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Financial crises and the composition of cross-border lending

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ABSTRACT

We examine the composition and drivers of cross-border bank lending between 1995 and 2012, distinguishing between syndicated and non-syndicated loans. We show that on-balance sheet syndicated loan exposures, which account for almost one third of total cross-border loan exposures, increased during the global financial crisis due to large drawdowns on credit lines extended before the crisis. Our empirical analysis of the drivers of cross-border loan exposures in a large bilateral dataset leads to three main results. First, banks with lower levels of capital favor syndicated over other kinds of cross-border loans. Second, borrower country characteristics such as level of development, economic size, and capital account openness, are less important in driving syndicated than non-syndicated loan activity, suggesting a diversification motive for syndication. Third, information asymmetries between lender and borrower countries became more binding for both types of cross-border lending activity during the recent crisis.

1. Introduction

The past two decades have witnessed a remarkable increase in cross-border bank lending activity. Between 1995 and 2012, total cross-border loan claims almost tripled to reach 20 trillion U.S. dollars. Some of this activity is conducted in the form of syndicated loans, in which a group of financial

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institutions (a syndicate) supplies funds to an individual borrower (a firm or a sovereign) under a single loan agreement. Loan syndications help lenders overcome balance sheet constraints and reduce the concentration of risks by limiting exposures to individual borrowers. Smaller lenders benefit from the informational advantages of larger banks to diversify risks across countries and borrowers to which they would otherwise not have access. How important the syndicated loan market is relative to total cross-border bank lending operations and what drives it are still open questions. In this paper, we describe the composition of cross-border bank lending during 1995–2012, focusing on syndicated loans, and examine its evolution and drivers.

We begin by documenting stylized facts about the share of syndicated lending in cross-border bank loan exposures. We find that syndicated loan exposures ('SLEs') represent between 20 percent of total loan claims early in the sample to over 30 percent in later years. On average the share of SLEs in total loan claims is higher for advanced economy (AE) borrowers (30 percent) compared to emerging market economy (EME) borrowers (18 percent). Non-syndicated loan exposures ('non-SLEs'), which include bilateral (single-lender loans) and intragroup lending (loans among entities of the same banking group) account for the remainder.[1]

Next, we analyze the effects of the global financial crisis (2008–2012) on the composition of cross-border loan exposures. We find an increase in SLEs outstanding (stocks) during the crisis despite a collapse in syndicated loan origination (new deals).[2] This was driven by an increase in drawdowns on existing syndicated loan commitments (credit lines). Our estimates suggest that credit line usage rate increased from approximately 25 percent before the global financial crisis to 52 percent by 2012. Effects related to the longer maturity of the syndicated loans extended in the pre-crisis boom may also have played a role.

We next identify the key drivers of loan syndication activity compared to other types of cross-border lending, and provide evidence for several motives behind the choice of syndication. For the empirical analysis, we construct a bilateral (country-pair) panel of 26 lender countries and 76 borrower countries between 1995 and 2012 and estimate gravity-type empirical model. We find that greater informational asymmetries, measured as less economic integration and greater geographical distance between lender and borrower countries, are associated with lower total cross-border loan activity. This finding is in line with studies of the determinants of capital flows. Banks with lower levels of capital in lender countries favor syndicated loans over other kinds of cross-border loans. Borrower country characteristics such as level of development, economic size, and capital account openness, play a lesser role for SLEs compared to non-SLEs, suggesting a diversification motive for syndications. During the global financial crisis, both SLEs and non-SLEs were higher for country pairs with lower information asymmetries.

We use two main sources to construct our data. Information on syndicated loans is available at the transaction level from Dealogic Loan Analytics. The data are highly granular as, for each loan deal, the identity of all the contracting parties and the terms of the deal are known. Availability of this data has spurred a large literature in international finance.[3] We complement this with data on cross-border bank activities from the Bank for International Settlements (BIS) international banking statistics (IBS). The BIS statistics report cross-border assets and liabilities of creditor banking systems vis-à-vis borrower countries.[4] The two data sources enable us to compare, for the first time in the literature,

[1] Due to data limitations, we are unable to further break down non-SLEs into their single-lender and intragroup activity components. See Section IV.B for details.

[2] Total deal volume fell in 2009 by more than 50 percent from its 2007 peak of 4.5 trillion U.S. dollars, on account of the 2007–2008 liquidity shocks and strained balance sheets of financial intermediaries (Brunnermeier, 2009) and a fall in credit demand (Kahle and Stulz, 2013).

[3] To give a few examples, syndicated loan data has been used to study the international transmission of financial shocks (De Haas and Van Horen, 2013) and portfolio rebalancing (Giannetti and Laeven, 2012), emerging market access to foreign capital (Hale, 2007), and the evolution of the global banking network (Hale et al., 2014; Hale, 2012). An important corporate finance literature on lender incentives in the process of syndication uses the same data or subsets of the data from other providers (see, e.g., Gopalan et al., 2011; Berndt and Gupta, 2009; Sufi, 2007).

[4] The BIS IBS have been used to study international bank flows through banking centers, financial networks, globalization, and contagion. Recent contributions include Cerutti (forthcoming), Cerutti and Claessens (2013), Kalemli-Ozcan et al. (2013), Minoiu and Reyes (2013), Cetorelli and Goldberg (2011), and Degryse et al. (2010).

syndicated and total cross-border bank loan exposures, and thus gauge the importance of international syndicated loans. This comparison, however, is not trivial. The BIS data provide banking sector exposures (stocks) at a given point in time, while syndicated loan data reflect loan origination (flows). In addition, at the point of recording the syndicated loan data comprise not only disbursed loans, but also loan commitments (credit lines) that may not be fully drawn over the life of the loan. Using data on the volume and maturity of syndicated loan deals, we estimate the stock of outstanding cross-border syndicated loans at the lender-borrower country-pair level using the same aggregation criteria as the BIS IBS. We also make several other adjustments to obtain estimates of cross-border SLEs that are comparable to the BIS loan claims.[5]

Our study expands on two branches of the international banking literature. First, we add to studies on the globalization of banking (see Goldberg, 2009 for a review) and the determinants of cross-border bank-intermediated capital flows. Blank and Buch (2010) document the drivers of cross-border bank assets and liabilities, focusing on their short-run response to macroeconomic fluctuations. They show that bank asset and liability positions are closely linked to bilateral trade, interest rate differentials, and market size. Kleimeier, Sander and Heuchemer (2013) argue that geographical and cultural proximity between European countries are key determinants of cross-border bank loans and deposits despite banking market integration. We extend this work first by estimating the distinct components of international bank loans, and second by assessing the performance of a gravity-like model in explaining their variation. Our results also speak to the behavior of banking flows during crises (Hoggarth et al., 2010; Kaminsky, 2008) as we allow the impact of different factors to change during the global financial crisis.

Second, we add to existing research on banks' decision to syndicate rather than extend bilateral loans. Godlewski and Weill (2008) study loan facilities to EME borrowers and emphasize financial development and legal institutions in the borrower's country as relevant factors. Banks are less likely to extend syndicated loans to borrowers from countries with a larger stock market and better institutions (creditor rights and rule of law), suggesting a diversification motive for syndication. Based on a sample of syndicated loan deals to US borrowers, Simons (1993) argues that loan syndications are mainly driven by lender balance sheet strength. Banks with lower capital and liquidity are likely to prefer adding smaller amounts to their balance sheets and hence are more likely to syndicate. Our empirical results, which focus on cross-border lending activity only, supports these arguments, as we find that lender balance sheets are more important for SLEs while borrower risk profiles are more relevant for non-SLEs.

The remainder of the paper is structured as follows. In Section 2 we describe the main features of the loan syndication market and provide a short historical account. In Section 3 we discuss the data sources and transformations that enable us to estimate the components of cross-border bank loan exposures. We discuss stylized facts on the composition of banks' international loan exposures in Section 4. In Section 5 we examine its drivers based on a number of empirical hypotheses. Section 6 concludes. Detailed information on data sources, transformations, and additional results are included in the Online Appendix.

2. Features and history of the syndicated loan market[6]

Loan syndications became popular in the 1970s as a source of private funding to emerging market sovereigns in Africa, Asia, and Latin America. The lenders were Western banks with excess liquidity positions from recycled petrodollars (Tucker et al., 1991). In 1982 this market was severely disrupted when EME borrowers, especially in Latin America, failed to meet payment obligations, and US banks took large losses on their syndicated credits. Eventually, the outstanding loans were restructured into bonds in part guaranteed by collateral ("Brady bonds") in 1989. This restructuring led the syndicated loan market to recover, with cross-border loan origination to private and public institutions expanding

[5] Throughout the paper we use the terms "claims" and "exposures" interchangeably.

[6] See Online Appendix Figure A1 (Panels A–L) for charts on syndicate size, borrower types, market concentration, currency composition, loan deal terms for AE vs. EME borrowers, and for domestic vs. cross-border loans.

rapidly in the following two decades, alongside the international bond market. Global syndicated loan volume increased 160 percent between 1995 and 2012 to reach 3.5 trillion U.S. dollars, positioning the market as a competitor for the bond market, which originated 6.5 trillion U.S. dollars worth of new issuances in 2012.

Syndicated loans are extended to a single borrower by a group of financial institutions called a "syndicate." Syndicates comprise banks and non-bank financial institutions and can range in size from two to dozens of participants. Syndicate participants are organized in several tiers: the so-called bookrunners are the most senior lenders. They interact with the borrower, negotiate the loan, collect participating bids from other lenders, administer payments, and receive the highest fees. Less senior participating institutions, such as mandated arrangers, interact less with the borrower and contribute smaller amounts towards the loan. The least senior syndicate members act as arms-length lenders. During 1995–2012 the average syndicate had 6.2 participants, including 2.7 lead banks (bookrunners or mandated arrangers). In terms of geographical composition of syndicates, on average during 1995–2012 syndicates had 46 percent foreign banks and 54 percent domestic banks, from the perspective of the borrower, and close to 60 percent of all syndicated loan deals had at least one foreign participant.

Most loan deals are denominated in U.S. dollars (with the euro and the yen also accounting for a significant share) and are priced over LIBOR. Syndicated loans tend to be large and of longer term than other loans. The average loan extended at the peak of the market in 2007 amounted to almost half a billion U.S. dollars but loan size decreased during the global financial crisis, especially to AE borrowers. Average loan deal maturity during 1995–2012 was 4.7 years. This means that syndicated loans have longer maturity than bilateral cross-border loans, for which we estimate an average maturity of 3.1 years, as well as relative to all loans on the balance sheet of banks in AEs, for which we estimate an average maturity of 3 years.[7]

Close to 90 percent of total deal volume accrues to AE borrowers. The average deal with EME borrowers is typically half the size of that with AE borrowers. The borrowers in this market tend to be large and creditworthy firms[8]: roughly 75 percent of loans go to non-financial firms, 15 percent to financial firms, and 10 percent to sovereigns and public sector entities. The borrower base for the syndicated loan market is becoming less concentrated. The total market share of the top 100 borrowers has declined since the mid-1990s from about 45 percent to about 25 percent in 2012—the same figure as in the international bond market. However, the syndicated loan market has historically been more concentrated than the bond market. Loan spreads were hovering around 150-200 basis points over LIBOR before the global financial crisis, and were similar for AE and EME borrowers.[9] Spreads doubled at the height of the crisis, when loan origination collapsed. Although EME borrowers have historically obtained longer-term loans than AE borrowers, this gap appears to have increased during the crisis.

Loan syndication is an important source of underwriting revenue for global banks, which compete for market share and a leading spot in Dealogic's League Tables. In 2012, the top five global underwriters, by market share, were JP Morgan, Bank of America Merrill Lynch, Citigroup, Mizuho Financial Group, and Wells Fargo & Co. Most of the loan origination activity is carried out by banks headquartered in AEs. There are significant reputational costs associated with the loan syndication business: although defaults in the syndicated loan market are rare, they can impact the lead bank's

[7] The Fig. 3.1 and 3 years are upper bound estimates computed as follows. For the first one we use BIS consolidated claims of reporting banks on an immediate borrower basis, with the caveat that these claims also include some foreign currency-denominated local claims (that is, non-cross border loans). Weighted average maturity is computed conservatively by assuming maturity of 1 year for the "up to 1 year interval", 2 years for "1–2 years," and 7 years for "> 2 years". For the second estimate, we obtain loan maturity information for 425 banks in 2012 from SNL Financial database. For these banks, 30 percent of loans have maturity of <1 year, 36 percent have maturity 1–5 years, and the remaining 34 percent have maturity >5 years. We also compute the average maturity by assuming the upper bound for each interval, and 7 years for "> 5 years".

[8] In a sample of syndicated loans from Loan Pricing Corporation, between 1986 and 2001 two thirds of non-financial US firms borrowing from syndicates had investment grade rating, while for other large loans less than half had investment grade rating (Hale and Santos, 2008).

[9] We caution that pricing information is missing for many loans in our sample, possibly in a non-random way.

reputation and future ability to place a syndicated loan (Gopalan et al., 2011; Pichler and Wilhelm, 2001). To mitigate agency concerns, lead banks tend to hold greater portions of the loans on their books as a signal of loan screening and monitoring (Sufi, 2007; Lee and Mullineaux, 2004).

Although syndicated loans are typically held to maturity, they can be sold in an active secondary market.[10] The presence of this market means that banks could treat syndicated loans as an originate-to-distribute type transaction, much like loans that end up securitized. In theory this can reduce lenders' incentives to do due diligence (Keys et al., 2010). Empirical evidence, however, suggests that this may not be the case because lead banks still face reputational costs even if they fully remove the loans from their balance sheets. Bushman and Wittenberg-Moerman (2009) show that borrowers of syndicated loans that are traded on the secondary market do not perform worse than those of non-traded loans. Benmelech, Dlugosz, and Ivashina (2012) examine loan holdings for collateralized loan obligations and show that, for each originating bank, securitized syndicated loans do not underperform unsecuritized ones. The authors argue that this is unique to syndicated loans, likely because their structure works towards aligning lender incentives.

3. Data

Our main data sources are Dealogic Loan Analytics for syndicated loans and the BIS IBS for cross-border bank claims. From Loan Analytics we downloaded more than 150,000 syndicated loan deals extended between 1990 and 2012 to estimate syndicated loan exposures at the country-pair level during 1995–2012.[11] For loan deals we have in principle detailed information on lender and borrower identity as well as contract characteristics such as loan type (credit line, term loan), size, maturity, pricing, and currency. For purposes of our analysis, we follow the literature and split loan volumes equally across syndicate participants to obtain lender-specific loan amounts and exposures (see Giannetti and Laeven, 2012; Hale, 2012).[12]

The second dataset, the BIS IBS, provides a comprehensive picture of total cross-border bank claims, and is organized in two datasets—locational and consolidated banking statistics. These data capture exposures (i.e., loans, securities, and other claims) of the most important lender countries vis-à-vis their borrowers worldwide. It is important to note that BIS banking statistics comprise only the claims of banking systems in lender countries. Consolidated data track banks' gross claims and other exposures (with intragroup positions being netted out and consolidated across offices worldwide), while locational data are residence-based, that is, they track the exposures of banks located in a particular country.[13]

Our goal is to construct cross-border syndicated loan claims that are comparable to BIS cross-border loan claims, allowing us to gauge the size of the loan syndication market. We start by constructing cross-border syndicated loan exposures (stocks) for each lender vis-à-vis each borrower using loan volumes and maturity. We then aggregate these exposures at the country-pair level aggregating on both a consolidated and locational basis using information on the location of the lender and borrower, and the nationality of the lender's parent.

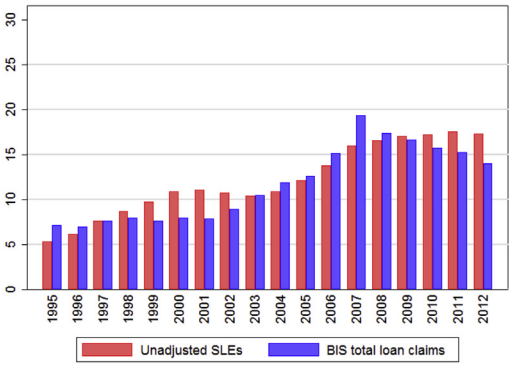
Most of our analysis focuses on the locational aggregation because the BIS locational data has longer time series coverage than consolidated data. Nevertheless, we also make use of the consolidated data to estimate the on-balance sheet share of syndicated credit lines, which is a crucial step in making SLEs comparable to BIS loan claims.

[10] Empirical studies show that the secondary market for syndicated loans is efficient in terms of incorporating borrower information into prices, e.g., default and bankruptcy information (Altman et al., 2010) and earnings (Allen et al., 2008).

[11] We limit our period of analysis to 1995–2012 for two reasons. First, Loan Analytics data on syndicated loan origination before 1990 is of lower quality than post-1990 data, therefore we have more confidence in post-1995 estimated SLEs. Second, this ensures maximum availability of data on key country characteristics.

[12] This imputation is needed because lender-specific loan shares are missing for a large proportion of loans. In the Online Appendix we show that the approach of splitting loan deal amounts equally across lenders produces estimates of loan exposures at the country pair-level (our unit of analysis) that are similar to those of other approaches proposed in the literature (see Online Appendix Table A1).

[13] See Online Appendix for further information on both data sources.



Notes: The figure depicts unadjusted SLEs vs. BIS loan claims during 1995–2012. All figures are expressed in trillions of constant U.S. dollars (2005 prices).

Fig. 1. Syndicated vs. total loan exposures (trillions of U.S. dollars). Sources: Dealogic Loan Analytics, BIS locational banking statistics.

4. The syndicated loan market and total cross-border bank lending activity

4.1. Constructing syndicated loan exposures

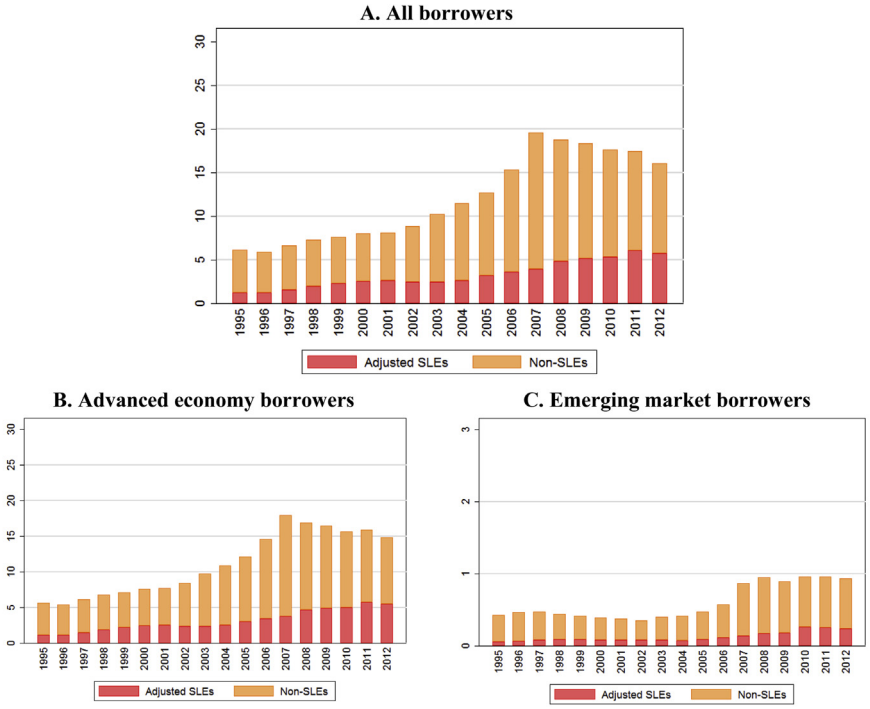
We begin with a preliminary comparison of total cross-border loan claims on a locational basis from the BIS with our estimated SLEs. Fig. 1 depicts this comparison over the period from 1995 to 2012, with both variables expressed in trillions of constant U.S. dollars (2005 prices). Between 1995 and 2007, total cross-border loan claims rose three-fold, reflecting an increase in financial integration. Estimated SLEs increased over the same period by a comparable amount. However, there was a significant decrease in total bank loan claims during the global financial crisis (by about 5 trillion U.S. dollars from their 2007 peak to 2012) while SLEs did not experience the same decrease over the period.

More strikingly, Fig. 1 shows that our estimated SLEs exceed total cross-border loan claims from the BIS for about half of the time. There are two explanations for this. First, some participants in the loan syndication market are non-bank institutional investors (asset managers, hedge funds, private equity funds, etc.), while the BIS IBS only capture banks' positions. Second, syndicated loan deals often involve credit lines that are not fully drawn over the life of the loan. For these reasons, the SLEs computed thus far overstate the size of the market.

To make the two series comparable, we perform two adjustments, both of which we believe deliver better estimates of SLEs.[14] First, syndicated loans that are reported as either credit lines or "Term Loan A"-type term loans are extended almost exclusively by banks (Culp, 2013; Benmelech et al., 2012; Nandy and Shao, 2010; Nini, 2008). While the syndicates of other deals (mainly term loans not classified as Term Loan A) may also include banks, it is difficult to identify them precisely and separate banks from non-bank institutional lenders for each deal. For this reason, we adjust the SLEs to only refer to credit lines and term loans of type A.

The second adjustment deals with the fact that the credit lines reported in Loan Analytics include both on-balance sheet, drawn amounts, and off-balance sheet, undrawn amounts. To obtain an estimate of the drawn amounts that are relevant in the comparison with the BIS loan claims (which only capture on-balance sheet positions), we need information on credit line utilization. To obtain credit line usage rates, for each borrower and year, we compare syndicated

[14] See Online Appendix for a detailed description of these adjustments.



Notes: The figure depicts adjusted SLEs vs. non-SLEs (computed as the difference between BIS total loan claims and adjusted SLEs) during 1995–2012 for all borrowing countries (A), advanced economy borrowers (B), and emerging market borrowers (C). SLEs are adjusted for maximum comparability with the BIS loan claims (see text for details). All figures are expressed in trillions of constant U.S. dollars (2005 prices).

Fig. 2. Syndicated vs. non-syndicated loan exposures (trillions of U.S. dollars). Sources: Dealogic Loan Analytics, BIS locational banking statistics, and authors' calculations.

credit line exposures aggregated on a consolidated basis with undrawn credit lines from the BIS consolidated banking statistics (available for a limited number of lender countries from 2005 onwards).[15]

Our estimated credit line usage rates rose from approximately 25 percent before the global financial crisis to 40 percent by 2009 and further to 57 percent by 2011 at the height of the European sovereign debt crisis. These estimates are consistent with evidence for the US that credit line utilization varies over the business cycle. Mian and Santos (2012) report that credit line utilization rose by about 17 percentage points for US firms when credit conditions were tight. Ivashina and Scharfstein (2010) and Berrospide and Meisenzahl (2013) document significant credit line drawdowns by US firms as the subprime crisis gathered pace. Correa, Sapriza, and Zlate (2013) document a usage ratio of about one third for US branches of foreign banks in 2010. While these estimates are not directly comparable to ours due to differences in data and methodology, we are reassured that the trend we uncovered is consistent with that documented in the literature. We use the credit line utilization rates to adjust the

[15] See Online Appendix for more details and Table A2 for credit line usage rate estimates.

credit line component of SLEs downwards and hence to obtain "adjusted SLEs" that are comparable to the BIS loan claims.

4.2. The composition of cross-border bank loan exposures

Fig. 2 breaks out the BIS total cross-border loan claims into the adjusted SLEs and non-SLEs (a residual obtained as the difference between BIS loan claims and adjusted SLEs). Panel A includes all borrowers, while panels B and C are for AE and EME borrowers, respectively. From 1995 to 2012 the share of syndicated lending in total loan claims fluctuated between 17 and 41 percent in the full sample, between 19 and 47 for AE borrowers and between 10 and 27 percent for EME borrowers. Over time, the relative importance of the syndicated loan market has grown.[16]

Although loan volumes to EMEs are significantly lower than those to AEs, syndicated loans are still a significant source of funding for both AE and EME borrowers.[17] They are also consistent with other estimates. Ivashina and Scharfstein (2010) report that SLEs represent about 20 percent of total commercial and industrial loan exposures of US banks and about 30 percent for large US and foreign banks. According to a survey of 50 US banks representative of the banking sector size distribution, Huang (2010) finds that SLEs account for less than 5 percent of commercial and industrial loan claims for one fourth of banks, 5–20 percent for half of the banks, and 20–50 percent for one fifth of the surveyed banks.

Fig. 2 also reveals a steep increase in BIS total loan claims in the run-up to the global financial crisis for both AE and EME borrowers, followed by a reduction in exposures to AE borrowers during the crisis that is consistent with the deleveraging process described in Cerutti and Claessens (2013) and Milesi-Ferretti and Tille (2011). Unlike total exposures, however, we notice that SLEs *increased* during the crisis. There are two explanations for this increase. First, as mentioned, drawdowns on existing syndicated credit lines increased markedly during the crisis. Second, maturities for most syndicated loans lengthened during the credit boom prior to the crisis. Average maturity of loan deals increased from 3.8 years in 2002 to 5.3 years in 2007, leading fewer loans to mature during the crisis. These two factors combined induced stickiness in the dynamics of SLEs.

What do we know about the residual component of cross-border loan claims, which is generated through other kinds of cross-border loans? Non-SLEs refer to bilateral and intragroup loans. The BIS IBS do not distinguish between these components. However, we can use the BIS locational statistics to obtain a rough idea of the composition of non-SLEs. In particular, we look at the breakdown of banks' international positions into assets vis-à-vis related offices (which are indicative of the contribution of intragroup lending), and vis-à-vis unrelated banks, non-banks, and official monetary authorities. We find that intragroup loans account for 28.8 percent of total claims.

Using our adjusted SLEs, the estimated contribution of intragroup lending to banks' international positions, and the residual (i.e., the contribution of bilateral loans), we are now able to fully describe the composition of cross-border bank lending from 1995 to 2012. As a rough estimate for the whole period, these components contribute to total cross-border loan exposures about one third each.[18]

[16] SLEs and BIS total loan claims co-move significantly, which suggests that SLEs can be a useful proxy for cross-border bank lending activity when BIS data are unavailable. When we regress BIS total loan claims on (unadjusted) SLEs, we find that about 50 percent of the variation in total exposures is explained by variation in SLEs. Country-pair and year fixed effects explain an additional 25 percent of the total variation (Online Appendix Table B1). These findings, about stocks, complement an earlier result that about 50 percent of the variance in international bank lending to EME borrowers is explained by changes in syndicated loan volumes (Gadanecz and von Kleist, 2002). This degree of co-movement suggests that developments in the syndicated loan market can provide useful information about global bank lending activity before BIS statistics are released.

[17] Nevertheless, there is significant heterogeneity in the share of SLEs in total loan positions across lender and borrower countries (Online Appendix Figure B1). The median share during 1995–2012 varies from almost zero for the Cayman Islands, Cyprus, and Panama to over 20 percent for Australia, Japan, and South Africa. SLEs are zero for offshore financial centers as loan origination in these jurisdictions is mainly carried out by non-bank institutional lenders (Aramonte et al., 2014).

[18] See Online Appendix Figures A3 and A4.

5. Drivers of cross-border bank lending activity

5.1. Hypotheses and variables

In this section we investigate the factors driving the composition of cross-border bank loan claims, focusing on a comparison of the determinants of SLEs and non-SLEs, in a gravity-type empirical model. Our analysis draws on studies of the determinants of cross-border capital flows (Bruno and Shin, 2013; Lane and Milesi-Ferretti, 2008; Portes and Rey, 2005) and of banks' decisions to syndicate or extend bilateral loans (Altunbas et al., 2006). The baseline set of covariates for SLEs and non-SLEs includes country-pair, lender, and borrower characteristics.

Our starting point is based on observations regarding the main push–pull and gravity-type drivers of cross border capital flows. For each set of potential covariates, we discuss the differences and similarities between syndicated loans and other types of cross-border loans. In developing the hypotheses and interpreting the results, we are mindful that non-SLEs reflect two types of loans—bilateral and intragroup loans—and hence determinants of each type of loan may operate in opposite directions to influence the non-SLE aggregate.

Observation 1: greater information asymmetries reduce cross-border bank lending. To test this idea, we include several variables that capture economic, cultural, and geographic distance between the lender and the borrower country as measures of the information and monitoring costs involved in cross-border lending activity between the two countries. Our proxies include bilateral trade, geographical distance, and an indicator for the countries speaking a common language. Giannetti and Yafeh (2012) highlight the importance of cultural differences between lead banks and borrowers for the terms of syndicated loans and show that these differences do not vanish even after repeated interactions between the contracting parties. We expect that information asymmetries will play a role for both syndicated and non-syndicated loan exposures. However, it is possible that they are reduced through the process of syndication because most syndicates include domestic banks, which are more likely to have local knowledge of the borrower.[19] We also expect that information asymmetries play a greater role during times of financial stress.

Observation 2: balance sheet constraints and size of lender banks influence their ability to intermediate cross-border credit. The ability of a banking system to intermediate credit across borders is closely linked to its level of development and sophistication, the strength of bank balance sheets, and regulation. Balance sheets of financial intermediaries are a key channel of shock transmission (Bruno and Shin, 2013; Cetorelli and Goldberg, 2012; Adrian and Shin, 2011; Van Rijckeghem and Weder, 2003). But which constraints will matter more for SLEs compared to non-SLEs? Syndicated loans help banks reduce exposures to individual borrowers, which enable them to manage concentration risk and satisfy regulatory limits on concentration. When capital and liquidity constraints are more binding, banks may prefer to syndicate rather than to add large bilateral loans to their balance sheets (Simons, 1993). By contrast, banks that are larger and more profitable may be better able to invest the necessary resources to acquire borrower knowledge and extend loans bilaterally (Altunbas et al., 2006). In line with studies of the role of capital in sustaining lending to the real economy after the failure of Lehman Brothers (Kapan and Minoiu, 2013), we expect capital constraints to become more binding during the global financial crisis. To capture these ideas, we include in our analysis lender country characteristics such as per capita income level and size of the banking system as proxies for the lender country's capacity to extend cross-border credit and banking system sophistication. Our main proxy for lender capital will be the bank total regulatory capital-to-asset ratio. Banking system regulation is a slowly-moving variable and is controlled for with lender country fixed effects. To capture bank balance sheet strength and profitability we also look at the impact of net interest margins, returns on assets, and non-performing assets on loan exposures. The measure of lender size is total banking system assets.

Observation 3: borrower country risk characteristics affect the willingness of lenders to extend cross-border credit and the ability of borrowers to access it. Another reason why banks choose to syndicate

[19] In 2012, 86 percent of loan deals were extended by syndicates with at least one domestic bank.

Table 1
List of countries in the sample.

Creditor banking system countries	Debtor countries		
Advanced economies	*Advanced economies*	*Emerging market economies*	
Australia	Australia	Albania	Peru
Austria	Austria	Argentina	Philippines
Belgium	Belgium	Belarus	Poland
Canada	Canada	Brazil	Russia
Denmark	Czech Republic	Bulgaria	South Africa
Finland	Denmark	Chile	Sri Lanka
France	Estonia	China	Thailand
Germany	Finland	Colombia	Tunisia
Greece	France	Costa Rica	Turkey
Ireland	Germany	Croatia	Ukraine
Italy	Greece	Ecuador	Uruguay
Japan	Ireland	Egypt	Venezuela, Rep. Bol.
Luxembourg	Israel	El Salvador	Vietnam
Netherlands	Italy	Guatemala	
Portugal	Japan	Hungary	
Spain	Luxembourg	India	
Sweden	Netherlands	Indonesia	
Switzerland	New Zealand	Jamaica	
United Kingdom	Norway	Jordan	
United States	Portugal	Kazakhstan	
	Singapore	Latvia	
Emerging market economies	Slovak Republic	Lebanon	
Brazil	Slovenia	Lithuania	
Chile	South Korea	Malaysia	
India	Spain	Mexico	
Mexico	Sweden	Morocco	
Panama	Switzerland	Pakistan	
Turkey	United Kingdom	Panama	

Notes: The table lists the 26 creditor banking system (lender) countries and 76 debtor (borrower) countries in our baseline regression sample. Countries are classified as advanced or emerging market economies according to the IMF's World Economic Outlook (September 2013).

loans is portfolio diversification. Syndication offers the possibility to benefit from the lead bank's knowledge of the borrower and expertise lending to a given market; by contrast, bilateral lending requires costly market research and relationship-building. Borrower country risk characteristics that are generally relevant in a bank's decision to extend cross-border loans should reflect external and domestic vulnerabilities, and may include solvency, liquidity, and financial openness. Since syndicated loans allow banks to diversify risks by lending to a wide range of borrowers, including riskier ones, we expect the borrower risk profile to be less relevant for SLEs compared to non-SLEs. We consider borrower country variables such as per capita income (as a proxy for both the demand for cross-border loans as well as the ability of the domestic financial sector to meet that demand), size of the domestic banking system (as a proxy for its capacity to meet local demand and co-syndicate with global banks), institutional quality (as a measure of contract enforcement), and capital account openness (as a broad measure of barriers to foreign bank entry and foreign competition, and government influence on financial services).

5.2. Regression specification

We investigate how differences between syndicated loan deals and other types of cross-border loans translate into drivers of SLEs and non-SLEs using our bilateral dataset for the 1995–2012 period. We estimate regressions which take the form:

$$\log(SLE_{ijt}) = \alpha_i + \delta_j + \lambda_t + X_{it}\beta_1 + Y_{jt}\beta_2 + Z_{ijt}\gamma + \varepsilon_{ijt},$$

Table 2
Variable sources and definitions.

Variable	Description	Source
A. Cross-border bank exposures		
Syndicated loan exposures (SLE)	Computed from loan-level data on syndicated loan deals using information on deal amount and maturity. Expressed in constant terms using US CPI.	Authors' calculations using Dealogic Loan Analytics and IMF's INS database for US CPI.
BIS international banking statistics	Total claims of banking systems of BIS reporting countries vis-à-vis residents in other countries, aggregated on a locational or consolidated basis. See Appendix for details. Expressed in constant terms using US CPI.	BIS locational and consolidated banking statistics and IMF's INS database for US CPI.
Non-syndicated loan exposures (non-SLE)	Computed as the difference between total loan claims of baking systems of BIS reporting countries, on a locational basis, and syndicated loan exposures.	Authors' calculations.
B. Regression variables		
Within-pair		
Log-real (bilateral) trade	The sum of total exports and imports.	UN-COMTRADE
1: Common language	Indicator for same language spoken in the two countries. Available for download on: http://www.cepii.fr/anglaisgraph/bdd/distances.htm	Mayer and Zignago (2011)
Geographical distance	Distance (in km) between the capital cities of the two countries. Available for download on: http://www.cepii.fr/anglaisgraph/bdd/distances.htm	Mayer and Zignago (2011)
1: Foreign affiliate	Indicator for the presence of bank affiliate(s) of country i in host country j in at least one quarter of each year. Constructed using affiliates' claims data for country pairs i-j in the BIS consolidated statistics (both immediate risk and ultimate risk basis).	Authors' calculations using BIS consolidated banking statistics.
Country characteristics		
Bank assets (% GDP)	Total assets held by deposit money banks as a share of GDP. Assets include claims on domestic real nonfinancial sector which includes central, state and local governments, nonfinancial public enterprises and private sector. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits.	Global Financial Development Database (World Bank, 2013), April.
Bank capital-to-assets ratio	Ratio of bank capital and reserves to total assets. Capital and reserves include funds contributed by owners, retained earnings, general and special reserves, provisions, and valuation adjustments. Capital includes tier 1 capital and total regulatory capital. Total assets include all nonfinancial and financial assets.	Global Financial Development Database (World Bank, 2013), April.
Capital account openness	Degree of openness of the capital account, on a scale from 0 to 100. Higher values represent greater openness	Quinn et al. (2011)
Exchange rate volatility	Computed as the yearly standard deviation of monthly nominal exchange rates.	IMF's International Financial Statistics (IFS)
Institutional quality	Polity IV score on a scale from −10 (autocracy) to +10 (democracy). Available for download on: http://www.systemicpeace.org/inscrdata.html	Polity IV project: Political Regime Characteristics and Transitions, 1800−2008.Polity IV project: Political Regime Characteristics and Transitions, 1800−2008.
Internationally-rated banks (%)	Percentage of domestic banks that are rated by one of the three leading credit rating agencies (Moody's, Standard & Poor's, or Fitch).	Global Financial Development Database (World Bank, 2013), April.
Liquid assets	The ratio of the value of liquid assets (easily converted to cash) to short-term funding plus total deposits. Liquid assets include cash and due from banks, trading securities and at fair value through income, loans and advances to banks, reverse repos and cash collaterals. Deposits and short term funding includes total customer deposits (current, savings and term) and short term borrowing (money market instruments, CDs and other deposits).	Bankscope

Table 2 (*continued*)

Variable	Description	Source
Loan loss reserves (% gross loans)	Valuation reserves against a bank's total loans on the balance sheet, representing the amount the banks thinks is adequate to cover estimated losses in the loan portfolio. Computed as percentage of gross loans outstanding minus earned income and loan loss reserves for charged-off loans.	Bankscope
Net charge-offs (% gross loans)	Gross amount of loans charged off as bad debt minus recoveries collected from earlier charge-offs.	Bankscope
Net interest margin	Accounting value of bank's net interest revenue as a share of its average interest-bearing (total earning) assets.	Bankscope
Per capita income	Per capita GDP (computed as RGDPE/POP)	Penn World Tables 8.0
Return on assets	Commercial banks' net income to yearly averaged total assets.	Bankscope
S&P sovereign credit rating	Soveregin credit rating by Standard & Poor's at end-year.	Standard & Poor's
Stock market capitalization (% GDP)	Total value of all listed shares in a stock market as a percentage of GDP.	Global Financial Development Database (World Bank, 2013), April.
Stock market return volatility	Volatility of stock market returns is the x-year standard deviation of the return on the S&P/IFCG (RI) index. Detailed description of the index: http://www.russell.com/us/glossary/indexes/s&p_ifc_emerging_markets_indexes.htm.	Datastream Advance

where α_i and δ_j are lender and borrower country fixed effects, λ_t are year fixed effects, X_{it} is a set of lender country time-varying characteristics, Y_{jt} is a set of borrower country time-varying characteristics, Z_{ijt} comprises time-varying country pair-level variables, and ε_{ijt} are well-behaved errors. We use the same specifications for non-SLEs:

$$\log(non - SLE_{ijt}) = \alpha_i' + \delta_j' + \lambda_t' + X_{it}\beta_1' + Y_{jt}\beta_2' + Z_{ijt}\gamma' + \xi_{ijt}$$

Lender and borrower countries are indexed by *i* and *j*, respectively. Our regression sample includes 26 lender countries and 76 borrower countries (listed in Table 1). We perform the analysis on country-pairs with non-zero cross-border syndicated loan activity (unbalanced panel). Descriptions and sources for the regression variables are included in Table 2 and summary statistics are show in Table 3.[20] All coefficients are estimated using Ordinary Least Squares (OLS) and standard errors are clustered on country pair.

In addition to the country characteristics discussed in the previous section, we include the following control variables in all regressions:

- *An indicator for presence of foreign affiliates of lender country i in borrower country j*. This variable captures the mechanical effect that presence of foreign affiliates has on the intragroup lending component of non-SLEs. It may also capture the fact that global banks sometimes co-syndicate loans with their affiliates in the borrower's country.
- *Total other lending* (*log*) and *total other borrowing* (*log*): For lender country *i*, "total other lending" is the sum of loan exposures to borrowers other than *j* at time *t*. Similarly, for borrower country *j*, "total other borrowing" is the sum of loan liabilities vis-à-vis lender countries other than *i* at time *t*. These variables control for heterogeneity in borrower and lender dynamics.

[20] Online Appendix Table B2 reports unconditional correlations between the dependent variables and selected regressors.

Table 3
Descriptive statistics.

	Obs.	Mean	St. Dev.	Min	P25	P50	P75	Max
A. Cross-border bank exposures								
BIS claims (total)	9213	4331.40	4331.40	0.92	168.50	762.88	3081.97	149440.35
BIS claims (loans)	9213	17088.12	17088.12	0.90	346.30	1913.31	9699.00	1035620.00
SLE (total, unadjusted)	9213	12678.98	12678.98	0.90	250.88	1275.82	6333.66	1032253.90
SLE (total, adjusted)	9213	1134.77	1134.77	0.03	17.12	102.97	628.61	60363.54
SLE (credit lines, adjusted)	9213	954.00	954.00	0.00	5.66	72.56	522.69	55141.15
SLE (term loans, adjusted)	9213	180.77	180.77	0.00	0.00	4.19	54.56	13179.62
B. Regression variables								
Within-pair								
Log-SLE	9213	3.44	1.93	0.08	1.95	3.14	4.76	9.58
Log-non-SLE	9213	5.86	2.41	0.00	4.04	5.92	7.55	12.41
Log-real (bilateral) trade	9213	7.06	2.26	0.00	5.90	7.35	8.56	12.77
1: Common language	9213	0.13	0.34	0.00	0.00	0.00	–	1.00
Log-geographical distance	9213	8.18	1.08	4.09	7.33	8.40	9.11	9.88
1: Foreign affiliate	9213	0.39	0.49	0.00	0.00	0.00	–	1.00
Lender characteristics								
Log-per capita GDP	9213	9.90	0.63	7.65	9.74	10.09	10.22	10.73
Bank assets (% GDP)	9213	89.97	46.85	26.28	58.40	85.49	106.35	245.07
Bank capital-to-asset ratio	9213	6.33	2.39	2.40	4.90	6.00	7.00	13.40
Net interest margin	8464	4.90	3.39	2.13	2.34	3.88	5.23	11.19
Liquid assets (% deposits and ST funding)	8464	43.60	21.22	13.80	27.51	38.22	56.76	78.30
Return on assets	8464	1.11	0.97	−0.09	0.40	1.09	1.45	3.37
Loan loss reserves (% gross loans)	8363	3.80	2.40	1.39	2.31	2.91	5.47	8.90
Net charge-offs (% gross loans)	7185	1.14	0.79	0.20	0.34	1.09	1.67	2.55
Borrower characteristics								
Log-per capita GDP	9213	9.42	0.86	6.90	8.77	9.45	10.19	11.27
Bank assets (% GDP)	9213	74.33	47.30	4.93	31.67	69.79	104.73	187.44
Institutional quality	9213	5.92	6.11	−10.00	6.00	9.00	10.00	10.00
Capital account openness	9213	77.96	25.48	25.00	50.00	87.50	100.00	100.00
Exchange rate volatilty	6654	7.15	23.27	0.00	0.02	0.16	1.49	141.15
Stock market capitalization (% GDP)	9000	58.44	51.78	0.62	22.11	40.22	80.68	238.91
Stock market return volatility	3042	184.98	358.91	6.28	31.90	74.85	199.75	1617.70
S&P Sovereign credit rating	8801	19.76	14.67	1.00	3.00	19.00	30.00	60.00
% internationally-rated banks	7549	68.10	32.42	0.00	50.00	80.00	100.00	100.00

Notes: The table reports summary statistics for selected variables used in the empirical analysis. The summary statistics are computed for the regression sample (corresponding to column 1 in Table 4). All aggregates in Panel A are expressed in millions of constant U.S. dollars (2005 prices). See Table 2 for variable definitions and sources.

In subsequent specifications, we add interaction terms between a global financial crisis dummy (for the years from 2008 to 2012) and selected covariates. We add country fixed effects in all baseline specifications, and alternatively country-pair fixed effects in the robustness section to control for time-invariant gravity-type characteristics. Unless otherwise specified, all regressions include year fixed effects which capture the impact of global variables such as uncertainty and risk aversion. In the robustness section we also present specifications that control for a wider range of pair- and country-level characteristics than considered in the baseline and assess the sensitivity of our results to alternative methodological choices.

5.3. Empirical results

5.3.1. Baseline

Table 4 presents our baseline results for the two dependent variables: SLEs (columns 1–3) and non-SLEs (columns 4–6). Our aim in these specifications is to explore the correlates of different types of cross-border loan exposures as opposed to identifying their fundamental determinants. For this reason, we caution that these results should not be interpreted causally.

The estimates in columns 1–3 of Table 4 show that higher volume of trade between lender and borrower countries, lower geographical distance between the capitals of the two countries, and sharing

Table 4
Drivers of syndicated and non-syndicated loan exposures - Baseline.

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Log-SLE			Dependent variable: Log-non-SLE		
	Full	AE borrowers	EME borrowers	Full	AE borrowers	EME borrowers
Within-pair						
Log-real trade	0.241***	0.203***	0.229***	0.256***	0.159***	0.433***
	(0.030)	(0.034)	(0.070)	(0.039)	(0.038)	(0.069)
1: Common language	0.305***	0.196* (0.112)	0.541***	0.161 (0.109)	0.058 (0.145)	0.612***
	(0.100)		(0.186)			(0.155)
Log-geographical distance	−0.405***	−0.553***	−0.509***	−0.777***	−0.876***	−0.854***
	(0.057)	(0.079)	(0.136)	(0.065)	(0.086)	(0.121)
1: Foreign affiliate	0.525***	0.405***	0.465***	0.753***	0.744***	0.582***
	(0.062)	(0.078)	(0.097)	(0.068)	(0.098)	(0.089)
Lender characteristics						
Log-per capita GDP	−0.452 (0.324)	−0.247 (0.450)	−0.550 (0.474)	0.079 (0.330)	0.407 (0.398)	−0.359 (0.516)
Bank assets (% GDP)	−0.000 (0.001)	−0.000 (0.001)	0.000 (0.001)	−0.000 (0.001)	−0.001 (0.001)	0.002* (0.001)
Bank capital-to-assets ratio	−0.049***	−0.055***	−0.048**	−0.010 (0.018)	0.016 (0.023)	0.049* (0.025)
	(0.015)	(0.020)	(0.022)			
Log-total other lending	0.617***	0.651***	0.592***	0.034 (0.041)	−0.128**	0.181***
	(0.030)	(0.055)	(0.037)		(0.060)	(0.045)
Borrower characteristics						
Log-per capita GDP	−0.105 (0.197)	−0.852*	−0.052 (0.296)	0.704***	1.719***	0.080 (0.280)
		(0.472)		(0.192)	(0.578)	
Bank assets (% GDP)	0.002** (0.001)	0.001 (0.001)	0.003 (0.002)	0.006***	0.004***	0.008***
				(0.001)	(0.001)	(0.002)
Institutional quality	0.009 (0.012)	0.006 (0.065)	0.025** (0.011)	0.005 (0.012)	0.135 (0.086)	0.013 (0.012)
Capital account openness	0.002 (0.002)	0.004 (0.005)	0.002 (0.002)	0.009***	−0.004 (0.005)	0.009***
				(0.002)		(0.002)
Log-total other borrowing	0.107***	0.193***	0.075 (0.049)	0.075 (0.067)	0.008 (0.097)	0.130 (0.091)
	(0.038)	(0.053)				
Observations	9213	4601	4200	9213	4601	4200
R-squared	0.811	0.853	0.748	0.786	0.762	0.717

Notes: The dependent variable is log-SLE (columns 1–3) and log-non-SLE (columns 4–6). Sample period: 1995–2012. All regressions include country and year fixed effects. Standard errors are clustered on country pair. See Table 2 for variable definitions and sources.

a common language, all indicating lower information asymmetries, are associated with higher SLEs. These results extend to non-SLEs, although the coefficient on "common language" remains statistically significant only for exposures to EME borrowers. These results speak to the importance of informational and monitoring costs in international lending transactions, and are consistent with the findings from gravity-type models for capital flows (Herrmann and Mihaljek, 2013; Portes and Rey, 2005). The positive and statistically significant coefficient on bilateral trade also suggests that economic and financial integration go hand in hand: a 10 percent increase in bilateral trade is associated with a 2.4–2.6 percent increase in cross-border loan exposures (columns 1, 4). Similarly, a 10 percent decrease in geographical distance brings about an increase in loan exposures by between 4 and 8 percent (columns 1, 4).

In terms of lender country characteristics, there are both similarities and differences in the drivers of SLEs and non-SLEs. The income level and the size of the lender's banking system do not influence cross-border loan exposures of either kind. By contrast, capital of lender banks seems to play an important role for SLEs: higher levels of capital (measured with the regulatory capital-to-assets ratio) are associated with lower SLEs. A 1 percentage point increase in the capital-to-assets ratio—about half a standard deviation in our sample—reduces SLEs by 4.9 percent (column 1). This finding confirms our hypothesis that lower capital levels act as an incentive for banks to syndicate large loans rather than to add them wholly to their balance sheets, and complements Simons (1993)'s result that less well capitalized lead banks tend to retain smaller shares of syndicated loans. In theory the impact of capital on lending is ambiguous, as better capitalized banks can take on larger credit risks, but weakly

Table 5
Drivers of syndicated and non-syndicated loan exposures - Interactions with indicator for global financial crisis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable: Log-SLE						Dependent variable: Log-non-SLE					
	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full
Within-pair												
Log-real trade	0.230***	0.239***	0.241***	0.241***	0.242***	0.230***	0.246***	0.253***	0.256***	0.254***	0.256***	0.245***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.038)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
1: Common language	0.303***	0.308***	0.305***	0.307***	0.304***	0.305***	0.160	0.165	0.161	0.163	0.161	0.162
	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)
Log-geographical distance	−0.392***	−0.384***	−0.405***	−0.406***	−0.404***	−0.392***	−0.765***	−0.751***	−0.777***	−0.779***	−0.777***	−0.759***
	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.058)	(0.064)	(0.066)	(0.065)	(0.065)	(0.065)	(0.065)
1: Foreign affiliate	0.523***	0.519***	0.525***	0.520***	0.523***	0.518***	0.752***	0.746***	0.753***	0.746***	0.749***	0.743***
	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.068)	(0.068)	(0.068)	(0.068)	(0.068)	(0.068)
Lender characteristics												
Log-per capita GDP	−0.250	−0.502	−0.449	−0.450	−0.458	−0.274	0.262	0.024	0.089	0.087	0.073	0.218
	(0.322)	(0.323)	(0.324)	(0.322)	(0.324)	(0.323)	(0.330)	(0.331)	(0.330)	(0.330)	(0.331)	(0.332)
Bank assets (% GDP)	0.000	−0.000	−0.000	−0.000	−0.000	0.000	0.000	−0.000	−0.000	−0.000	−0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Bank capital-to-assets ratio	−0.046***	−0.046***	−0.051***	−0.048***	−0.049***	−0.045***	−0.008	−0.007	−0.016	−0.009	−0.010	−0.011
	(0.015)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)
Log-total other lending	0.620***	0.612***	0.617***	0.610***	0.612***	0.612***	0.035	0.027	0.035	0.017	0.022	0.017
	(0.031)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.042)	(0.039)	(0.041)	(0.040)	(0.040)	(0.041)
Borrower characteristics												
Log-per capita GDP	−0.044	−0.077	−0.104	−0.002	−0.066	0.038	0.759***	0.746***	0.706***	0.855***	0.790***	0.899***
	(0.198)	(0.196)	(0.197)	(0.197)	(0.196)	(0.196)	(0.194)	(0.191)	(0.192)	(0.191)	(0.190)	(0.190)
Bank assets (% GDP)	0.001**	0.002**	0.002**	0.001*	0.002**	0.001*	0.006***	0.006***	0.006***	0.006***	0.006***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Institutional quality	0.012	0.012	0.009	0.013	0.010	0.016	0.008	0.008	0.006	0.010	0.007	0.013
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Capital account openness	0.001	0.002	0.002	0.001	0.003	0.001	0.008***	0.009***	0.009***	0.008***	0.010***	0.009***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Log-total other borrowing	0.091**	0.118***	0.105***	0.106***	0.107***	0.093**	0.049	0.091	0.060	0.071	0.072	0.044
	(0.037)	(0.039)	(0.038)	(0.038)	(0.038)	(0.038)	(0.067)	(0.068)	(0.069)	(0.067)	(0.067)	(0.070)
Interactions with GFC												
Log-real trade*GFC	0.081***					0.075***	0.074***					0.062***
	(0.019)					(0.020)	(0.019)					(0.021)
Log-geographical distance*GFC		−0.084***				−0.010		−0.105***				−0.038
		(0.030)				(0.037)		(0.031)				(0.038)
Bank capital-to-assets ratio*GFC			0.006			−0.001			0.018			0.015
			(0.016)			(0.016)			(0.019)			(0.020)

Capital account openness*GFC				0.005*** (0.002)		0.003* (0.002)				0.006*** (0.002)		0.003 (0.002)
Institutional quality*GFC					0.014 (0.011)	0.004 (0.011)					0.027*** (0.009)	0.016* (0.009)
Observations	9213	9213	9213	9213	9213	9213	9213	9213	9213	9213	9213	9213
R-squared	0.812	0.811	0.811	0.811	0.811	0.812	0.787	0.786	0.786	0.787	0.786	0.787

Notes: The dependent variable is log-SLE (columns 1–6) and log-non-SLE (columns 7–12) vis-à-vis all borrowers. Sample period: 1995–2012. Sample comprises all country-pairs. All regressions include year and country fixed effects. The effect of the global financial crisis dummy ("GFC") is subsumed in the year fixed effects. Standard errors are clustered on country pair. See Table 2 for variable definitions and sources.

capitalized banks may also cause credit creation as they have little capital at stake in the case of losses (Peydro, 2010). In our data there is no association between the degree of capitalization and non-SLEs (columns 4–6). For each dependent variable, we do not find any significant evidence that other lender characteristics play a different role for loan exposures vis-à-vis AE and EME borrowers.

Moving to borrower country characteristics, we notice several important distinctions in the link between borrower risk profile and syndicated vs. non-syndicated lending. Among the borrower characteristics considered—per capita income, banking sector size, institutional quality, and capital account openness—the only feature that appears to systematically favor syndicated lending is institutional quality (columns 1–3). (However, we will see that this result is not very robust to subsequent specifications.) Looking at a sample of syndicated and single-lender loans to EME borrowers, Godlewski and Weill (2008) argue that borrower country institutional quality is a crucial part of the decision to syndicate, and that heterogeneity in the expansion of syndicated loan across EMEs may be explained by cross-country differences in institutions rather than financial development and banking regulations. Institutional quality may matter more for syndicated than for bilateral loans because global banks tend to co-lend with local banks so as to benefit from their knowledge of the borrower and market, and institutional quality may capture the availability and the quality of those lenders (Gadanecz, 2004).

By contrast, non-SLEs are higher for borrowers from higher income countries, countries with larger banking systems, and countries with more open capital accounts—that is, likely less risky borrowers (columns 4–6). The diversification motive that favors syndicated over bilateral loans implies that banks extending bilateral loans may be less willing to serve risky borrowers because they are taking on full loans on their balance sheets, hence bearing the full credit risk. This idea is consistent with our finding that most of the borrower country risk and economic structure variables are more relevant for non-SLEs. The result that non-SLEs are larger vis-à-vis higher-income AE borrowers (column 5) could capture the lower risk associated with these borrowers and the fact that internal capital market transactions could be larger with affiliates in higher income countries. The finding that non-SLEs are larger vis-à-vis EME borrowers with higher capital account openness (columns 4, 6) speaks to the idea that financial freedom and low barriers to foreign bank activity may be a greater concern for EME borrowers.

Overall, our baseline results provide support for gravity-type models of cross-border bank assets, with R^2 in excess of 70 percent. These are comparable to the coefficients of determination documented in Portes and Rey (2005) for a parsimonious model of cross-border equity flows and indicate that our baseline covariates capture most of the variation in cross-country bank loan allocations. However, the drivers of SLEs are not necessarily the same as those of non-SLEs. Table 4 also shows that our control variables generally yield statistically significant coefficients. The presence of foreign affiliates of the lender country in the borrower country raises loan exposures of both kinds. The variables measuring total exposure of each lender and borrower generally yield positive and statistically significant coefficients.

5.3.2. Interactions with the global financial crisis

In Table 5 we explore the effect of the global financial crisis by investigating the interaction between selected drivers of cross-border bank loan claims and the crisis. Specifically, we estimate models with interaction terms between an indicator for the 2008–2012 period and, respectively, bilateral trade, geographical distance, lender bank capital ratio, borrower capital account openness, and borrower institutional quality. The effect of the global financial crisis itself is subsumed in the year fixed effects.

Looking at the interactions with measures of informational costs, we see that country pairs with higher bilateral trade and lower geographical distance had higher cross-border loan exposures during the crisis. Higher borrower capital account openness and better institutions are also associated with higher loan exposures during the crisis (although the coefficient for institutional quality is statistically significant only for non-SLEs). There is no evidence that lender capital mattered more during the crisis. When all interaction terms are added at the same time (columns 6, 12), we notice that only the effect of bilateral trade survives. The point estimates suggest that, during the crisis, country pairs with total trade flows higher by 10 percent experienced cross-border loan exposures that were higher by 2.3–2.6

percent. This result suggests that countries with stronger economic ties experienced lower information asymmetries during the recent crisis.[21]

This finding is consistent with the idea that when the need for loan screening and monitoring rises, as it does during financial crises when borrowers become riskier, economic proximity becomes more relevant for cross-border bank lending activity. It also relates to studies of the deleveraging process that took place after the collapse of Lehman Brothers. De Haas and Van Horen (2013) show that deleveraging was heterogeneous, with banks reducing loan origination more vis-à-vis borrowers from countries in which they had less lending experience, fewer domestic co-lenders, and less local presence.

The coefficient estimates on other variables are largely unaffected by the inclusion of the interaction terms. The only exception is the size of the borrower country banking system, which is now positively correlated with both types of cross-border loan exposures (but the coefficient magnitudes are lower for SLEs).[22]

5.4. Robustness analysis

We subject the analysis to several robustness checks, as follows: first, we assess the sensitivity of our results to the inclusion of country-pair fixed effects (instead of lender and borrower country fixed effects). Then, we examine richer specifications that include a lagged dependent variable to account for persistence of loan exposures. Finally, we evaluate the impact of additional lender and borrower country characteristics on cross-border loan exposures; and the stability of our results in the pre-global financial crisis period.

5.4.1. Alternative estimation approaches

The first robustness check concerns our choice to include country-level fixed effects in the baseline specifications, by which we implicitly assume that relevant country-pair time-invariant heterogeneity is unrelated to the included regressors. Here we relax this assumption by including country-pair fixed effects in the baseline model to control for time-invariant trust, historical and cultural ties, and informational frictions between the lender and borrower country that are difficult to measure. The results (Online Appendix Table B5) indicate that our baseline results are largely robust to including country-pair fixed effects. The only exceptions are the coefficients on the foreign affiliate dummy, which is highly persistent at the country-pair level (and thus largely absorbed by the pair effects) and those on the borrower institutional quality variable, which are positive across specifications, but lose statistical significance.

A related robustness check regards the choice of baseline specification. So far we have not accounted for the fact that cross-border loan exposures may be highly persistent, which would invite adding a lagged dependent variable to the covariate set. Including this variable is more demanding of the data as it requires that the regressors explain only the variation in loan exposures that is not accounted for by past loan exposures. We examine the impact of this variable in specifications estimated as follows: (i) OLS with country fixed effects, (ii) OLS with country-pair fixed effects (both for comparison purposes), and (iii) OLS with bias correction for short panels. The OLS estimates in (i) and (ii) are reliable under the assumption that the panel, which spans 16 years, is long enough for the OLS bias on all the regressors to be small (Kiviet, 1995). This assumption is relaxed in (iii), where estimates are obtained with the bias-corrected least squares dummy variable dynamic panel data estimator with

[21] These results are driven by the subsample of AE borrowers (see Online Appendix Tables B3 and B4).

[22] In results not reported, we also experimented with specifications in which we included country-specific financial crises, both for lenders and the borrowers, in levels and interacted with pair and country characteristics. We used three different proxies for financial crises: systemic banking crises dated by Laeven and Valencia (2013); growth recessions for the years when growth collapsed to less than one standard deviation below the long-run trend; and capital flow retrenchments in lender countries as well as capital flow sudden stops for borrower countries (Forbes and Warnock, 2012). We did not find any consistent results for systemic banking crises, but there was some evidence that both SLEs and non-SLEs decline during borrower growth recessions and sudden stops, and that these declines are higher relative to higher-risk borrower countries. Further, we did not find any evidence of additional effects of joint financial crises at the country-pair level.

initial Anderson-Hsiao coefficient values and bootstrapped standard errors (Bruno, 2005).[23] The disadvantage of this approach is that we cannot estimate coefficients on time-invariant bilateral variables (such as common language and geographical distance). The results (Online Appendix Table B6) reveal that the autoregressive coefficient is around 0.5, which does not indicate a high level of persistence. Furthermore, estimates for the effects of other regressors are largely robust across the three estimation methods: higher lender capital reduces SLEs, while higher borrower income, a larger banking system, and higher capital account openness increase non-SLEs. The coefficient on borrower institutional quality loses statistical significance when we add country-pair fixed effects or use the bias-corrected estimator.

5.4.2. Additional country characteristics

A possible worry about our baseline model is that it is too parsimonious, and omitted lender and borrower characteristics may play a role in driving cross-border bank loan exposures in a way that is not fully captured by our included covariates (even with country-pair fixed effects). The omission of these variables may not only lead to some erroneous conclusions, but could also prevent us from learning more about the drivers of SLEs and non-SLEs. To address this concern, we augment the baseline specifications with several lender and borrower country characteristics (largely inspired by the work of Altunbas et al., 2006). For lenders, we focus on balance sheet strength and profitability; for borrowers, on their risk profile.

First, we run regressions with a rich set of lender variables to capture balance sheet characteristics that may favor syndicated over bilateral lending. These include (i) net interest margins and return on assets; (ii) liquid assets-to-deposits ratio; (iii) loan loss reserves and net charge-offs (as proxies for banks' quality of the existing loan portfolio and their ability to absorb future losses). Net interest margins and return on assets may be inversely related to syndicated lending as more profitable banks are better able to invest resources to extend loans bilaterally; less profitable banks may also prefer bilateral loans as a way to boost their margins. The liquidity ratio should be negatively related to syndicated lending since banks with lower levels of liquidity may be hesitant to add large bilateral loans to their balance sheets and prefer adding smaller, syndicated portions instead (Simons, 1993). We expect banks with worse-quality loan portfolios and/or lower loan loss reserves to be less willing to add large credit risks to their balance sheets and thus to prefer syndications as well.

The estimation results for specifications in which we add all these variables one at a time and simultaneously (Online Appendix Table B7) suggest that the only relevant variable is loan portfolio quality (measured by net charge offs in percent of average gross loans), which is positively associated with SLEs and unrelated to non-SLEs (columns 6, 12). We notice, however, that the inclusion of this variable removes the statistical significance of the coefficient on capital (columns 5–6), which remains nonetheless negative. This suggests that the capital result for syndicated loans may be driven by the association between low capital and high write-offs on non-performing loans; or that the lower sample size reduces the precision of the estimate on capital.

Second, we examine the sensitivity of our main results to the inclusion of additional variables that reflect the borrower country's level of financial development and macroeconomic volatility. We expect these variables to be positively correlated with both types of cross-border loan exposures. According to the diversification motive for syndications, we may find borrower economic strength to be less relevant for SLEs compared to non-SLEs. The additional variables include exchange rate volatility (as a measure of external vulnerability but also of flexibility of the exchange rate regime), stock market capitalization (a measure of financial deepening), stock market return volatility, % of internationally rated banks (a proxy for the ability of the domestic banking system to meet credit demand and co-syndicate with international banks), and Standard & Poor's sovereign credit rating (a comprehensive measure of borrower solvency that reflects income level, growth, inflation, external debt, and default history).

[23] We also estimated the baseline specifications with the system GMM estimator, but found the results to be unreliable. Due to the large set of instruments (country and/or country-pair fixed effects) the estimator produces unstable coefficients with large standard errors.

The results (Online Appendix Table B8) suggest that our main findings survive the inclusion of these additional variables. Interestingly, the only factor that matters for both SLEs and non-SLEs is stock market return volatility; as expected, higher borrower stock market volatility is associated with lower cross-border loan exposures. However, we prefer not to include this variable in the baseline because the sample size drops significantly due to its limited availability. When all variables are included at the same time (columns 6, 12), we notice that the share of internationally rated banks in the borrower's banking system is positively linked to non-SLEs. This effect may be explained by the fact that internal transfers within banking groups require the presence of subsidiaries in the host country, which are more likely to be internationally rated. Alternatively, the share of internationally rated banks may reflect the level of financial sector sophistication in the borrower country.

5.4.3. Robustness to alternative time period

The last robustness check concerns the fact that our results may be driven by the global financial crisis period. To test whether this is the case, we restrict the sample to the 1995–2007 period. The results (Online Appendix Table B9) reveal that our main findings hold up in this alternate sample: high levels of bank capital in lender countries are negatively associated with SLEs (columns 1–3), and borrower country income, banking system size, and capital account openness are positively related to non-SLEs (columns 4–6). Better institutional quality in the borrower country increases syndicated loans to EME borrowers only (column 3).

6. Conclusions

In this paper we describe the composition of cross-border bank lending during 1995–2012, focusing on the contribution of the international loan syndication market. Our goal is to document the importance of this market as a source of funding to borrowers worldwide, and to examine the drivers of syndicated and non-syndicated loan exposures over the business cycle. To construct our sample, we bring together information on cross-border bank lending activities from two widely-used datasets: the BIS international banking statistics, which provide aggregate data on cross-border bank loan claims, and Dealogic Loan Analytics, which reports transaction-level data on syndicated loan deals. We perform multiple adjustments to the data to obtain estimates of cross-border syndicated loan exposures, at the country-pair-year level, that are comparable to the BIS cross-border loan claims.

We found that the share of cross-border syndicated lending ranges from 20 percent to more than 30 percent of total cross-border loan claims in the full sample. This finding is consistent with previous studies which report that approximately one third of loan exposures on the typical US bank balance sheet are syndicated credits. Ours is the first set of estimates that refer to a large international sample of lender and borrower countries. We find that cross-border syndicated loan exposures increased during the global financial crisis due to large credit line drawdowns. Syndicated loan exposures co-move significantly with total cross-border loan claims, but there is a great deal of heterogeneity in the share of syndicated loan exposures across countries and over time. This suggests that caution should be exercised in treating syndicated loan data as representative of total cross-border bank lending activities.

Our empirical analysis of the drivers of cross-border loan exposures revealed that banks with lower levels of capital favor loan syndications over other types of cross-border loans (including bilateral loans). Borrower country characteristics such as level of development, economic size, and capital account openness, play a lesser role in driving syndicated loan exposures, suggesting a diversification motive for syndication. During the global financial crisis, higher information asymmetries between the lender and borrower countries reduced cross-border loan exposures. Our results are largely robust to a battery of specification checks, such as the inclusion of country-pair fixed effects, accounting for persistence with a lagged dependent variable, and expanding the covariate set with additional lender and borrower country characteristics.

As empirical research on global banking grows, so does the use of the two datasets analyzed here. In this paper we shed light not only on the relationship between these two data sources, but also on the composition of banks' international loan portfolios, its cross-sectional characteristics and time dynamics. Evaluating the role of the syndicated loan market is just the first step towards gaining a more

complete picture of international bank lending. Future research should aim at further deconstructing aggregate bank exposures, for instance by estimating the share of intragroup lending, to which we only alluded in this paper.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.jimonfin.2014.11.013.

References

Adrian, T., Shin, H.-S., 2011. Financial intermediaries and monetary economics. In: Friedman, Benjamin, Woodford, Michael (Eds.), Handbook of Monetary Economics, pp. 601–650 (Chapter 12).
Allen, L., Guo, H., Weintrop, J., 2008. The information content of quarterly earnings in syndicated bank loan prices. Asia-Pacific J. Account. Econ. 15 (2), 91–121.
Altman, E.I., Gande, A., Saunders, A., 2010. Bank debt versus bond debt: evidence from secondary market prices. J. Money, Credit Bank. 42 (4), 755–767.
Altunbas, Y., Ganadecz, B., Kara, A., 2006. Syndicated Loans: a Hybrid of Relationship Lending and Publicly Traded Debt. In: Palgrave Macmillan Studies in Banking and Financial Institutions. Palgrave Macmillan.
Aramonte, S., Lee, S.J., Stebunovs, V., 2014. Low Interest Rates and Risk Allocation in the US Syndicated Loan Market. Paper presented at the Workshop on Systemically Important Financial Institutions: A Research Agenda, Beijing, February 24-25, 2014.
Benmelech, E., Dlugosz, J., Ivashina, V., 2012. Securitization without adverse selection: the case of CLOs. J. Financial Econ. 106 (1), 91–113.
Berndt, A., Gupta, A., 2009. Moral hazard and adverse selection in the originate-to-distribute model of bank risk. J. Monetary Econ. 56 (5), 725–743.
Berrospide, J.M., Meisenzahl, R.R., 2013. The Real Effects of Credit Line Drawdowns. Board of Governors of the Federal Reserve System, Mimeo.
Blank, S., Buch, C.M., 2010. International bank portfolios: short and long-run responses to macroeconomic conditions. Rev. Int. Econ. 18 (2), 289–306.
Brunnermeier, M., 2009. Deciphering the liquidity and credit crunch 2007–2008. J. Econ. Perspect. 23, 77–100.
Bruno, G.S.F., 2005. Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models. Econ. Lett. 87, 361–366.
Bruno, V., Shin, H., 2013. Capital Flows, Cross-border Banking, and Global Liquidity. NBER Working Paper No. 19038.
Bushman, R.M., Wittenberg-Moerman, R., 2009. Does Secondary Loan Market Trading Destroy Lenders' Incentives?. Chicago Booth Research Paper No. 09–45.
Cerutti, E., 2014. Drivers of cross-border banking exposures during the crisis. J. Bank. Finance. http://dx.doi.org/10.1016/j.jbankfin.2014.08.021 forthcoming.
Cerutti, E., Claessens, S., 2013. The Great Cross-border Bank Deleveraging: Supply Side Characteristics. Paper presented at the PSE/BdF/NYFed/CEPR Workshop on the Economics of Cross-Border Banking, Paris (December 13–14, 2013).
Cetorelli, N., Goldberg, L.S., 2011. Global banks and international shock transmission: evidence from the crisis. IMF Econ. Rev. 59, 41–76.
Cetorelli, N., Goldberg, L.S., 2012. Banking globalization and monetary transmission. J. Finance LXZ11 (5), 1811–1843.
Correa, R., Sapriza, H., Zlate, A., 2013. Liquidity Shocks, Dollar Funding Costs, and the Bank Lending Channel during the European Sovereign Crisis. International Finance Discussion Papers No. 2012-1059. Board of Governors of the Federal Reserve System.
Culp, C.L., 2013. Syndicated leveraged loans during and after the crisis and the role of the shadow banking system. J. Appl. Corp. Finance 25 (2), 63–85.
De Haas, R., Van Horen, N., 2013. Running for the exit: international bank lending during a crisis. Rev. Financial Stud. 26 (1), 244–285.
Degryse, H., Elahi, M.A., Penas, M.F., 2010. Cross-border exposures and financial contagion. Int. Rev. Finance 10, 209–240.
Forbes, K., Warnock, F., 2012. Capital flow waves: surges, stops, flight and retrenchment. J. Int. Econ. 88 (2), 235–251.
Gadanecz, G., 2004. The syndicated loan market: structure, development and implications. BIS Q. Rev. 75–89. December.
Gadanecz, G., von Kleist, K., 2002. Do syndicated credits anticipate BIS consolidated banking data? BIS Q. Rev. 65–74. March.

Giannetti, M., Laeven, L., 2012. The flight home effect: evidence from the syndicated loan market during financial crises. J. Financial Econ. 104 (1), 23–43.
Giannetti, M., Yafeh, Y., 2012. Do cultural differences between contracting parties matter? Evidence from syndicated loans. Manag. Sci. 58 (2), 365–383.
Godlewski, C.J., Weill, L., 2008. Syndicated loans in emerging markets. Emerg. Mark. Rev. 9 (3), 206–219.
Goldberg, L.S., 2009. Understanding banking sector globalization. IMF Staff Pap. 56 (1), 171–197.
Gopalan, R., Nanda, V., Yeramilli, Y., 2011. Does poor performance damage the reputation of financial intermediaries? Evidence from the loan syndication market. J. Finance 66 (6), 2083–2120.
Hale, G., 2007. Bonds or loans? the effect of macroeconomic fundamentals. J. Int. Econ. 117, 196–215.
Hale, G., 2012. Bank relationships, business cycles, and financial crises. J. Int. Econ. 88 (2), 312–325.
Hale, G., Santos, J., 2008. The decision to first enter the public bond market: the role of firm reputation, funding choices, and bank relationships. J. Bank. Finance 32 (9), 1928–1940.
Hale, G., Kapan, T., Minoiu, C., 2014. Crisis Transmission in the Global Banking Network. Paper presented at the Concluding Conference of the Macro-prudential Research (MaRs) Network of the European System of Central Banks, Frankfurt (June 23-24, 2014).
Herrmann, S., Mihaljek, D., 2013. The determinants of cross-border bank flows to emerging markets: new empirical evidence on the spread of financial crises. Econ. Trans. 21 (3), 479–508.
Hoggarth, G., Mahadeva, L., Martin, J., 2010. Understanding International Bank Capital Flows during the Recent Financial Crisis. Bank of England Financial Stability Paper No. 8.
Huang, R., 2010. How Committed Are Bank Lines of Credit? Evidence from the Subprime Mortgage Crisis. Federal Reserve Bank of Philadelphia Working Paper No. 10–25.
Kahle, K.M., Stulz, R., 2013. Access to capital, investment, and the financial crisis. J. Financial Econ. 110, 280–299.
Kalemli-Ozcan, S., Papaioannou, E., Peydro, J.-L., 2013. Financial regulation, financial globalization and the synchronization of economic activity. J. Finance 68 (3), 1179–1228.
Kaminsky, G., 2008. Crises and sudden stops: evidence from international bond and syndicated loan markets. Monetary Econ. Stud. 26, 107–130.
Kapan, T., Minoiu, C., 2013. Balance Sheet Strength and Bank Lending during the Global Financial Crisis. IMF Working Paper No. 13/102.
Keys, B.J., Mukherjee, T., Seru, A., Vig, V., 2010. Did securitization lead to lax screening? Evidence from subprime loans. Q. J. Econ. 125, 307–362.
Kiviet, J.F., 1995. On bias, inconsistency, and efficiency of various estimators in dynamic panel data models. J. Econ. 68, 53–78.
Kleimeier, S., Sander, H., Heychemer, S., 2013. Financial crises and cross-border banking: new evidence. J. Int. Money Finance 32, 884–915.
Laeven, L., Valencia, F., 2013. Systemic banking crises database. IMF Econ. Rev. 61 (2), 225–270.
Lane, P.R., Milesi-Ferretti, G.-M., 2008. The drivers of financial globalization. Am. Econ. Rev. Pap. Proc. 98 (2), 327–332.
Lee, S., Mullineaux, D., 2004. Monitoring, financial distress, and the structure of commercial lending syndicates. Financ. Manag. 33, 107–130.
Mayer, T., Zignago, S., 2011. Notes on CEPII's Distance Measures: the Geodist Database. CEPII Working Paper 2011–25.
Mian, A., Santos, J.A.C., 2012. Liquidity Risk and Maturity Management over the Credit Cycle. University of California, Berkeley, Unpublished manuscript.
Milesi-Ferretti, G.-M., Tille, C., 2011. The great retrenchment: International capital flows during the global financial crisis. Econ. Policy 26 (66), 289–346.
Minoiu, C., Reyes, J., 2013. A network analysis of global banking: 1978–2010. J. Financial Stab. 9 (2), 168–184.
Nandy, D.K., Shao, P., 2010. Institutional investment in syndicated loans. In: European Finance Association 2009 Bergen Meetings Paper.
Nini, G., 2008. How Non-banks Increased the Supply of Bank Loans: Evidence from Institutional Term Loans. mimeo, The Wharton School, University of Pennsylvania.
Peydro, J.-L., 2010. Discussion of "The effects of bank capital on lending: what do we know, and what does it mean?". Int. J. Central Bank. 6 (4), 55–69.
Pichler, P., Wilhelm, W., 2001. A theory of the syndicate: form follows function. J. Finance 50 (4), 1113–1146.
Portes, R., Rey, H., 2005. The determinants of cross-border equity flows. J. Int. Econ. 65, 269–296.
Quinn, D., Schindler, M., Toyoda, A.M., 2011. Assessing measures of financial integration and openness. IMF Econ. Rev. 59 (3), 488–523.
Simons, K., 1993. Why do banks syndicate loans? N. Engl. Econ. Rev. 45–52.
Sufi, A., 2007. Information asymmetry and financing arrangements: evidence from syndicated loans. J. Finance 62, 629–668.
Tucker, A., Madura, J., Chiang, T., 1991. International Financial Markets. West Publishing Company, St. Paul, Minnesota.
Van Rijckeghem, C., Weder, B., 2003. Spillovers through banking centers: a panel data analysis of bank flows. J. Int. Money Finance 22 (4), 483–509.
World Bank, 2013. Global Financial Development Database (GFDD). April. Available on. http://go.worldbank.org/AWACYAMMM0 (accessed 30.05.13.).