012) | 0.081*** (0.002) |
| Home country GDP growth (change) | home growth change | -0.205** (0.014) | -0.430*** (0.000) | -0.398 (0.336) | 0.053 (0.746) |
| Host country GDP growth (change) | host growth change | -0.079 (0.203) | -0.111* (0.119) | 0.226 (0.508) | -0.166 (0.206) |
| Global risk aversion | S&P VIX | -0.001*** (0.000) | -0.002*** (0.000) | -0.003** (0.039) | -0.002** (0.016) |
| Home country cost of funding abroad | home CDS (in 100 bps) | -0.00995*** (0.000) | -0.009*** (0.000) | -0.213 (0.249) | -0.031* (0.133) |
| Observations: | Observations: | 36,159 | 22,396 | 948 | 3,092 |

Note: p value in the parenthesis. *15% significant level;**5% significant level;***1% significant level.
Source: Authors' estimation

# Appendix 5: Result of OLS estimation with random effects

Table 6
**Result of OLS estimation with random effects**

| Dependent variable: Cross-border lending | All sample | Euro-area reporting countries | United States | Asian reporting countries |
|---|---|---|---|---|
| Lagged cross-border lending | 0.960*** (0.000) | 0.963*** (0.000) | 0.940*** (0.000) | 0.970*** (0.000) |
| Home country GDP | 0.009*** (0.002) | 0.021*** (0.000) | | -0.010 (0.894) |
| Host country GDP | 0.025*** (0.000) | 0.021*** (0.000) | 0.055*** (0.000) | 0.034*** (0.000) |
| Home country GDP per capita | 0.028*** (0.000) | -0.036*** (0.004) | | 0.079 (0.818) |
| Host country GDP per capita | 0.023*** (0.000) | 0.022*** (0.000) | 0.034*** (0.005) | 0.023*** (0.001) |
| Bilateral trade to home country GDP | 0.028*** (0.000) | 0.026*** (0.000) | 0.037*** (0.004) | 0.032*** (0.000) |
| Home country GDP growth (change) | -0.071 (0.395) | -0.081 (0.489) | 0.291 (0.441) | -0.077 (0.632) |
| Host country GDP growth (change) | -0.014 (0.823) | -0.086 (0.211) | 0.326 (0.280) | -0.075 (0.547) |
| Global risk aversion | -0.003*** (0.000) | -0.003*** (0.000) | -0.004*** (0.005) | -0.003*** (0.000) |
| Home country cost of funding abroad | -0.006*** (0.000) | -0.008*** (0.000) | -0.136 (0.343) | -0.017 (0.320) |
| Geographic distance | -0.032*** (0.000) | -0.038*** (0.000) | | -0.006 (0.744) |
| Cultural distance | -0.018*** (0.001) | -0.027*** (0.000) | | |
| Observations: | 36,159 | 22,396 | 948 | 3,092 |

Note: OLS model is estimated by a random effect model. p value in the parenthesis. *15% significant level;**5% significant level;***1% significant level.
Geographic distance is defined as within the same region or not, and cultural distance is defined as using the same language or not (specifically English or Spanish).
Source: Authors' estimation

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