

What Drives Bank-Intermediated Trade Finance? Evidence from Cross-Country Analysis*

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Several important policy questions raised by the drop in trade finance during the global financial crisis remain unsettled due to the lack of hard data on trade finance. This paper provides fresh empirical evidence on the determinants of bank-intermediated trade finance using a novel panel data set. Results indicate that trade finance is driven by demand-side factors, such as a country's trade flows growth, and global import growth. In addition, trade finance is dependent on funding availability for domestic banks, as well as global financial conditions and dollar funding costs. These results are robust to different model specifications.

JEL Codes: F14, F19.

1. Introduction

The market for global trade finance was generally regarded as well functioning and liquid until the global financial crisis of 2008–09, and thus did not attract much attention from policymakers and scholars.

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Since the crisis, however, trade finance has experienced episodes of stress, particularly after the collapse of Lehman Brothers in September 2008 and again in late 2011, when several European banks were under funding pressures.¹ In this context, understanding the drivers of trade finance becomes important for two main reasons. First, international trade is heavily dependent on trade finance since it involves certain forms of commercial risks that are elevated relative to domestic trade, such as payment risk and transportation risk, in addition to exchange rate risk, which is unique to this line of activity. These risks are generally assumed by banks since importers and exporters are often unwilling to bear them. Indeed, estimates for the share of global trade relying on trade finance instruments range from 30 to 40 percent (Committee on the Global Financial System 2014). This paper focuses on trade finance intermediated by banks.²

Second, research has shown that shocks to banks in general and the supply of trade finance, in particular, affect exports and imports and have contributed to the drop in trade in recent years (Ahn 2013; Amiti and Weinstein 2011; Del Prete and Federico 2014; Niepmann and Schmidt-Eisenlohr 2017; Paravisini et al. 2011). The importance of trade finance in supporting the functioning of global trade is also underscored by the fact that many multilateral and national institutions expanded their trade finance programs to facilitate exports and imports in some emerging market and advanced economies following the call from leaders of the Group of Twenty (G-20) countries in the aftermath of the global financial crisis.³

¹Broadly speaking, the term “trade finance” refers to payment arrangements between buyers and sellers. The focus of this paper is on the international dimension of trade finance, i.e., financing for cross-border transactions.

²Trade finance includes both bank-intermediated trade finance, in which banks facilitate transactions between buyers and sellers, and non-bank trade finance, in which buyers and sellers extend credit to each other; this paper focuses on the first category only. Estimates for the share of global trade finance relying on different financing options, including open accounts, interfirm trade credit, and bank-intermediated trade finance, are much higher, in the range of 80 to 90 percent (Auboin 2009). However, global estimates should be treated with caution, as gauging the overall size of the bank-intermediated trade finance market requires extrapolation from partial data, which makes these estimates imprecise.

³For a detailed discussion, see Asmundson et al. (2011) and CGFS (2014). The G-20 communiqués, including the communiqué from the April 2009 summit, can be found at http://www.g20.utoronto.ca/2009/2009communique_0402.html.

Empirical work on the underlying causes as well as the impact of the recent dislocations in trade finance has grown rapidly after the global financial crisis. However, the evidence so far is largely based on surveys or country-specific analyses using firm-level data since cross-country analyses are absent due to the paucity of hard data. As a consequence, many of the important policy questions raised by the drop in trade finance during the global financial crisis remain largely unanswered: Did declines in cross-border bank-intermediated trade financing transmit financial shocks across borders? Or did they simply reflect the lesser need for trade financing due, for instance, to weaker growth in trading partners, or subdued domestic economic growth? In other words, did supply or demand drive bank-intermediated trade finance during the global financial crisis?

To shed some light on these issues, this paper presents fresh evidence on the key determinants of bank-intermediated trade finance using a unique, newly constructed panel data set on trade finance. As such, this paper is the first attempt at understanding the determinants of bank-intermediated trade finance for a set of countries and thus makes an important contribution to the empirical literature in this field. Our results indicate that both global and country-specific factors, such as growth in trade flows and the funding availability of domestic banks, are important determinants of trade finance. The results are robust to alternative model specifications as well as changes in the cross-sectional dimension of the data set. In particular, the main results hold when we use instrumental variables to control for the potential endogeneity of trade flows growth. Results are also robust to random-effects estimation, which we undertake in order to address any potential small sample bias.

Overall, our findings suggest that the short-term, self-liquidating nature of trade finance could generate some scope for negative externalities for the global economy, especially if the banking sector is subject to global shocks. These externalities can be amplified if a large number of banks simultaneously run down their liquidity pool embodied in their trade finance portfolios. We elaborate on the implications of the results in sections 5 and 6.

The remainder of the paper is structured as follows. Section 2 summarizes the related literature. Section 3 provides a brief description of trade finance instruments and summarizes the evolution of

trade finance during the global financial crisis. Section 4 describes the data, the empirical methodology, and the choice of explanatory variables. Section 5 discusses the results and section 6 concludes.

2. Related Literature

Our work makes two key contributions to the empirical literature on trade finance. First, it provides fresh evidence on the determinants of bank-intermediated trade finance—an area that has been hitherto unexplored due to the lack of hard data. Previous empirical work has generally focused on firm-level data in a country-specific setting to analyze firms' choice with regard to different payment contracts. For example, Ahn (2013) finds evidence of a substantial impact of bank liquidity shocks on the supply of letters of credit import transactions in Colombia during the 2008–09 crisis. In a similar vein, Antras and Foley (2011) use detailed transaction-level data for a U.S.-based exporter to study how the choice between cash-in-advance and open account is affected by the characteristics of the country in which the importer is located. In a more recent paper, Niepmann and Schmidt-Eisenlohr (2013), using U.S. banking data, find that the volume of banks' trade finance claims differs substantially across destination countries, with claims being hump shaped in country credit risk and increasing with the time to import of a destination market. The authors also find that trade finance claims vary systematically with global conditions, expanding when aggregate risk is higher and funding is cheaper.

Rather than taking these firm-specific approaches and focusing on certain instruments, such as letters of credit, our study takes a more comprehensive view to examine the key determinants of bank-intermediated trade finance as a whole and for a set of countries.⁴ To the best of our knowledge, this is the first study to use such an approach, one that allows us to investigate the role of country-of-origin variables (frequently called “home variables”) in driving

⁴See tables 8 and 9 in the data appendix for a description of the country-specific data on trade finance used in this paper. We refer the reader to CGFS (2014) for an in-depth description of the data, as well as a comparison with other sources of information.

trade finance. The results, therefore, complement previous empirical work that has focused primarily on either bank-level information or country-of-destination information. Further, it is informative to analyze trade finance as a whole since it encompasses a wide range of instruments, and market intelligence suggests that firms can switch relatively easily from one instrument to another, making the distinction between instruments blurred at times.

Second, our work is also related to the strand of empirical literature focusing on the relationship between financial conditions, trade credit, and trade at the firm and sectoral levels. This literature has aimed at understanding and measuring the impact of disruptions in trade finance on the so-called Great Trade Collapse. At the firm level, Behrens, Corcos, and Mion (2013), Bricongne et al. (2012), and Coulibaly, Saprizza, and Zlate (2011) all find that financial constraints explain part of the decline in production and exports during the trade collapse. Using sector-level data, Chor and Manova (2012) examine how the sector composition of exports to the United States varies across countries depending on the cost of finance in those source countries. The authors find that tight financial conditions (i.e., higher interbank interest rates) led exports to fall more during the 2008–09 crisis in sectors with high external finance dependence or low asset tangibility. Further, they demonstrate that countries with tight financial conditions exported less to the United States than countries where financial conditions were less tight. Our paper contributes to this literature by showing that, controlling for trade flows, trade finance depends on global financial conditions and funding availability for domestic banks, and accordingly can be impaired by financial shocks.

3. Trade Finance: Instruments and Dynamics during the Global Financial Crisis

The term “trade finance” is generally used for financial instruments that are specifically linked to underlying international trade transactions (exports or imports). Banks and other institutions typically provide trade finance for two purposes. First, it serves as a source of working capital for individual traders and international companies

in need of liquid assets.⁵ Second, trade finance provides credit insurance against the risks involved in international trade, such as currency or price fluctuations, or political risk. While we acknowledge that some trade finance instruments may be long term in nature, in this paper we focus only on short-term bank-intermediated trade finance, because it funds a much larger volume of trade and is also closely linked with overall bank funding conditions.

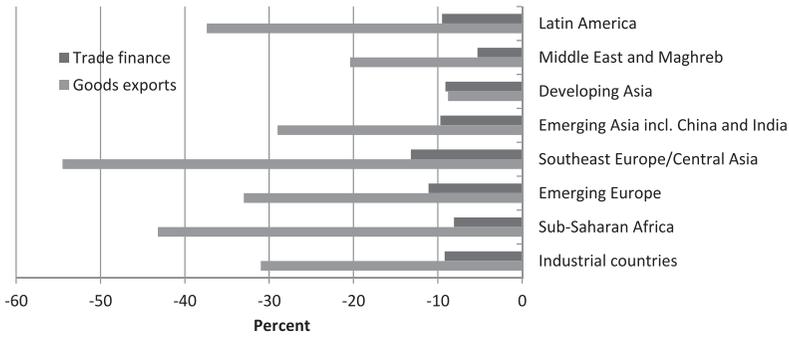
Trade finance comprises a wide range of products used to reduce risks related to international payments between importers and exporters. One of the most common and standardized forms of bank-intermediated trade finance is a letter of credit (or L/C). L/Cs reduce payment risk by providing a framework under which a bank makes (or guarantees) the payment to an exporter on behalf of an importer once goods have been shipped or delivered.⁶ Banks may also help meet working capital needs by providing trade finance loans to exporters or importers, i.e., short-term loans used to buy the inputs necessary to produce goods ordered by foreign customers. In this case, the loan documentation is linked either to an L/C or to other forms of documentation related to the underlying trade transaction. Working capital is more important for financing export shipments than for domestic shipments because of the longer lag between production and payment for exports (Amiti and Weinstein 2011).

With respect to the recent developments in the market for trade finance, figure 1 shows the drop in trade finance and trade at the peak of the global financial crisis—between October 2008 and January 2009. The fall in trade finance was about one-third of the contraction in global merchandise trade, with the largest declines witnessed in Emerging Europe and Central Asia. In the aftermath of the crisis, the International Monetary Fund (IMF) together with the Bankers' Association for Finance and Trade–International Financial Services Association (BAFT-IFSA) undertook a survey on pricing,

⁵A working capital loan not specifically tied to trade is typically not included in this definition.

⁶For the most part, L/Cs represent off-balance-sheet commitments, though they may, at times, be associated with an extension of credit. This can occur, for example, if an import L/C is structured to allow the importer a period of time (known as “usance”) before repaying the bank for the payment it made on the importer's behalf.

Figure 1. Changes in Merchandise Exports and Trade Finance between October 2008 and January 2009 (percentage change)



Source: Asmundson et al. (2011).

volumes, and drivers in trade finance markets in March 2009.⁷ This was followed by several additional survey rounds. The results of these surveys showed that changes in trade finance conditions were particularly pronounced among large banks that suffered most from the crisis and were thus in greater need to deleverage quickly. Further, the surveys showed that banks also increased the cost to borrowers. Regarding the underlying causes for the decline in trade finance, the surveyed banks identified the fall in demand for trade as the major reason for the decline in trade finance, and attributed about 30 percent of the fall to reduced credit availability at either their own institutions or counterparty banks.⁸ While these surveys provide valuable insights into the developments in the market for trade finance, quantitative estimates derived from them should be treated with caution, as survey respondents usually provide only directional indications instead of details for their firm which can then be aggregated (CGFS 2014). In contrast, by using objective data, this paper

⁷The 2009 survey, by the International Monetary Fund and the Bankers’ Association for Finance and Trade, is titled “IMF-BAFT Trade Finance Survey: A Survey Among Banks Assessing the Current Trade Finance Environment.”

⁸Asmundson et al. (2011) provides a summary of the first four IMF surveys.

provides a more nuanced perspective on the underlying determinants of trade finance.

4. Data and Methodology

4.1 Data

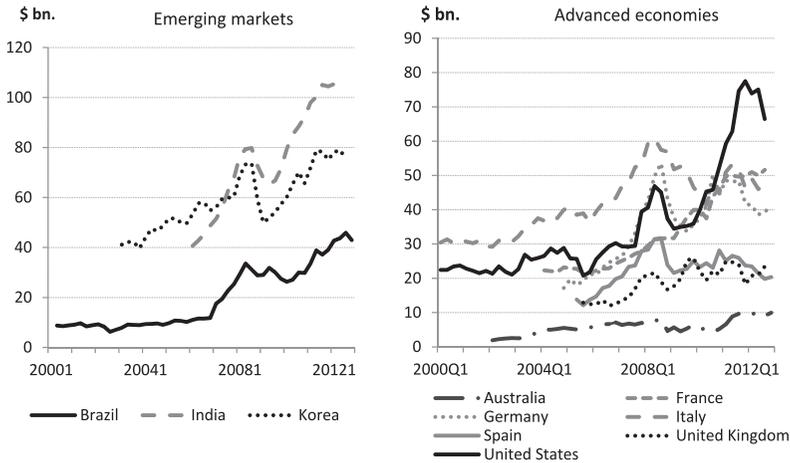
The data on trade finance used in this paper were put together by members of the Study Group on Trade Finance under the auspices of the Committee on the Global Financial System (CGFS).⁹ The sample includes the following ten countries: Australia, Brazil, France, Germany, India, Italy, Korea, Spain, the United Kingdom, and the United States. The sample spans the time period 2001:Q1 to 2012:Q4, although the trade finance data are not available for the entire time period for some countries, resulting in an unbalanced panel.

A few recent trends in the data are worth highlighting. Globally bank-intermediated trade finance has increased substantially in dollar terms over the past decade, particularly since the end of 2006. The pace, however, has diverged significantly across countries in recent years (figure 2). The growth in trade finance is particularly notable in some of the emerging market countries in our sample, which in turn corroborates anecdotal evidence that local banks in these countries are playing a greater role in the provision of trade finance (CGFS 2014).

Table 8 in the data appendix provides a detailed description of the country-specific data on trade finance. Data coverage in terms of trade finance instruments differs substantially across countries. While countries like Brazil, India, Italy, and Korea have detailed data covering a significant share of overall trade finance activities, others have statistics capturing only specific components of their trade finance markets, such as export-related trade finance or letters of credit (L/Cs). For most countries, the available data capture only on-balance-sheet lending activities (i.e., L/Cs are excluded, except when they are tied to or become funded loans) by resident banks, and focus on lending to domestic borrowers. Further, it is important

⁹The final report of the Study Group (CGFS 2014) can be found at <http://www.bis.org/publ/cgfs50.htm>.

Figure 2. Trends in Trade Finance (in billions of U.S. dollars; quarterly data)



Sources: CGFS and national authorities.

to note that bank-intermediated trade finance is a part of international credit. The latter comprises banks’ cross-border lending and their claims on non-banks in foreign currency, regardless of whether the foreign-currency lending is extended inside or outside the country (Avdjiev, McCauley, and McGuire 2012).

To provide a comparison of the data across countries, table 9 in the data appendix briefly summarizes the main features of the data in terms of reporting population, cross-border reach, main counterparties, and instruments. In eight out of the ten jurisdictions in our sample, trade finance data reflect lending booked by resident banks in a given home country vis-à-vis residents of that home country. These seven jurisdictions are Australia, Brazil, France, India, Italy, Korea, and Spain. Overall, these data are consistent with the spirit of the Bank for International Settlements (BIS) Locational Banking Statistics (LBS) data.¹⁰

In contrast, in the case of Germany and the United States, some aspects of the data are more similar to the BIS Consolidated Banking

¹⁰In the case of Spain and Australia, the data also include claims by foreign branches and subsidiaries of banks headquartered in these countries.

Statistics (CBS): trade finance includes claims by domestic banking institutions worldwide, with a focus on non-resident borrowers.¹¹ Further, in these two countries trade finance by foreign branches and subsidiaries of national banks is also included.

The data should be well suited to analyze the role of home factors in driving trade finance as long as a strong decoupling between residence and nationality does not exist. Such a decoupling occurs when a jurisdiction hosts many foreign banks, whose activities are likely not affected by domestic factors, such as sovereign creditworthiness, trade flows, or other country-specific macroeconomic fundamentals. For example, this decoupling could pose a challenge when analyzing countries that are “financial hubs,” acting as hosts of branches and subsidiaries of foreign banks. While banks in these jurisdictions book their trade finance activities locally, their lending likely has little to do with host-country factors such as trade flows or sovereign risk (see, for example, Fender and McGuire 2010). Among the countries in our sample, only the United Kingdom exhibits features of a financial hub. This becomes clear when one examines the lending patterns by resident banks using the newly published BIS LBS data, which show that the proportion of local claims (i.e., lending to residents) to total claims (on all borrowers) is very high in all jurisdictions except for the United Kingdom.¹²

In light of the heterogeneous nature of trade finance across countries described above, each national data source should be viewed as providing a partial window into aspects of the bank-intermediated trade finance activities conducted in that country (CGFS 2014). We include country-specific fixed effects in our estimations to account

¹¹It is important to note that for the United States there are some key differences between the trade finance data used in the paper and that in the BIS CBS, although the source data for both come from the FFIEC Country Exposure Lending Survey. Our data set comprises trade finance lending by U.S. banks, which includes U.S. holding companies owned by foreign banks, but excludes U.S. branches of foreign banks. In the BIS CBS, however, only U.S. holding companies owned by banks headquartered in a non-reporting country are included in the sample, while other entities are removed to avoid double counting.

¹²Specifically, resident banks’ local claims relative to total claims are as follows: Australia: 84 percent; Brazil: 96 percent; France: 70 percent; Germany: 72 percent; India: 97 percent; Korea: 89 percent; Spain: 83 percent; and the United Kingdom: 58 percent. For Italy and the United States, this ratio cannot be computed due to lack of data.

for the differences in data measurement across countries. In addition, we also examine the sensitivity of our main results to the exclusion of the key countries for which the trade finance data are more dissimilar (i.e., Germany, United Kingdom, and United States).

4.2 Empirical Framework

Our research question is closely related to the growing literature on the determinants of international credit. Recent papers in this strand of literature, such as Avdjiev, Kuti, and Takáts (2012), Avdjiev, McCauley, and McGuire (2012), Bruno and Shin (2015), Hermann and Mihaljek (2010), McCauley, McGuire, and Sushko (2015), and Takáts (2010), suggest that such flows are driven by both global and local (i.e., country-specific) factors. Since bank-intermediated trade finance is mostly dollar denominated, it is a subset of total international credit. Thus, our empirical specification and choice of explanatory variables are also guided by the above literature. Specifically, following Avdjiev, Kuti, and Takáts (2012) and Bruno and Shin (2015), our benchmark specification in its general form is given by

$$\Delta TF_{it} = \alpha + \sum_k \beta_k X_{k,i,t} + \sum_l \beta_l Y_{l,t} + \alpha_i + \varphi_y + \gamma_q + \varepsilon_{i,t}, \quad (1)$$

where ΔTF_{it} denotes the growth in the outstanding volume of bank-intermediated trade finance for country i , $X_{k,i,t}$ are k country-specific exogenous variables, and $Y_{l,t}$ denotes l global variables. The benchmark measure of the dependent variable is the quarter-over-quarter (qoq) rate of growth of trade finance, calculated as the difference between $\log(\text{tradefinance})_t$ and $\log(\text{tradefinance})_{t-1}$.¹³ We include country-specific fixed effects, α_i , in equation (1) to account for the differences in the way in which trade finance is measured across countries, as well as for any additional country-level effects not captured by our control variables. However, admittedly, not every potential source of heterogeneity can be controlled for. We also acknowledge the possible existence of year-specific and

¹³An alternative would be to define trade finance relative to trade flows. Instead, we include trade flows as an explanatory variable in the benchmark estimations.

quarter-specific factors, which are captured by the time dummies φ_y and γ_q , respectively.¹⁴ Table 10 in the data appendix provides further details on all the variables included in the analysis.

In what follows, we describe our selection of the global and country-specific explanatory variables in detail. With regard to global factors, Bruno and Shin (2015) argue that global financial conditions are the key drivers of cross-border bank flows—and, accordingly, we expect them to be drivers of bank-intermediated trade finance. We include three different measures as proxies for global financial conditions. First, we use the VIX index of implied volatility of S&P 500 equity index options—which is the most widely used measure of global financial conditions in the literature. Second, we use a synthetic indicator of financial stress, namely, the financial conditions index (FCI), which is based on the methodology of Guichard, Haugh, and Turner (2009). The FCI is derived from real short-term interest rates, real long-term interest rates, the real effective exchange rate, bond spreads, stock market capitalization, and credit standards in the euro area, Japan, the United Kingdom, and the United States.¹⁵ As such, it is a more comprehensive measure of global financial conditions than the widely used VIX index.

Finally, since trade finance is predominantly denominated in U.S. dollars—even more so than global trade—the ability of banks to provide trade finance can be disrupted if banks' dollar funding lines are curtailed (CGFS 2014).¹⁶ Indeed, this seems to have been the case in some instances in 2008–09 and in 2011–12.¹⁷ We account for dollar funding pressures in our framework by including the three-month U.S. LIBOR-OIS spread as an explanatory variable. We expect this variable to have a negative impact on bank-intermediated trade finance. Trade finance may also be affected by other global

¹⁴A potential caveat with respect to these time dummies is that they may not fully capture the seasonal patterns in the data which might differ across countries from the Northern and Southern Hemisphere included in our sample.

¹⁵For details on the construction of this variable, see Guichard, Haugh, and Turner (2009).

¹⁶More than 80 percent of L/Cs are settled in U.S. dollars.

¹⁷For instance, reduced dollar funding in the aftermath of the Lehman failure was one of the main reasons for the Brazilian and Korean central banks to provide both direct and indirect support to trade finance markets (CGFS 2014).

variables such as world demand, which we proxy here by global imports growth.¹⁸

Trade finance is also likely to depend on country-specific macroeconomic fundamentals or “pull” factors. We include nominal GDP growth since faster-growing economies are likely to have greater demand for credit (Bruno and Shin 2015).¹⁹ Following recent literature on the links between private and sovereign debt, we include the S&P rating as a measure of sovereign creditworthiness. Sovereign defaults are frequently accompanied by domestic banking crises, usually due to the fact that the government postpones the default decision and strains the banking system in order to service the debt, until it is no longer feasible (Arteta and Hale 2008). This would make domestic liquidity more scarce, which in turn would put upward pressure on the cost of trade finance, since banks set rates that account for the higher probabilities of defaults by importers and exporters.

Trade finance may also be facilitated by country-specific financial factors such as the leverage, equity, and funding costs of local banks, although the lack of good-quality data acts as a constraint in testing these hypotheses. As a proxy for local banks’ soundness, again following Bruno and Shin (2015), we use the banks’ capital-to-assets ratio. We expect this measure to be positively correlated with bank-intermediated trade finance growth. Following the recent literature, we also include the five-year credit default swap (CDS) spreads for each banking sector as a measure of banks’ riskiness and short-term funding costs in wholesale markets (for example, Chui et al. 2010). We construct this measure as a simple average of the CDS spreads for the main banks in each country (see table 11 in the data appendix). Finally, we also include the (country-specific) growth in trade flows (defined as the sum of exports and imports), which is expected to be an important determinant of trade finance. Table 1 provides the summary statistics for the main variables.

Estimating equation (1) poses some challenges. First, there is potential endogeneity arising from the inclusion of growth in trade flows as an explanatory variable. Second, global factors are likely

¹⁸ Another alternative is to use global real GDP growth, but we consider global imports growth to be a better proxy for global demand conditions.

¹⁹ There is also evidence that foreign bank lending to emerging markets is procyclical (see Jeanneau and Micu 2002).

Table 1. Summary Statistics

| | Mean | Standard Deviation | Min. | Max. |
|---|-------------|-------------------------------|-------------|-------------|
| Trade Finance Growth (Percentage Points) | 0.02 | 0.10 | -0.57 | 0.39 |
| Trade Flows Growth (Percentage Points) | 0.02 | 0.09 | -0.53 | -0.27 |
| Bank Capital to Total Assets (Percentage Points) | 6.98 | 2.14 | 3.7 | 12.1 |
| CDS Spreads (Percentage Points) | 1.15 | 1.14 | 0.05 | 7.14 |
| S&P Rating* | 16.87 | 4.15 | 7 | 20 |
| GDP Growth (Percentage Points) | 1.42 | 1.47 | -3.7 | 7.93 |
| World Imports Growth (Percentage Points) | 0.87 | 3.74 | -16.71 | 6.57 |
| VIX (Level) | 21.94 | 8.49 | 11.03 | 58.32 |
| Financial Conditions Index (Level) | 0.09 | 0.48 | -0.53 | 1.96 |
| LIBOR-OIS Spread (Percentage Points) | 0.28 | 0.36 | 0.07 | 2.13 |

Note: Table 10 provides a detailed description of the variables.
 *S&P ratings are expressed as numerical values using a linear mapping. AAA corresponds to 20, while D corresponds to 0. The threshold between investment grade and junk is 12.

to be important determinants of trade finance, which in turn can be a source of large cross-sectional correlation. Indeed, inference can be misleading if the standard errors are not robust to such cross-sectional correlation. Taking these issues into account, we estimate the benchmark model based on the fixed-effects estimation with Driscoll-Kraay standard errors, which renders errors robust to cross-sectional correlation (Driscoll and Kraay 1998; Hoechle 2007). As mentioned above, we also include the time (i.e., year) dummies in order to control for any additional time-specific sources of cross-sectional correlation. However, this estimation procedure does not eliminate the biases stemming from the potentially endogenous variable, namely, trade flows growth.

Therefore, as a robustness check, we also estimate equation (1) using instrumental variables (IVs) to account for the potential endogeneity of trade flows growth. The IVs should be such that they do not directly determine TF_{it} but are correlated with the variable being instrumented. We consider two potential instruments capturing a country's external demand. To construct these variables, we first identify the top ten trading partners for each country in our sample and compute the share of exports to each of these trading partners in total exports of the particular country. Next, using these trade shares as weights, we compute two weighted aggregate measures and test their validity as instruments. The first variable is the trade-weighted measure of real GDP growth for each country's top ten trading partners. The second instrumental variable is a similar trade-weighted measure of growth in exports to the main trading partners for each country. Both variables are potentially valid instruments, as we expect them to be highly correlated with trade flows growth but uncorrelated with the error term.²⁰ We then estimate equation (1) using the within-2SLS estimator.

An additional issue with regard to estimating equation (1) is the correlation between the global variables, which turns out to be quite strong (table 2). Thus, we include these variables on an individual basis in the regression analysis. We also perform panel unit-root tests (Fisher-type tests) to check for non-stationarity in certain variables (trade finance growth, GDP growth, and banks' capital-to-assets ratio) and do not find any evidence of unit roots.

A final issue relates to the size of the panel. Our data set contains ten countries and an average of thirty quarters.²¹ In this setup, the

²⁰We also consider three competitiveness indicators from the OECD as potential instruments: relative unit labor costs, relative consumer prices, and relative price of exported goods. However, these indicators did not pass the test of validity of instruments.

²¹Incidentally, the small number of countries covered could potentially cast doubts about the generality of the results. However, the jurisdictions covered account for a remarkable fraction of the overall lending. International claims booked in the jurisdictions covered account for 48 percent of total international claims; the corresponding number is 43 percent for total claims ("total claims" include international plus local claims by resident banks, where local claims are defined as lending by resident banks to resident borrowers in domestic currency). The bulk of the international lending not covered in our sample corresponds to just three jurisdictions (Japan, Netherlands, and Switzerland). Data on trade finance are not available for these countries (CGFS 2014).

Table 2. Matrix of Correlations between Global Variables

| | Financial Conditions Index (FCI) | VIX | World Imports Growth (QoQ) | LIBOR-OIS Spread |
|----------------------------------|----------------------------------|-------|----------------------------|------------------|
| Financial Conditions Index (FCI) | 1 | | | |
| VIX | 0.93 | 1 | | |
| World Imports Growth (QoQ) | -0.65 | -0.57 | 1 | |
| LIBOR-OIS Spread | 0.80 | 0.76 | -0.62 | 1 |

Note: The correlations between the financial variables are generally lower once we exclude the peak crisis periods, i.e., 2008:Q4 and 2009:Q1.

fixed-effects estimator can be unstable and non-robust to potentially anomalous samples. As a robustness check, we also reestimate the regressions using the random-effects estimator.

5. Results

5.1 Benchmark Specification

Table 3 shows the benchmark regressions with the quarter-over-quarter growth in outstanding trade finance volumes as the dependent variable. As discussed, all regressions are estimated using fixed-effects estimation with Driscoll-Kraay standard errors. Column 1 includes world imports growth as an explanatory variable, while columns 2–4 include our three measures of global financial conditions individually. Results show that growth in bank-intermediated trade finance is positively associated with trade flows growth (i.e., demand), as expected.²² The CDS spread also has the expected (negative) sign and is statistically significant, indicating that an increase in the riskiness of banks and their short-term funding costs curtails

²²We also included other country-specific macroeconomic fundamentals, such as inflation, budget balance/GDP, and external debt/GDP in the benchmark specification, but the coefficients on these variables were generally not significant. Hence, we do not include them in the benchmark regressions reported here.

Table 3. Determinants of Growth in Trade Finance: Fixed Effects Estimations with Driscoll-Kraay Standard Errors

| | (1) | (2) | (3) | (4) |
|---------------------------------|---------------------|----------------------|----------------------|----------------------|
| Trade Flows Growth | 0.123* [0.070] | 0.201*** [0.056] | 0.195*** [0.071] | 0.229*** [0.049] |
| Bank Capital to Total Assets | 0.007 [0.010] | 0.006 [0.010] | 0.007 [0.009] | 0.006 [0.010] |
| CDS Spreads | -0.011** [0.005] | -0.013** [0.006] | -0.012** [0.005] | -0.016** [0.007] |
| S&P Rating | 0.001 [0.006] | -0.001 [0.007] | -0.000 [0.007] | -0.003 [0.008] |
| GDP Growth | -0.007 [0.004] | -0.006 [0.005] | -0.007 [0.005] | -0.005 [0.006] |
| World Imports Growth | 0.009*** [0.001] | | | |
| VIX | | -0.004*** [0.001] | | |
| Financial Conditions Index | | | -0.068*** [0.022] | |
| LIBOR-OIS Spread | | | | -0.076*** [0.037] |
| Observations | 294 | 294 | 294 | 294 |
| Within R-squared | 0.30 | 0.27 | 0.26 | 0.25 |

Notes: Driscoll-Kraay standard errors are in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the quarter-over-quarter (qoq) growth in the outstanding volume of trade finance. All explanatory variables in growth rates are also in terms of qoq growth. All specifications include year and quarter dummies and country-specific fixed effects and are estimated using the fixed-effects estimation with Driscoll-Kraay standard errors.

trade finance growth. An increase in CDS spreads of 100 basis points is associated with a reduction in trade finance of roughly 1.3 percentage points on a quarter-over-quarter basis.²³ The capital-to-assets ratio of banks, however, does not have a statistically significant impact on trade finance. Unsurprisingly, growth in world imports

²³This is the average impact across the four specifications in table 3.

(i.e., demand) is associated with stronger trade finance growth, and the effect is highly statistically significant.

International financial strains are found to impair trade finance, as exemplified by the negative and highly significant relationship between the VIX, the financial conditions index (FCI), and the LIBOR-OIS spread (columns 2–4). Specifically, an increase of 100 basis points in both the FCI and the LIBOR-OIS spread translates into a drop in trade finance of roughly 7 percentage points. Higher dollar funding costs tend to restrict trade finance probably because of the significant role played by the dollar in global trade. These results are also in line with recent literature, including Bruno and Shin (2015), Rey (2016), and Takáts (2010), which finds that the VIX can explain a substantial part of the variation in cross-border bank lending. Overall, these sizable impacts of the financial variables illustrate well the importance of global financial conditions in determining trade finance flows. Our findings suggest that the short-term nature of trade finance may result in some negative externalities for the global economy, particularly if the banking sector is subject to global shocks.

All in all, the results suggest that trade finance growth depends on global financial conditions, global imports growth, as well as country-specific trade flows growth and funding availability for domestic banks.

5.2 Endogeneity of Trade Flows: Instrumental-Variables Estimation

We reestimate the regressions in table 3 using instrumental variables (IVs). As described in section 4.2, to instrument trade flows growth, we use the two valid instruments identified: (i) a weighted measure of the trade flows growth for each country's main trading partners and (ii) a weighted measure of real GDP growth for each country's main trading partners. The results are reported in table 4.

The Sargan-Hansen test of over-identification confirms that the instruments are valid. The IV estimation results are broadly in line with the benchmark results. Trade flows growth has a positive impact on the growth of bank-intermediated trade finance. This effect is not statistically significant in the first column, perhaps due to the high correlation between the instruments and world

Table 4. Determinants of Growth in Trade Finance: Instrumental-Variables Approach

| | (1) | (2) | (3) | (4) |
|---------------------------------|---------------------|----------------------|----------------------|----------------------|
| Trade Flows Growth | 0.168 [0.109] | 0.268** [0.105] | 0.262** [0.107] | 0.307*** [0.099] |
| Bank Capital to Total Assets | 0.007 [0.011] | 0.007 [0.011] | 0.007 [0.011] | 0.006 [0.011] |
| CDS Spreads | -0.011 [0.009] | -0.012 [0.009] | -0.012 [0.009] | -0.015* [0.009] |
| S&P Rating | 0.001 [0.010] | -0.001 [0.011] | 0.000 [0.011] | -0.003 [0.011] |
| GDP Growth | -0.008 [0.006] | -0.007 [0.006] | -0.008 [0.006] | -0.007 [0.006] |
| World Imports Growth | 0.009*** [0.002] | | | |
| VIX | | -0.003*** [0.001] | | |
| Financial Conditions Index | | | -0.061*** [0.021] | |
| LIBOR-OIS Spread | | | | -0.067*** [0.029] |
| Observations | 294 | 294 | 294 | 294 |
| R-squared | 0.27 | 0.24 | 0.24 | 0.24 |
| Sargan-Hansen Statistic | 0.03 | 0.08 | 0.01 | 0.08 |

Notes: Robust standard errors are in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All specifications include year and quarter dummies and country-specific fixed effects. The dependent variable is the quarter-over-quarter (qoq) growth in the outstanding volume of trade finance. All explanatory variables in growth rates are also in terms of qoq growth. The variable instrumented is “trade flows growth.” We use two measures as instruments: the trade-weighted real GDP growth of the top ten trading partners for each country and the weighted trade flows growth of the top ten trading partners for each country. We assess the validity of instruments using the Sargan-Hansen test.

import growth. Higher world import growth is positively associated with trade finance growth. Global financial conditions have a negative and statistically significant impact on trade finance growth. The coefficient for CDS spreads is only significant in one specification (column 4). A potential explanation for this could be that

the impact of the country-specific variables is not properly identified by the instrumental-variables approach given the cross-sectional correlation that could arise from the presence of the global financial variables.

5.3 Random-Effects Estimator

When the cross-sectional dimension of the data set is small, as in our case, the fixed-effects estimator can be unstable and exhibit lack of robustness to potentially anomalous samples. The variance of the estimator can be large in such cases (see, for example, Clark and Linzer 2015). At the same time, random-effects estimation also has its own disadvantages, particularly the possibility of biases in the estimation due to unobserved, time-invariant heterogeneity. In our case, this problem is somewhat mitigated by the fact that in some country-specific covariates a substantial fraction of the variation is within groups.²⁴ Nevertheless, in order to test the sensitivity of our results to the fixed-effects estimator, we reestimate the model using the random-effects estimator. The results are shown in table 5. They are broadly consistent with the benchmark model, thus underscoring the role of both demand and supply factors as determinants of trade finance lending.

5.4 Sensitivity Analysis: Excluding Germany, United Kingdom, and United States

As discussed in section 4.1, the trade finance data being used are not entirely homogeneous across jurisdictions. Although in most jurisdictions the trade finance data cover lending by resident banks vis-à-vis domestic residents (i.e., locally booked), there are three jurisdictions where this is not the case, although for different reasons: Germany, the United States, and the United Kingdom. In the first two cases, trade finance is generally compiled on a consolidated basis, thus tracking lending by domestically owned banks vis-à-vis non-resident borrowers. In the United Kingdom, these data are compiled

²⁴For instance, 90 percent of the variance in the growth in trade flows occurs within groups. This fraction is over two-thirds in the case of banks' CDS. However, the corresponding fraction for sovereign ratings and banks' capital-to-assets ratio is much lower, at 20 percent and 30 percent, respectively.

Table 5. Determinants of Growth in Trade Finance: Random-Effects Estimations

| | (1) | (2) | (3) | (4) |
|---------------------------------|---------------------|----------------------|----------------------|----------------------|
| Trade Flows Growth | 0.114 [0.077] | 0.194** [0.076] | 0.188** [0.077] | 0.223*** [0.075] |
| Bank Capital to Total Assets | 0.001 [0.003] | 0.001 [0.003] | 0.001 [0.003] | 0.002 [0.003] |
| CDS Spreads | -0.010 [0.007] | -0.011 [0.007] | -0.011 [0.007] | -0.013* [0.007] |
| S&P Rating | -0.003 [0.002] | -0.003 [0.002] | -0.003 [0.002] | -0.003 [0.002] |
| GDP Growth | -0.002 [0.005] | -0.001 [0.005] | -0.002 [0.005] | -0.001 [0.005] |
| World Imports Growth | 0.009*** [0.002] | | | |
| VIX | | -0.004*** [0.001] | | |
| Financial Conditions Index | | | -0.062*** [0.018] | |
| LIBOR-OIS Spread | | | | -0.071*** [0.025] |
| Observations | 294 | 294 | 294 | 294 |
| R-squared | 0.299 | 0.263 | 0.262 | 0.251 |

Notes: Robust standard errors are in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All specifications include year and quarter dummies. The dependent variable is the quarter-over-quarter (qoq) growth in the outstanding volume of trade finance. All explanatory variables in growth rates are also in terms of qoq growth. All regressions are estimated using the random-effects estimator.

on a residence basis, but there is a large presence of foreign banks with outward-oriented activities. Thus, there is potential decoupling between residence and nationality, and resident banks' activity could be independent of U.K.-specific factors.²⁵

²⁵We would like to thank an anonymous referee for pointing this out. As an illustration, consider a U.K. branch of, say, a German bank which is highly active in the trade finance sector. This branch would book its claims in the United Kingdom. It is reasonable to expect that its ability to extend trade finance will be

To examine the sensitivity of our results to this heterogeneity in trade finance data, we estimate the regressions by excluding Germany, the United Kingdom, and the United States, one at a time. The results are shown in table 6 (panels A, B, and C) and are broadly unchanged.²⁶

5.5 *Additional Analysis: Advanced Economies versus EMEs*

Next, we investigate whether emerging market economies (EMEs) and advanced economies are affected differently by some global variables.²⁷ To do so, we create a dummy variable called “EMEs” which takes a value of 1 if a country is classified as an emerging market economy and 0 otherwise. We then interact this variable with each of the four global variables and include the resulting (four) explanatory variables in the regression framework. The coefficient on each variable indicates whether global variables have any differential impact on emerging economies, compared with the benchmark effect.

The results are reported in table 7 and are very similar to the benchmark specification (table 3). Global factors are important in explaining bank-intermediated trade finance in both EMEs and advanced economies; they do not have any additional impact on EMEs. Note that the variables capturing global financial conditions are not significant for EMEs, but this is most likely a consequence of the small sample size.

6. Conclusion

Understanding the drivers of trade finance is important from an academic as well as policymakers’ standpoint since 30 to 40 percent of global trade relies on some version of trade finance. The sharp drop in trade finance during the global financial crisis has raised some important policy questions. However, empirical work on the determinants of trade finance has been very limited due to the lack of

largely unrelated to liquidity conditions in the United Kingdom, such as banks’ capital-to-asset ratios.

²⁶The results remain broadly similar even when all three countries are excluded. These results are not reported for the sake of brevity.

²⁷ Advanced economies include Australia, France, Germany, Italy, Spain, the United Kingdom, and the United States. EMEs include Brazil, India, and Korea.

Table 6. Sensitivity Analysis: Excluding Germany, United Kingdom, and United States

| | A. Excluding Germany | | | B. Excluding United Kingdom | | | C. Excluding United States | | | | | |
|------------------|----------------------|-----------|----------|-----------------------------|----------|-----------|----------------------------|----------|----------|-----------|-----------|----------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Trade Flows | 0.101 | 0.186** | 0.185** | 0.214*** | 0.095 | 0.162** | 0.154** | 0.188*** | 0.110 | 0.179** | 0.175** | 0.206*** |
| Growth | [0.073] | [0.062] | [0.078] | [0.062] | [0.072] | [0.055] | [0.068] | [0.057] | [0.067] | [0.057] | [0.073] | [0.057] |
| Bank Capital to | 0.008 | 0.007 | 0.008 | 0.007 | 0.006 | 0.005 | 0.006 | 0.004 | 0.005 | 0.004 | 0.005 | 0.004 |
| Total Assets | [0.009] | [0.009] | [0.009] | [0.009] | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] |
| CDS Spreads | -0.012** | -0.014** | -0.014** | -0.017** | -0.008* | -0.008 | -0.007 | -0.011 | -0.013** | -0.014** | -0.014** | -0.018** |
| S&P Rating | [0.005] | [0.005] | [0.005] | [0.007] | [0.004] | [0.004] | [0.004] | [0.007] | [0.004] | [0.005] | [0.005] | [0.008] |
| | -0.000 | -0.002 | -0.002 | -0.004 | 0.004 | 0.003 | 0.004 | 0.001 | -0.000 | -0.002 | -0.001 | -0.004 |
| | [0.006] | [0.007] | [0.007] | [0.006] | [0.006] | [0.006] | [0.006] | [0.007] | [0.006] | [0.007] | [0.007] | [0.008] |
| GDP Growth | -0.007 | -0.006 | -0.006 | -0.004 | -0.006 | -0.006 | -0.006 | -0.005 | -0.006 | -0.005 | -0.006 | -0.004 |
| | [0.006] | [0.006] | [0.005] | [0.007] | [0.004] | [0.004] | [0.004] | [0.005] | [0.004] | [0.005] | [0.004] | [0.005] |
| World Imports | 0.009*** | | | | 0.010*** | | | | 0.009*** | | | |
| Growth | [0.001] | | | | [0.002] | | | | [0.001] | | | |
| VIX | | -0.004*** | | | | -0.005*** | | | | -0.004*** | | |
| | | [0.001] | | | | [0.001] | | | | [0.001] | | |
| Financial | | | 0.061** | | | | -0.080*** | | | | -0.069*** | |
| Conditions | | | [0.022] | | | | [0.023] | | | | [0.021] | |
| Index | | | | | | | | | | | | |
| LIBOR-OIS | | | | -0.071* | | | | -0.097** | | | | -0.078** |
| Spread | | | | [0.035] | | | | [0.038] | | | | [0.033] |
| Observations | 263 | 263 | 263 | 263 | 269 | 269 | 269 | 269 | 259 | 259 | 259 | 259 |
| Within R-squared | 0.30 | 0.26 | 0.26 | 0.25 | 0.31 | 0.28 | 0.27 | 0.26 | 0.30 | 0.27 | 0.27 | 0.27 |

Notes: Robust standard errors are in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the quarter-over-quarter (qoq) growth in the outstanding volume of trade finance. All explanatory variables in growth rates are also in terms of qoq growth. All specifications include year and quarter dummies and country-specific fixed effects. In panels A, B, and C, the model is estimated removing Germany, the United Kingdom, and the United States, respectively.

Table 7. Additional Analysis: Effect of Global Variables on Advanced Economies vs. EMEs

| | (1) | (2) | (3) | (4) |
|------------------------------------|---------------------|----------------------|----------------------|----------------------|
| Trade Flows Growth | 0.126* [0.067] | 0.204*** [0.057] | 0.199*** [0.072] | 0.227*** [0.061] |
| Bank Capital to Total Assets | 0.006 [0.010] | 0.005 [0.010] | 0.006 [0.010] | 0.003 [0.010] |
| CDS Spreads | -0.018** [0.007] | -0.017** [0.006] | -0.015** [0.007] | -0.023** [0.008] |
| S&P Rating | -0.007 [0.009] | -0.007 [0.010] | -0.004 [0.011] | -0.012 [0.009] |
| GDP Growth | -0.004 [0.004] | -0.005 [0.005] | -0.006 [0.005] | -0.004 [0.005] |
| World Imports Growth | 0.010*** [0.001] | | | |
| EMEs*World Imports Growth† | -0.005* [0.002] | | | |
| VIX | | -0.004*** [0.001] | | |
| EMEs*VIX | | 0.001 [0.001] | | |
| Financial Conditions Index | | | -0.068*** [0.021] | |
| EMEs*Financial Conditions Index | | | 0.012 [0.021] | |
| LIBOR-OIS Spread | | | | -0.078*** [0.034] |
| EMEs*LIBOR-OIS Spread | | | | 0.044 [0.027] |
| Observations | 294 | 294 | 294 | 294 |
| Within R-squared | 0.31 | 0.27 | 0.26 | 0.26 |

Notes: Driscoll-Kraay standard errors are in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable in regression (1)–(4) is the qoq growth in the outstanding volume of trade finance. All explanatory variables in growth rates are also in terms of qoq growth. All specifications include year and quarter dummies and country-specific fixed effects.
†This variable is constructed as the interaction of the “EME” dummy with the qoq growth in world imports. The variables EMEs*VIX, EMEs*Financial Conditions Index, and EMEs*LIBOR-OIS Spread are constructed in a similar fashion.

availability of data, with previous studies having focused on developments in specific countries. Our paper addresses this gap by analyzing the main determinants of bank-intermediated trade finance using a newly constructed data set in a panel estimation framework.

Results indicate that bank-intermediated trade finance is impaired by global financial strains, while it depends positively on global imports growth. Country-specific variables, namely, growth in trade flows, and the funding availability of domestic banks—as measured by the banks' CDS spreads—are also important determinants of trade finance. These results are robust to different model specifications. We believe that our results mark an improvement over existing research, which has focused either on firm-specific data or on specific instruments, while our data set provides a more comprehensive coverage of trade finance within each country.

We acknowledge that there are other potentially relevant drivers of bank-intermediated trade finance that have not been included in our analysis. These include measures of contractual enforcement, bank lending restrictions, and foreign exchange restrictions, as well as additional country-specific measures of banking system soundness. However, including these indicators in an econometric framework is challenging given the lack of good-quality data. Further, policy responses to mitigate the impact of global financial conditions probably played an important role in determining trade finance developments. Given the small sample size and the significant heterogeneity in policy responses across countries, we leave these questions to be addressed in future research.

Data Appendix

Table 8. Trade Finance Data

| Country | Data Description | Source |
|----------------|--|--|
| Australia | Stock of banks' contingent liabilities arising from trade-related obligations (e.g., documentary L/Cs issued, acceptances on trade bills or shipping guarantees issued). | Reserve Bank of Australia |
| Brazil | Stock and flows of resident banks' trade finance vis-à-vis residents for exports and imports. | Central Bank of Brazil |
| France | Stock of trade finance, including both buyer and supplier credit lines. | Bank of France |
| Germany | Estimations for the volume of short-term trade finance to emerging and developing countries, covering maturities of twelve months or less. | Deutsche Bundesbank (Not Public) |
| India | Stock of short-term loans and advances of pre- and post-shipment bank-intermediated export credit, as well as stock and flows of import credit extended by banks with maturities of less than three years. | Reserve Bank of India |
| Italy | Stock of loans and guarantees for import and export purposes by domestic banks. | Italian Credit Register (Not Public) |
| Korea | Stock of documentary bills, domestic import usance bills, and pre-shipment finance. | Bank of Korea, Financial Supervisory Service |
| Spain | Stock of commercial credit to non-residents and documentary credit to residents and non-residents, granted by banks operating in Spain. | Bank of Spain (Not Public) |
| United Kingdom | Estimates derived from reported amounts for "lending under Export Credit Guarantee Department bank guarantee" and "holdings of non-resident bills," which may be discounted for trade finance purposes. | Bank of England (Not Public) |
| United States | Stock of bank-intermediated, short-term trade finance (including funded loans and unfunded off-balance-sheet commitments and guarantees) vis-à-vis foreign residents on an ultimate risk basis. | FFIEC Country Exposure Lending Survey* |

Source: CGFS (2014).

*FFIEC stands for the Federal Financial Institutions Examination Council.

Table 9. Trade Finance Data: Coverage, Counterparties, and Instruments

| | Institutions Covered | | | Counterparties | | Instruments | |
|----------------|----------------------|------------------------------------|--|----------------|----------------|-------------|--------------------|
| | Resident Banks | Cross-Border Branches ¹ | Cross-Border Subsidiaries ¹ | Residents | Non-residents | Loans | L/C and Guarantees |
| Australia | X | X | X | X | | X | |
| Brazil | X | | | X | | | |
| France | X | | | X | | | P |
| Germany | X | P | P | | P ² | X | P |
| India | S | | | X | | X | |
| Italy | X + OFIs* | | | X | | X | X |
| Korea | X | | | X | | X | |
| Spain | X | | | X | | P | X |
| United Kingdom | X | | | X | | P | P |
| United States | X | X | X | | X | X | X |

Sources: CGFS (2014), country-specific sources, and authors' classification.
Note: X = dimension is captured; P = dimension is partially captured.
 *OFIs = other financial institutions.
¹Foreign operations of home-headquartered banks.
²Only to residents of emerging markets and developing countries.

Table 10. Description of Variables

| Variable | Source | Description |
|---|--|---|
| Country-Specific Variables | | |
| Nominal GDP Growth | National Statistical Agencies via Haver | Quarter-over-quarter (annualized rate) growth in percentage points; seasonally adjusted. |
| S&P Rating | Standard & Poor's | We transform ratings into numerical values, using a linear mapping. AAA corresponds to 20, while D corresponds to 0. The threshold between investment grade and junk is 12. |
| Banks' Capital-to-Assets Ratio | WDI (Annual Data—Interpolated) | In percentage points. |
| Trade Flows Growth (Sum of Exports and Imports) | CGFS (2014) | Qoq growth in percentage points, calculated as log-differences. |
| CDS Spreads | Datastream | Five-year CDS spreads, in percentage points, measured as the average of the CDS spreads for the main banks in each country (as listed in table 9). |
| Global Variables | | |
| VIX Index | Haver Analytics | In level. |
| Financial Conditions Index (FCI) | Banco de España, National Statistical Agencies | Constructed following Guichard, Haugh, and Turner (2009). The index covers four economic areas: the United States, the United Kingdom, Japan, and the euro area. |
| Imports Growth | World Bank, World Development Indicators | In each country/region, the index aggregates information on credit conditions, bond spreads, real and short-term interest rates, and real effective exchange rates. |
| LIBOR-OIS Spread | Bloomberg | Qoq growth in percentage points, calculated as log-differences. The spread between the three-month LIBOR and the three-month USD overnight indexed swap quarterly average, expressed in percentage points. |

Table 11. List of Banks Included in CDS Spreads (Five Years) Measure

| Country | Banks |
|---|--|
| Australia | National Australia Bank |
| Brazil | Banco do Brasil, Bradesco, Votorantim |
| France | BNP Paribas, Credit Agricole, Société Générale |
| Germany | Deutsche Bank AG, Commerzbank AG |
| India | ICICI Bank, State Bank of India |
| Italy | Intesa Sanpaolo, Unicredito Italiano |
| Korea | Hana Bank, Woori Bank, Kookmin Bank |
| Spain | Banco Santander, BBVA |
| United Kingdom | Barclays Bank, Lloyds Bank, RBS Group PLC, HSBC Bank PLC |
| United States | Bank of America, Citigroup Inc., Goldman Sachs, JP Morgan Chase, Morgan Stanley, Wells Fargo |
| <p>Source: Datastream. Note: For Brazil, we use the sovereign CDS spreads for the period prior to 2011 as a proxy since the information on banks' CDS spreads is only available from 2011.</p> | |

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