

What Drives Private Non-Financial Sector Borrowing in Emerging Market Economies?

Ramona Jimborean*

Abstract – The last decade has been characterised by a considerable increase in private non-financial sector borrowing. Through a panel data analysis performed with quarterly data over the period 1993-Q1 to 2014-Q3, the article shows that, in emerging market economies (EMEs), the buildup phase of the high private non-financial borrowing is associated with: an increase in credit demand; real currency appreciation; accommodative monetary policy stance and reduced macroeconomic vulnerabilities complemented by a healthy and large domestic banking system. In addition, global factors, such as the US dollar appreciation, high global financial market volatility and the US monetary policy stance, are found to explain the recent increase in private non-financial sector borrowing in EMEs.

JEL Classification: F34, G15, G21

Keywords: emerging market economies, cross-border borrowing

Reminder:

The opinions and analyses in this article are those of the author(s) and do not necessarily reflect their institution's or Insee's views.

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Why should we care about private non-financial sector (NFS) indebtedness in emerging market economies? The overall picture is that of a significant increase in private NFS debt over the last decade all over the world. In emerging market economies (EMEs) this raises concerns given that the large majority of previous emerging market financial crises have been preceded by rapid leverage growth (as documented among others by Kaminsky & Reinhart, 1999; Gourinchas *et al.*, 2001). Moreover, the buildup of corporate leverage has often been associated with boom-bust cycles (Mendoza & Terrones, 2008) and, more generally, with financial turbulences (Elektdag & Wu, 2011; Schularik & Taylor, 2012). Today, the perspectives are of an economic (persistent) slowdown in EMEs and of a tightening of the US monetary policy stance that would trigger more restrictive global funding conditions. In this context, questions arise related to the potential risk of financial instability in EMEs in the near future.

As underlined by Acharya *et al.* (2015) the non-financial corporations (NFC) face four categories of risks: maturity mismatches (i.e. funding being shorter term than investment); currency mismatches (i.e. liabilities being denominated in different currencies as opposed to revenues); rollover risk caused by a fickle investor base; and transaction risks caused by speculative activities. A shock of stress/failure in a global NFC will affect not only the domestic economy and the domestic financial system, but will also have cross-border effects. For the domestic economy the consequences will be: a decrease in aggregate demand and investment that would potentially trigger the recession; additional pressure on sovereign; and contagion to sectors/industries through production chains. As regards the domestic financial system, the main effects of a stress in a global NFC are: impaired banking system assets through losses associated with loans and securities issued domestically; a run on banking system liabilities,¹ especially where there is a strong reliance on corporate deposits for the wholesale funding; and an increase in bank funding from banks (i.e. higher interconnectedness among banks). As for the cross-border spillover effects, they are related, among others, to losses associated with cross-border loans and securities issued abroad.

The issue of non-financial corporates (NFC) debt in EMEs has been largely debated lately, given its implications, both in terms of

financial stability and of economic growth. The G-20 recommended the examination of factors that “shape the liability structure of corporates focusing on its implications for financial stability”. An interim report² on “Corporate funding structures and incentives” has been prepared, showing that the structure of corporate funding is affecting both the resilience and the decision-making of individual corporates³ and, at the aggregate level, the stability of the financial system. In addition, the IMF has addressed the issue of corporate leverage in emerging markets in its October 2015 Global Financial Stability Report. The IMF analysis concludes that corporate leverage is explained by a higher role of global factors and, as a consequence, stresses the need for emerging markets to prepare for the implications of global financial tightening.

This paper adds to the recent work of international organisations and seeks to assess the drivers of private NFS borrowing in EMEs. Furthermore, this work complements the existing empirical literature on the determinants of foreign bank lending to EMEs that uses the BIS (Bank for International Settlements) statistics. Its contribution consists in examining the drivers of the bank-related components of private NFS indebtedness, while considering all its forms: domestic, bank and non-bank, and cross-border. I carry out the analysis from the perspective of recipient EMEs and focus on: 1) domestic bank credit; 2) cross-border bank lending to private NFS; and 3) their borrowing from all sectors (bank and non-bank). While international debt securities are equally a part of the overall indebtedness of private NFS they are not included in the analysis mainly because of data availability reasons; an additional reason is that of the predominance of bank financing in EMEs and the rather low development of their capital markets.

I use the BIS long series on total credit and domestic bank credit to private NFS and the BIS Consolidated Banking Statistics, the only existing databases at the international level that allow cross-country analyses. I apply a panel regression framework with quarterly data. The main results are that of private NFS

1. Corporates proceed to withdrawals so as to meet their obligations vis-à-vis creditors.

2. The report has been prepared by the FSB Secretariat, based on the contributions made by the staff of IMF, OECD, BIS, IOSCO and World Bank.

3. The corporate sector's sensitivity to macroeconomic and financial shocks increases in case of higher debt loads and lower debt-servicing capacity (IMF, 2015b).

borrowing in EMEs being explained, over the period 1993-Q1 to 2014-Q3, by local factors like a high credit demand, real currency appreciation, an accommodative monetary policy stance, reduced macroeconomic vulnerabilities, a healthy and large domestic banking system; and global factors like the high global financial market volatility and the US monetary policy stance.

The remainder of the paper is organised as it follows. The next sections presents some stylised facts, then an overview of the literature. The third section describes the econometric model and the data, as well as the empirical results. A final section summarises the main conclusions.

Private Sector Borrowing in EMEs: Stylised Facts

As emphasized in the introduction, a key challenge for EMEs is the increase in the indebtedness of private NFS, driven by a combination of low yields in international debt markets and strong demand from international investors.

A first issue is that of stress on corporate balance sheets that could rapidly spill over into other sectors, inflicting losses on the corporate debt holdings of global assets managers, banks and other financial institutions. This could be a source of powerful feedback loops in response to interest rate and/or exchange rate shocks, especially if credit risk concerns prevent the rollover of existing bank or bond market funding.

Second, there is the issue of the high sensitivity of corporates to macroeconomic and financial shocks associated with the recent increase in corporate debt levels and lower debt-servicing capacity in some countries (Giroud & Muller, 2015). In addition, the high private-sector debt can have a negative impact on economic growth (Liu & Rosenberg, 2013), and can potentially reinforce recessions (through a reduction in aggregate demand) and hamper recovery.

As illustrated by private sector credit developments data,⁴ financial deepening and boom-bust episodes took place in EMEs, similar to advanced economies. Regional differences can be noted though: while in Emerging Asia private NFS indebtedness is large (higher than 120 percent of GDP at 2014-Q2), in Latin America and Emerging Europe it has

continuously increased since early 2000 (but remained lower than 90 percent of GDP at 2014-Q2, countries like Mexico lagging behind).

As regards the role of banks in the financing of private NFS, intuitively, one would expect domestic banks to become a less important source of financing along with the deepening of financial intermediation. If this applies to advanced economies, the intuition is less clear-cut in the case of EMEs. On one hand, in Latin America, domestic and cross-border banks have become more important providers of credit over time, especially in Argentina and Brazil where the ratio of bank credit to total credit to private NFS is superior to 90 percent. On the other hand, in Asian economies, the role of banks (domestic and cross-border) has considerably diminished in China, Hong Kong SAR and South Korea (to roughly 65-80 percent), while it continued to be high in India, Indonesia, Malaysia, Singapore and Thailand (superior to 85 percent in 2014-Q2). As for Emerging Europe, domestic and cross-border bank credit plays a lower role, with less than 70 percent of total credit to private NFS. One common feature that emerges is that of the persistence of domestic and cross-border bank credit as main sources of financing of the private NFS in EMEs (Figure I).

The analysis by sector⁵ shows that, overall, NFC borrowing from all sectors has largely overpassed that of households (HHs) (Figure II). There are, however, several exceptions: Thailand (where HHs borrowing has overpassed that of NFCs since the 2007 global financial crisis); and South Africa (with persistent larger HHs borrowing).

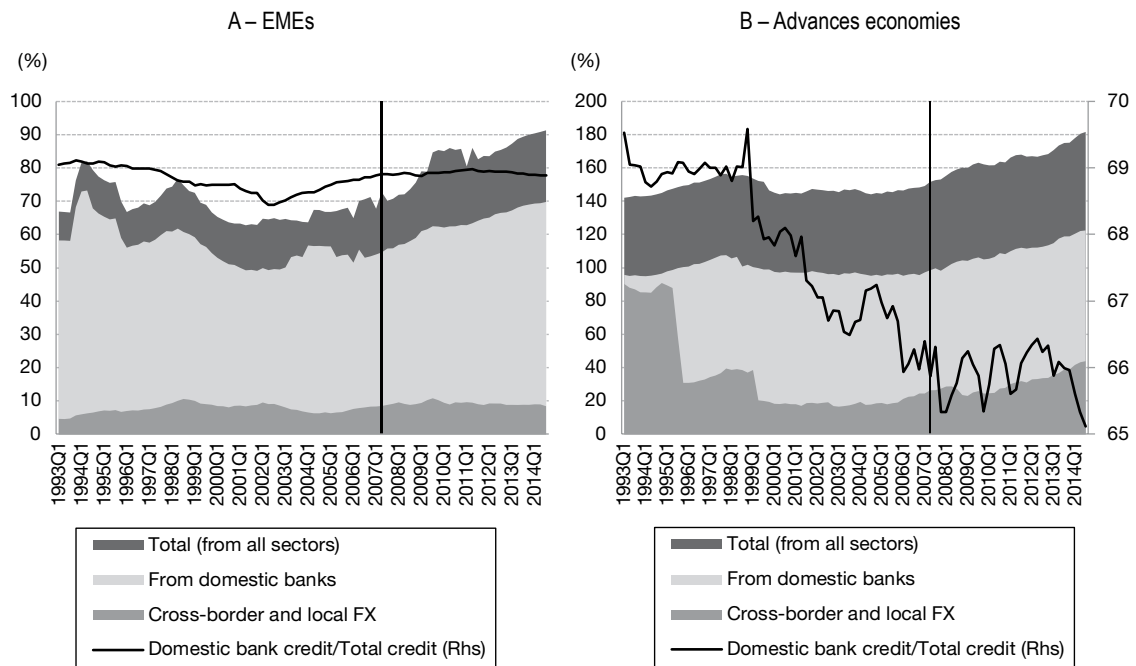
Related to the other sources of financing, NFCs have kept on increasing the issuance of debt securities in recent years. However, the overall quantities are reduced given the rather low initial level of corporate bond issuance in EMEs (Figure III), as also illustrated by Acharya *et al.* (2015) and the IMF (2015a).⁶ A common

4. I use the BIS long series on total credit and domestic bank credit to private NFS. 17 out of the 40 economies covered by this database are EMEs. The series account for credit from all sources, not only that extended by domestic banks; thus, securitized credits held by the non-bank financial sector and cross-border lending are equally taken into account. Trade credit (as well as other accounts payable and receivable) is excluded from the new total credit series given the poor quality of the underlying data.

5. Missing data for Argentina, Brazil, Malaysia and Russia.

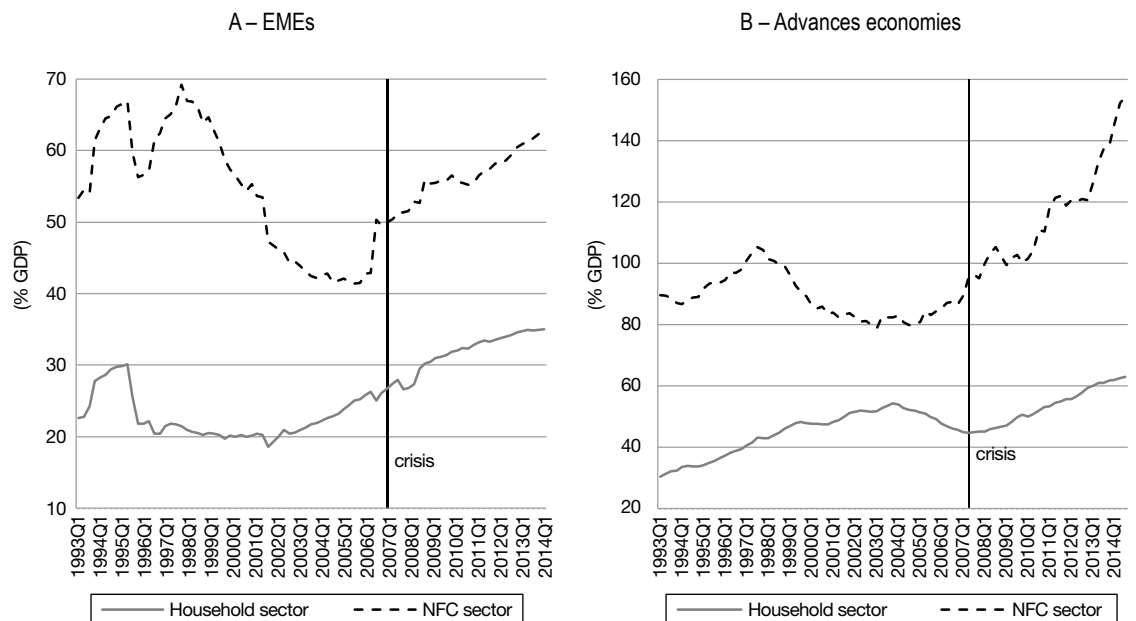
6. While the expansion of corporate bond markets presents overall benefits for the funding of the real economy through a diversification of the ways of financing even when the banking sectors are distressed (FSB, 2015), it equally has the drawback of firms being exposed to more volatile funding conditions.

Figure I
Developments in Private NFS Borrowing (% of GDP): Emerging Market vs. Advanced Economies



Note: Crisis (vertical line) corresponds to 2007-Q2.
 Sources: BIS and national sources data; author's calculations.

Figure II
Developments in Private NFS Borrowing by Sector (% of GDP): Emerging Market vs. Advanced Economies



Note: Crisis (vertical line) corresponds to 2007-Q2.
 Sources: BIS and national sources data; author's calculations.

feature is that of highly predominant domestic securities issuance (IMF, 2015a) of different magnitudes across EMEs, sign of different degrees of development of their financial markets; in Asia-Pacific NFC domestic issuances

are 6 times larger than in Latin America and 21 times larger compared to Emerging Europe. In addition, in Emerging Asia the corporate sector has been the largest issuer of foreign currency bonds in recent years (Acharya *et al.*,

2015). While NFCs have become highly exposed to interest rate and exchange rate risks through the issuance of debt securities in both foreign and domestic currencies, according to CGFS (2014), the main relevant issues for EME corporates are the interest rate and roll-over risks.

Brief Overview of Literature

My paper adds to the recent work on NFC borrowing in EMEs. It has the particularity of analyzing not only the domestic but also the cross-border bank lending of the private NFS. I therefore make reference, in this section, to some existing recent studies on private sector indebtedness and cross-border bank lending in EMEs, as well as on credit growth drivers.

On Private Sector Indebtedness

Chui *et al.* (2014) have examined the risks related to EME corporate balance sheets and their possible implications for the broader financial system, underlining the difficulty

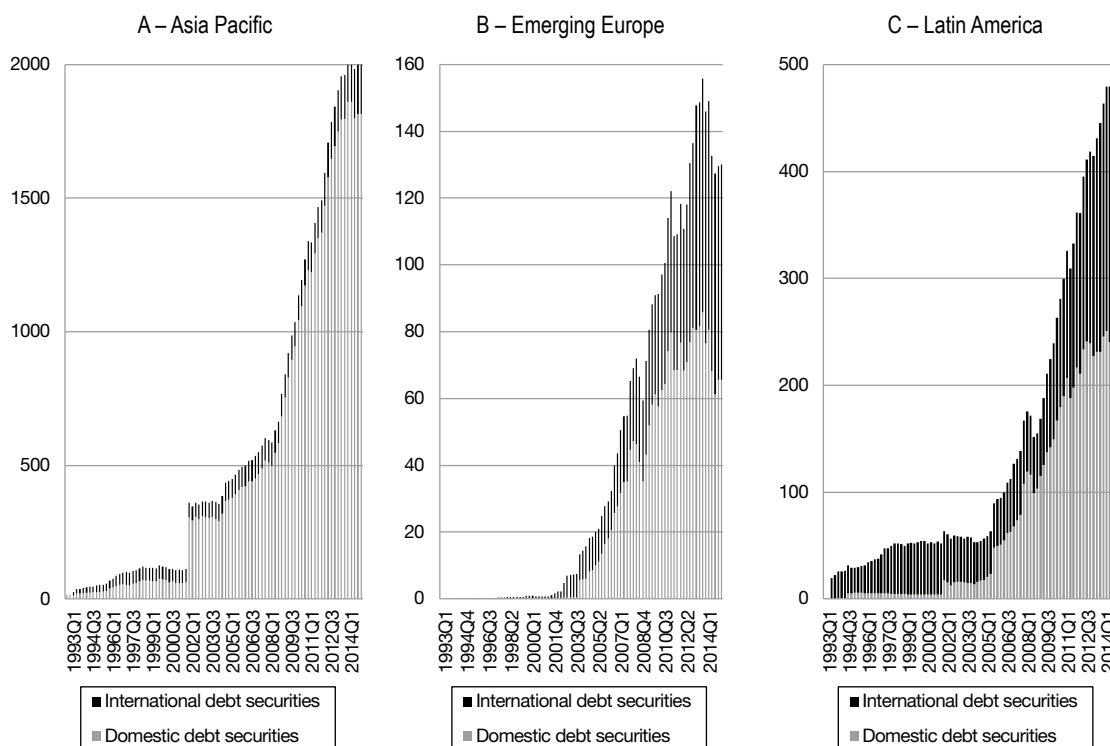
of assessing EME corporate vulnerabilities, especially in a cross-country context.⁷ They illustrate two channels as potential scope for spillovers: the liability-side exposures (i.e. high exposure of local institutions relying on corporate deposits for their wholesale funding); and the asset-side exposures (i.e. direct credit exposures of banks to corporates via lending and bond holdings).

Avdjiev *et al.* (2014) have presented evidence of an increase in capital flows to EMEs associated with NFC over the past few years through three channels: a surge in transfers between firms’ headquarters and their offshore affiliates; a significant increase in “non-bank” trade credit flows; and a considerable increase of the amount of external loan and deposit financing provided by non-banks.

Acharya *et al.* (2015) have published a report on financial risks associated with the increase in corporate debt in EMEs. They concluded on the need of ensuring that financial intermediaries

7. Internationally comparable measures of corporate sector leverage are hard to compute due to the lack of financial accounts data at the national level for many EMEs.

Figure III
Debt Securities Issued by NFC Over the Period 1993-Q1 - 2015-Q2 (Amounts Outstanding, USD Billions)



Sources: BIS securities statistics; author’s calculations.

are sufficiently resilient to withstand a substantial shock to their capital and liquidity.

The IMF (2015a) has addressed the issue of corporate leverage in EMEs, with a focus on NFC leverage, bond issuance and spreads, through an analysis over the period 2004-2014, based on country, bond and firm-specific indicators.⁸ Three main findings are that, in recent years: the role of firm and country-specific characteristics in explaining corporate leverage growth has diminished, while global factors played a larger role; the increase in leverage took place mainly in more cyclical sectors (the construction sector benefiting of the highest increase); the issuance of bonds by emerging market firms took place in better terms (lower yields and longer maturities) triggered by favorable financial conditions.

The IMF (2015b) has analyzed the balance sheet risks in emerging market corporates using annual firm level balance sheet information⁹ from 16 EMEs. A sensitivity analysis was conducted in a stressed scenario of a 30 percent increase in borrowing costs, a 20 percent decline in earnings and an exchange rate depreciation of 30 percent against the dollar. The combination of the three shocks was found to significantly increase debt at risk,¹⁰ especially in countries with high shares of external debt and low natural hedges. Moreover, shocks to earnings, interest rate and exchange rates were found to affect commodities related firms and state owned enterprises. In addition, a 15 percent default on total debt at risk owed to banks would lead to an important deterioration of banks' buffers in the large majority of countries in the sample.

On Cross-Border Bank Lending in EMEs

The most exhaustive data on national banking systems' cross-border positions is provided by the BIS international banking statistics.

McGuire and Tarashev (2008) have studied the way the health of individual national banking systems affected foreign lending to EMEs, with the use of BIS consolidated data. They show that in the past, negative shocks to bank health were associated with slowdowns in credit growth. McGuire and von Peter (2009) have used the BIS international banking statistics (both consolidated and locational) to identify cross-country and counterparty funding patterns for the largest banking systems and

to assess the causes of US shortage during the critical phases of the crisis.

Takáts (2010) has used the BIS locational data for analyzing the key drivers of cross-border bank lending to EMEs. The sharp drop in cross-border bank lending during the financial crisis was shown to be due to both demand and supply factors, with a stronger impact for the latter. Avdjiev *et al.* (2012) have combined the locational data by residence with the consolidated data and showed that the 2011 contraction in cross-border bank lending to EMEs was largely connected to the deterioration of the euro area banks' health. Avdjiev and Takáts (2014) have analyzed the drivers of the sharp slowdown in cross-border bank lending to EMEs during the tapering tantrum. By using the BIS newly available data,¹¹ they showed that EMEs' specific factors explained the bulk of the variation of the slowdown across lender-borrower pairs.

On Drivers of Credit Growth

Mendoza and Terrones (2008) have proposed a methodology for measuring credit booms in emerging and industrial economies over the past four decades. Based on macro data, they found a systematic relationship between credit booms and economic expansions, rising asset prices, real appreciations, widening external deficits and managed exchange rates. As for micro data, a strong association was shown between credit booms and firm-level measures of leverage, firm values, external financing, and bank-level indicators of banking fragility. According to their findings, credit booms and the related macro and micro fluctuations are larger in EMEs, particularly in the nontradables sector. They also show that not all credit booms end in financial crises, but most EMEs crises were associated with credit booms, and credit booms in EMEs are often preceded by large capital inflows.

Elekdag and Wu (2011) have proceeded to a comprehensive event study focusing on

8. Thomson Reuters Worldscope (for publicly listed firms) and Orbis (for unlisted small and medium-sized enterprises).

9. The sample consisted of 40,000 firms and included public and private, large and small companies. The coverage of firms' total assets was around two thirds of total GDP of the sample countries. The dataset used was Orbis.

10. Debt at risk is defined as the debt of firms with interest coverage ratios below 1.5.

11. The new data (i.e. the recently implemented Stage 1 Enhancements to the BIS international banking statistics) contain three dimensions: the nationality of the lending bank, the location of the borrower and the currency composition of the claims.

99 credit booms, 60 of which originated in EMEs. Their results show that: loose monetary policy stance has contributed to the build-up of credit booms; domestic policy rates were low during the pre-peak phase of credit booms and fueled macroeconomic and financial imbalances; for EMEs, despite the increasing importance of external factors (such as global liquidity conditions), domestic factors (especially monetary policy) were found to be important drivers of real credit growth.

Bruno and Shin (2014) have investigated the global factors associated with bank capital flows through a theoretical model of the international banking system where global banks interact with local banks; the bank leverage cycle is shown to be a key driver of the transmission of financial conditions across borders, through banking sector capital flows. Moreover, local currency appreciation was shown to be associated with higher leverage of the banking sector. The key predictions of their model were supported by a panel study on 46 countries (both developed and EMEs) with the use of BIS locational banking statistics.

Finally, Igan and Tan (2015) have investigated the association between capital inflows and credit growth by exploiting a granular panel dataset¹² of 33 countries over the period 1980-2011. Non-FDI capital inflows were found to boost credit growth and increase the likelihood of credit booms in both household and corporate sectors. According to their findings, for household credit growth, the composition of capital inflows appeared to be more important than financial system characteristics. In contrast, for corporate credit growth, both the composition and the financial system were found to matter. In addition, regardless of sectors and financial systems, net other inflows were found to be always linked to rapid credit growth. These findings were confirmed by firm-level data, hinting at a causal link: net other inflows were related to more rapid credit growth for firms relying more heavily on external financing. Further explorations on how capital flows translated into more credit has shown that both demand and supply side factors played a role.

Empirical Exercise

Data

The analysis is undertaken for a sample of 15 emerging economies (Argentina, Brazil,

China, Czech Republic, Hungary, Korea, India, Indonesia, Malaysia, Mexico, Poland, Russia, Thailand, Turkey and South Africa)¹³ over the period 1993-Q1-2014-Q3, with quarterly data. The definitions and the sources of indicators, as well as the summary of the statistics related to each indicator are presented in Appendix (Tables A-1 and A-2).

Estimating the Drivers of Private NFS Borrowing in EMEs

The regression estimated is similar to bank capital flows regressions in Bruno and Shin (2014):

$$\Delta L_{i,t} = \alpha + \beta_j Local Factor(i, j)_{t-1} + \gamma_w Global Factor(w)_{t-1} + \delta_i + \theta_t + \varepsilon_{i,t} \quad (1)$$

where

- $\Delta L_{i,t}$ is the growth in private NFS borrowing in country i and in quarter t , as given by the quarterly growth rates in the outstanding amount of private NFS borrowing (both from all sectors and from domestic banks);

- $Local Factor(i, j)_{t-1}$ is the local factor j in country i . Here I consider several indicators: the real GDP growth rate, the nominal exchange rate against the US dollar, the funding conditions (i.e. the monetary policy rate), the macroeconomic conditions (some common-used indicators for assessing macroeconomic vulnerabilities are considered, namely the unemployment rate and the external debt ratio¹⁴), bank-specific characteristics (indicators used for assessing financial vulnerabilities, namely the ratio of non-performing loans (NPLs) to total loans and the quarterly difference of size of the banking sector¹⁵ are considered);

- $Global Factor(w)_{t-1}$ is the global factor w that encompass the global financial market conditions and the US monetary policy stance.

12. Capital inflows were broken down into FDI, portfolio and other categories. Moreover, a distinction was made between credit to the household sector and to the corporate sector.

13. The reason behind the choice of the sample is that the BIS database on total credit and domestic bank credit to private NFS covers only 17 EMEs. The two additional countries are Hong Kong SAR and Singapore. We choose not to include them in the analysis given their specific features, as financial centers.

14. I use the quarterly difference of the external debt to GDP ratio. In a previous version, the current account balance has been taken into account. Given the rather scarce availability of this indicator, it was dropped out.

15. The size of the banking sector is defined as the ratio of total assets to GDP.

These variables are introduced in the regression in levels for the US monetary policy rate and, respectively, in difference for VIX;

$-\delta_i$ are country-specific fixed effects, θ_t are time-specific fixed effects, and $\varepsilon_{i,t}$ is the error term.

In addition, a dummy variable ($crisis_{07}$) is included in equation (1) to consider the occurrence of the 2007 global financial crisis. Given the use of quarterly data in the analysis, I apply the Brunnermeier (2009) definition;¹⁶ thus, $crisis_{07}$ takes the value 1 over the period 2007-Q2 - 2009-Q2 and 0 otherwise.

Top and bottom 1% observations of all variables are winsorized so as to avoid the problems caused by the presence of outliers.

Before proceeding to the empirical estimations, I test the stationarity of the variables in order to choose the right specification model.¹⁷ I compute the Fisher Augmented Dickey Fuller (ADF) (Choi, 2001) panel data unit root tests.¹⁸ According to the results (see Table A-3 in Appendix), nominal exchange rate against the US dollar, total assets over GDP, the ratio of external debt over GDP and the global financial market conditions (VIX) follow I(1) processes and their first difference forms follow I(0) processes. As a consequence, I use these variables in first difference, while the others are used in levels.

The feasible general least squares (FGLS) technique is applied to account for both the heteroskedastic error structure between panels and the panel-specific autocorrelation.¹⁹ According to the Hausman test, computed to differentiate between random and fixed effects, the fixed effects model is the most appropriate. As a robustness check exercise, I perform the two-step efficient generalized method of moments estimator.²⁰ In addition, in order to mitigate reverse causality problems, all the explicative variables are lagged by one quarter.

Results

As mentioned before, private NFS borrowing is captured by two different indicators: private NFS borrowing from domestic banks and, respectively, from all sectors (banks and non-banks), in all currencies. A third dependent variable is used to consider that private NFS

equally borrows from abroad; it takes the form of international claims vis-à-vis private NFS, proxied by the international claims of BIS reporting bank vis-à-vis the non-bank sector.

I consider important assessing lending to domestic economy (here private NFS) provided by foreign banks from abroad. Indeed, the assessment of a country's domestic credit conditions should include credit provided cross-border and special attention should be given to the monitoring of cross-border flows, from the point of view of recipient countries and of the global system as a whole (Cerutti, 2013; Hills & Hoggarth, 2013; Schoenmaker & Wagner, 2013).

In the BIS data, the "non-bank sector" makes reference to NFCs, households and non-bank financial institutions. Given that, in EMEs, claims on non-bank financial institutions are less than 3% of cross-border claims (Avdjiev *et al.*, 2015), this variable could indeed be used as a proxy for international claims vis-à-vis private NFS. Another issue related to BIS international banking statistics is that international claims represent the sum of consolidated cross-border claims in all currencies and of local claims in foreign currencies. It would have been interesting to use only the cross-border component so as to gauge solely borrowing from abroad; unfortunately, this split of data (cross-border versus local claims in foreign currencies) is unavailable.

In what follows, I estimate the equation (1) for each of the three dependent variables and seek to detect whether the determining factors have a different impact depending on whether private NFS borrows domestically or abroad. The results are presented in Tables (1) to (3) below.

16. Fratzscher (2012) and Brunnermeier (2009) provided valuable evidence in this respect. The 2007 crisis went from 7 August 2007 till 15 March 2009 according to Fratzscher (2012), and, respectively, from the 2nd quarter of 2007 till the 2nd quarter of 2009 according to Brunnermeier (2009).

17. I thank one anonymous referee for underlying this issue.

18. These tests do not require strongly balanced data; they conduct unit-root tests for each panel individually, and then combine the p-values from these tests to produce an overall test.

19. The overall and inter-individuals heteroscedasticity, as well as the presence of contemporaneous correlation between individuals and the autocorrelation within have been tested. The presence of both heteroscedasticity and panel-specific autocorrelation that were revealed by the tests has been corrected for with the FGLS method (Wooldridge, 2002; Ouellet, 2005).

20. I thank one anonymous referee for pointing me in this direction. I control for endogeneity issues by using the instrumental variables method and apply the panel data twostep efficient GMM estimator. The efficiency gains of the GMM estimator relative to the traditional IV/2SLS estimator derive from the use of the optimal weighting matrix, the overidentifying restrictions of the model, and the relaxation of the i.i.d. assumption.

Real GDP is used as a proxy for credit demand. Its coefficient is statistically significant and positive, as expected. Stronger GDP growth in a given EME implies higher borrowing for the private NFS from domestic banks (see Table 1), from all sectors including non-banks (see Table 2) and equally higher cross-border borrowing (see Table 3). Indeed, higher levels of output require more credit, including from all sources. This result is in line with Avdjiev *et al.* (2012). According to the findings, on average, a 1% increase in real GDP growth will generate an increase in NFS borrowing from domestic banks between 0.26 and 0.35 percent (see Table 1), between 0.18 and 0.27 percent for NFS borrowing

from all sectors (see Table 2) and, respectively between 0.34 and 0.54 percent for private NFS borrowing from abroad (see Table 3).

Another indicator of country-specific macro-economic conditions is the nominal exchange rate against the US dollar. As expected, the appreciation of the US dollar is found to be negatively related to cross-border bank lending. As a matter of fact, the dollar appreciation increases the value of dollar debt and, as a consequence, it triggers a decrease in the indebtedness capacity of private NFS. It should be equally mentioned that, in the case of foreign currency borrowing, exchange rate depreciation will engender rollover risks for

Table 1
The Drivers of Private NFS Borrowing from Domestic Banks in EMEs

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local factors							
GDP growth rate _{<i>t-1</i>}	0.288*** (0.032)	0.348*** (0.031)	0.342*** (0.032)	0.353*** (0.032)	0.266*** (0.029)	0.306*** (0.038)	0.328*** (0.034)
ΔNominal exchange rate _{<i>t-1</i>}	0.002*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.008*** (0.003)	0.005*** (0.002)	0.006*** (0.001)
<i>Funding conditions</i>							
Monetary policy rate _{<i>t-1</i>}	0.011 (0.023)	-0.007 (0.029)	0.013 (0.023)	-0.006 (0.028)	-0.076 (0.050)	0.004 (0.035)	-0.030 (0.029)
<i>Macroeconomic conditions</i>							
Unemployment rate _{<i>t-1</i>}	-0.15** (0.070)	-0.141** (0.070)		-0.143** (0.069)	0.230*** (0.087)	-0.138* (0.080)	-0.166** (0.068)
Δ External debt (% GDP) _{<i>t-1</i>}						-0.088** (0.040)	
<i>Banking characteristics</i>							
Δ Total assets (% GDP)		0.006 (0.010)	0.008 (0.010)	0.006 (0.009)			0.004 (0.009)
NPLs _{<i>t-1</i>}					-0.231*** (0.045)		
Global factors							
Global funding conditions (Δ VIX)				-0.011 (0.008)	0.003 (0.008)	-0.009 (0.012)	-0.011 (0.008)
US monetary policy rate _{<i>t-1</i>}							0.201*** (0.063)
Dummy 2007 crisis	0.667** (0.260)	0.793*** (0.236)	0.735*** (0.244)	0.856*** (0.242)	0.319 (0.263)	1.270*** (0.303)	0.610** (0.252)
Observations	679	622	729	622	360	465	622
Number of country	15	15	15	15	14	13	15
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Cross-sectional time-series FGLS regression, correcting for heteroscedasticity across panels and autocorrelation within panels. The dependent variable is the quarterly growth in the stock of private NFS borrowing from domestic banks. Standard errors in parentheses. *, **, *** denotes significance at 10%, 5%, 1% level. External debt data missing for China and South Africa. NPLs data missing for China. All regressions include a constant and country dummies that are not reported.
Sources: See Table A-1; author's estimations.

NFC.²¹ Thus, one unit increase in the nominal exchange rate against the US dollar (i.e. a depreciation of domestic currencies) generates a decrease in cross-border borrowing by 0.07 percent (see Table 3). As regards borrowing from domestic banks and from all sectors, the exchange rate depreciation is found to have a positive and significant effect; a one unit increase in the nominal exchange rate is associated to a relatively low increase in the borrowing from domestic banks, of 0.002 to 0.008 percent (Table 1), as well as in the borrowing from all sectors, of 0.005 to 0.008 percent (see Table 2).

The funding conditions are proxied by the monetary policy rate. Usually, its increase, signal of more restrictive funding conditions, is associated with a reduction in private NFS borrowing. According to my findings, an increase in monetary policy rate does not have a statistically significant impact on NFS borrowing, be it from domestic banks, from all sectors or cross-border. In only one equation this indicator is statistically significant: a 1% increase in the monetary policy rate triggers a

21. Data on currency composition of cross-border bank lending is unavailable.

Table 2
The Drivers of Private NFS Borrowing from All Sectors, in All Currencies in EMEs

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local factors							
GDP growth rate _{t-1}	0.195*** (0.032)	0.252*** (0.034)	0.273*** (0.034)	0.254*** (0.034)	0.220*** (0.034)	0.184*** (0.039)	0.239*** (0.037)
ΔNominal exchange rate _{t-1}	0.005*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.009*** (0.003)	0.008*** (0.002)	0.008*** (0.001)
<i>Funding conditions</i>							
Monetary policy rate _{t-1}	0.047** (0.023)	0.007 (0.028)	0.034 (0.023)	0.008 (0.028)	-0.061 (0.059)	0.036 (0.034)	-0.007 (0.029)
<i>Macroeconomic conditions</i>							
Unemployment rate _{t-1}	-0.27*** (0.072)	-0.252*** (0.075)		-0.252*** (0.075)	0.166 (0.104)	-0.265*** (0.087)	-0.262*** (0.074)
Δ External debt (% GDP) _{t-1}						-0.015 (0.045)	
<i>Banking characteristics</i>							
Δ Total assets (% GDP)		0.017* (0.009)	0.016* (0.009)	0.017* (0.009)			0.016* (0.009)
NPLs _{t-1}					-0.239*** (0.048)		
Global factors							
Global funding conditions (Δ VIX)				-0.002 (0.008)	0.011 (0.009)	-0.007 (0.012)	-0.002 (0.008)
US monetary policy rate _{t-1}							0.131** (0.063)
Dummy 2007 crisis	0.739*** (0.271)	0.802*** (0.244)	0.924*** (0.254)	0.822*** (0.249)	0.343 (0.291)	1.126*** (0.336)	0.682*** (0.261)
Observations	678	622	730	622	360	465	622
Number of country	15	15	15	15	14	13	15
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Cross-sectional time-series FGLS regression, correcting for heteroscedasticity across panels and autocorrelation within panels. The dependent variable is the quarterly growth in the stock of private NFS borrowing from all sectors (banks and non-banks). Standard errors in parentheses. *, **, *** denotes significance at 10%, 5%, 1% level. External debt data missing for China and South Africa. NPLs data missing for China. All regressions include a constant and country dummies that are not reported.

Sources: See Table A-1; author's estimations.

slight increase, of 0.04 percent in NFS borrowing from all sectors (Table 2, column 1). This positive effect is equally found when using the two-step GMM estimator (see Table A-6 in the Appendix).

Domestic macroeconomic vulnerabilities are equally influencing the borrowing behavior of private NFS. Unemployment is found to present a statistically significant and negative coefficient, as the higher the share of unoccupied population, the lower is their demand and consumption and, therefore, the lower will be their borrowing. Thus, a 1% increase

in unemployment triggers a decrease in borrowing of 0.13 to 0.16 percent when coming from domestic banks (cf. Table 1), of 0.25 to 0.27 percent when coming from all sectors (see Table 2) and, respectively, of 0.34 percent in the case of cross-border borrowing (see Table 3).

Additionally, a negative link is found between external debt and borrowing from domestic banks (Table 1), with a 1% increase in external debt being associated to a decrease of 0.08 percent in NFS borrowing. In addition, in the case of cross-border borrowing (Table 3), a 1% increase in external debt is associated with

Table 3
The Drivers of International Claims of BIS Reporting Banks Vis-à-Vis the Private NFS in EMEs

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local factors							
GDP growth rate _{<i>t-1</i>}	0.371*** (0.078)	0.509*** (0.082)	0.543*** (0.078)	0.521*** (0.083)	0.346*** (0.092)	0.442*** (0.091)	0.368*** (0.086)
ΔNominal exchange rate _{<i>t-1</i>}	0.001 (0.001)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	-0.069*** (0.011)	-0.007 (0.004)	0.002 (0.002)
<i>Funding conditions</i>							
Monetary policy rate _{<i>t-1</i>}	0.068 (0.043)	0.015 (0.052)	0.042 (0.041)	0.016 (0.052)	0.215 (0.178)	0.064 (0.053)	-0.063 (0.049)
<i>Macroeconomic conditions</i>							
Unemployment rate _{<i>t-1</i>}	-0.347** (0.174)	-0.236 (0.175)		-0.237 (0.175)	0.045 (0.313)	0.079 (0.189)	-0.272 (0.166)
Δ External debt (% GDP) _{<i>t-1</i>}						0.669*** (0.097)	
<i>Banking characteristics</i>							
Δ Total assets (% GDP)		0.337*** (0.039)	0.307*** (0.037)	0.335*** (0.039)			0.322*** (0.038)
NPLs _{<i>t-1</i>}					0.287** (0.146)		
Global factors							
Global funding conditions (Δ VIX)				-0.025 (0.029)	-0.058* (0.032)	-0.026 (0.033)	-0.027 (0.029)
US monetary policy rate _{<i>t-1</i>}							0.753*** (0.155)
Dummy 2007 crisis	0.198 (0.689)	0.189 (0.650)	0.385 (0.646)	0.304 (0.662)	-0.422 (0.923)	1.394* (0.772)	-0.551 (0.673)
Observations	675	618	726	618	358	462	618
Number of country	15	15	15	15	14	13	15
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Cross-sectional time-series FGLS regression, correcting for heteroscedasticity across panels and autocorrelation within panels. The dependent variable is the quarterly growth in the stock of international claims of BIS reporting banks vis-à-vis private NFS. Standard errors in parentheses. *, **, *** denotes significance at 10%, 5%, 1% level. External debt data missing for China and South Africa. NPLs data missing for China. All regressions include a constant and country dummies that are not reported.

Sources: See Table A-1; author's estimations.

an increase in NFS borrowing from abroad of 0.67 percent. External debt is found to have no statistically significant impact on borrowing from all sectors. In light of our findings, external debt in EMEs looks like being financed abroad.

The performance of the banking system is proxied by each national banking system's size and the ratio of NPLs to total loans. The ratio of NPLs to total loans is a backward-looking measure of bank risk that captures the asset risk of banks. According to the findings, a 1% increase in NPLs ratio, signaling the deterioration in banks' health, is associated with slower credit growth to EMEs, i.e. a decrease of 0.23 percent in NFS borrowing from domestic banks (cf. Table 1) and from all sectors (cf. Table 2) and, respectively, of 0.28 percent in cross-border borrowing (cf. Table 3).²² In addition, the increase in NPLs generates more losses associated with loans to firms and securities issued by firms, thus impairing the banking system assets.

As for the size of the banking sector, the results show a statistically significant and positive coefficient, signaling that the larger the change in the size of banking system in terms of GDP, the higher would be borrowing of private NFS be it from all sectors or from cross-border. Thus, a 1% increase in total assets over GDP triggers an increase in NFS borrowing of 0.016 to 0.017 percent if the borrowing comes from all sectors (cf. Table 2), and, respectively, of 0.30 to 0.33 percent if the borrowing comes from abroad (cf. Table 3). No statistically significant impact is found for borrowing from domestic banks.

The global financial market volatility is proxied by the quarterly difference in volatility of S&P 500 financial index (VIX, which is usually used as a global supply factor). Volatility tends to be higher in periods of stress, being negatively related to credit supply. Lower volatility in financial asset prices reduce banks' measured market risk and the amount of capital they need to hold to meet regulatory requirements; thus, lower volatility is expected to be associated with higher credit supply. According to the findings, the higher the volatility on the global financial market, the lower the borrowing of private NFS from abroad. A one unit increase in VIX will trigger a decrease of 0.05 percent in cross-border NFS borrowing (cf. Table 3). In the case of domestic borrowing and of borrowing from all sectors, the coefficient of VIX

is not statically significant even though it presents the expected negative sign.

Another global factor taken into account is the US monetary policy. The US monetary policy stance has indeed global implications; its changes will affect liquidity conditions in global financial markets through changes in term premiums, exchange rates and risk aversion. According to my findings, the US monetary policy rate change affects only the three forms of borrowing of private NFS). Thus, a 1% increase in the US monetary policy rate triggers a 0.2 percent increase in domestic borrowing (cf. Table 1), a 0.13 percent increase in borrowing from all sectors (cf. Table 2) and, respectively, a larger increase, of 0.75 percent in cross-border borrowing (cf. Table 3).

The occurrence of the 2007 global financial crisis has been equally controlled for. The results show that private NFS borrowing was not affected by the 2007 crisis. On the contrary, over the period 2007-Q2 - 2009-Q2, borrowing from domestic banks has increased on average by 0.61 to 1.27 percent (cf. Table 1), while borrowing from all sectors has increased on average by 0.68 to 1.12 percent (cf. Table 2). As regards cross-border borrowing, the 2007 crisis seems not to have had any impact. The robustness of the results is checked by applying the two-step GMM estimator (see Tables A-4 to A-6 in the Appendix).

Overall, as shown by the results, there is no difference in the key drivers when NFS borrows domestically from banks or from all sectors. It should be however stressed that, according to my findings, global factors like the change in the global funding conditions have an impact only on cross-border bank borrowing (cf. Table 3). Moreover, cross-border borrowing from BIS reporting banks is found not to be affected by domestic factors like domestic funding conditions and unemployment. The analysis presents some limitations: First, it focusses on the broad category of "private NFS" given that the distinction between sectors (households and NFCs, respectively) is not available for all the countries in the sample. Another limitation is that of not considering the currency composition of borrowing (decomposition that is not available in the BIS data). However, the findings presented here are in line with Cetorelli and Goldberg (2012),

22. *These findings should be treated with caution given the rather scarce availability of data on NPLs.*

according to which lending by global banks is likely to be more insulated from domestic liquidity shocks, and Cerutti *et al.* (2015) that have illustrated the sensitivity to push factors for countries relying on global banks.

* *
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In this paper I assess the drivers of private NFS borrowing in EMEs, through a panel data analysis carried out with quarterly data for a sample of 15 economies over the period 1993-Q1 - 2014-Q3. It is important to improve our understanding of the role played by domestic and global factors in its recent dynamics, especially from the perspective of financial vulnerabilities. In addition, it is paramount to assess the risks posed by the increased indebtedness of the private NFS and the consequences for a country's financial system and economy in case these risks materialize.

According to my findings, the increase in private NFS borrowing in EMEs has been associated, over the period 1993 to 2014, with an increase in credit demand, real currency appreciation, reduced macroeconomic vulnerabilities, a healthy and large domestic banking system. As regards global factors, the appreciation of the US dollar, the high global financial market volatility and the US monetary policy

stance are found to have had an influence on private NFS borrowing in EME.

Once these risks and spillovers detected, what should be done from a policy point of view? To date, the existing policy responses are conceived and implemented at the domestic level and take the form, among others, of fiscal policy measures and macroprudential tools. As regards the fiscal policy measures, in the presence of financial frictions in the corporate sector, the governments will limit the amount of tax revenue that can be raised domestically.²³ As far as macroprudential tools are concerned, instruments expected to mitigate and prevent excessive credit growth and leverage are the most appropriate (i.e. countercyclical capital buffers, sectoral capital requirements, macroprudential leverage ratio, loan-to-value requirements, or loan-to-income/debt service-to-income requirements). In addition to policy responses, an important aspect that should not be ignored is that of cross-border spillovers. In this respect, a key issue is the need of coordinating the policies implemented at the national level, so as to consider their potential spillover effects. □

23. *The two-way contagion channel between government and firms should be kept in mind. The probability of corporations default could be amplified by higher taxes set by the government to respond to a debt crisis, thus increasing firms' borrowing costs. Moreover, the ability of the government to issue debt on international financial markets will be affected by financial frictions in the corporate sector, thus lowering the level of sovereign debt and making it more sustainable.*

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Table A-1
Data Sources

Variable	Sources	Definition
NFS borrowing from domestic banks	BIS Long series on total credit and domestic bank credit to the private nonfinancial sector	Private non-financial sector borrowing from banks, domestic; end of period, adjusted for breaks; billions, local currency.
NFS borrowing from all sectors	BIS Long series on total credit and domestic bank credit to the private nonfinancial sector	Private non-financial sector borrowing from all sectors; end of period, adjusted for breaks; billions, local currency.
International claims vis-à-vis non-bank private sector of country <i>i</i>	BIS Consolidated Banking Statistics (Table 9A: Consolidated claims of reporting banks, immediate borrower basis)	International claims vis-à-vis the non-bank private sector of country <i>i</i> ; end of period outstanding amounts; millions, USD.
GDP growth rate	Datastream / National sources	Real gross domestic product growth rate, %.
Nominal exchange rate	Datastream, IMF-IFS/Reuters	National currency unit to USD - market rate; end of period
Monetary policy rate	Datastream / National sources	Central bank policy rate; end of period percent per annum. The target rate used by the central bank to conduct monetary policy. The monetary policy instrument varies across countries.
Unemployment rate	Datastream / IMF-IFS	The concept of unemployment conforms to the recommendations adopted by the ILO: Thirteenth International Conference of Labor Statisticians, Geneva, 1982. For the euro area, EUROSTAT provides the data.
External debt	World Bank / National Sources	Gross external debt (% of GDP).
Size of the banking system	Authors calculations, based on national sources.	The ratio of total assets of the banking system to GDP, %.
NPLs	National sources, IMF Financial Stability Indicators	Non-performing loans (overall) / Total loans; %.
Global financial market volatility	Datastream / Chicago Board Options Exchange (CBOE)	CBOE SPX volatility VIX; price index.
US monetary policy rate	Datastream/ National sources	US Central bank policy rate; end of period; percent per annum.

Notes: NFS stands for non-financial sector, GDP for gross domestic product, NPL for non-performing loans, US for United States. IMF-IFS refers to International Financial Statistics of the International Monetary Fund.

Table A-2
Summary Statistics for Key Variables

Variables	No. of obs.	Mean	St. dev.	Min	Max
NFS borrowing from domestic banks (quarterly growth)	1,389	4.180	4.102	-5.730	22.959
NFS borrowing from all sectors (quarterly growth)	1,388	4.212	4.068	-6.213	21.320
International claims of BIS banks vis-à-vis private NFS (quarterly growth)	1,430	3.027	6.959	-15.209	27.428
GDP growth rate (level)	1,035	4.137	4.005	-9.9	12.6
Nominal exchange rate (quarterly difference)	1,443	6.367	146.214	-1959	3675
Monetary policy rate (level)	1,310	11.131	12.429	.5	76.93
Unemployment rate (level)	1,015	8.203	5.280	.9	26.4
External debt (% GDP) (quarterly difference)	615	.15	2.84	-15.969	22.830
Total assets (% GDP) (quarterly difference)	991	.669	5.738	-35.388	30.262
Non-performing loans (% total loans) (level)	457	5.286	4.593	.570	37.01
Global financial market volatility (VIX) (quarterly difference)	1,455	-.120	7.073	-22.05	29.58
US monetary policy rate (level)	1,500	3.345	2.380	.25	8.25

Table A-3
 Fisher ADF Panel Data Unit Root Test Results

Variables	Level	Difference
GDP growth rate	0.023	-
Nominal exchange rate	0.972	0.000
Monetary policy rate	0.000	-
Unemployment rate	0.000	-
External debt (% GDP)	0.308	0.000
Total assets (% GDP)	0.865	0.000
Non-performing loans (% total loans)	0.000	-
Global financial market volatility (VIX)	0.959	0.000
US monetary policy rate	0.000	-

Notes: H0: All panels contain a unit root. Ha: At least one panel is stationary. Observation: p-values reported.

 Table A-4
 The drivers of private NFS borrowing from domestic banks in EMEs

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local factors							
GDP growth rate _{t-1}	0.457*** (0.104)	0.554*** (0.095)	0.625*** (0.091)	0.553*** (0.097)	0.313*** (0.092)	0.460*** (0.105)	0.482*** (0.109)
ΔNominal exchange rate _{t-1}	0.005*** (0.001)	0.006*** (0.002)	0.006*** (0.002)	0.006*** (0.002)	0.014** (0.006)	0.007*** (0.002)	0.006*** (0.002)
<i>Funding conditions</i>							
Monetary policy rate _{t-1}	0.079* (0.042)	0.033 (0.048)	0.051 (0.044)	0.036 (0.048)	0.036 (0.086)	0.068 (0.051)	0.023 (0.052)
<i>Macroeconomic conditions</i>							
Unemployment rate _{t-1}	-0.069 (0.093)	-0.134 (0.082)		-0.133 (0.082)	0.218* (0.129)	-0.132 (0.105)	-0.158* (0.087)
Δ External debt (% GDP) _{t-1}						0.008 (0.053)	
<i>Banking characteristics</i>							
Δ Total assets (% GDP)		-0.106 (0.073)	-0.138 (0.087)	-0.109 (0.074)			-0.127* (0.072)
NPLs _{t-1}					-0.249*** (0.059)		
Global factors							
Global funding conditions (Δ VIX)				-0.027* (0.014)	0.001 (0.013)	-0.009 (0.017)	-0.023 (0.014)
US monetary policy rate _{t-1}							0.046 (0.106)
Dummy 2007 crisis	1.124*** (0.316)	1.253*** (0.317)	1.096*** (0.318)	1.377*** (0.318)	-0.029 (0.385)	1.387*** (0.366)	1.270*** (0.378)
Underidentification ^(a)	0.000	0.005	0.008	0.006	0.000	0.000	0.003
Sargan ^(b)	0.108	0.108	0.124	0.108	0.469	0.101	0.169
Endogeneity ^(c)	0.073	0.043	0.006	0.049	0.106	0.046	0.095
Observations	616	565	644	565	336	431	565
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Panel data two-step efficient generalized method of moments (GMM) estimator. The dependent variable is the quarterly growth in the stock of private NFS borrowing from domestic banks. Standard errors in parentheses. *, **, *** denotes significance at 10%, 5%, 1% level. External debt data missing for China and South Africa. NPLs data missing for China. All regressions include a constant and country dummies that are not reported. (a) p-value corresponding to the Kleibergen-Paap (2006) rk LM statistic. A rejection of the null indicates that the matrix is full column rank, i.e., the model is identified.

(b) The joint null hypothesis is that the instruments are valid instruments and that the excluded instruments are correctly excluded from the estimated equation.

(c) We test the endogeneity of monetary policy rate, GDP growth rate and total assets (% of GDP). Under the null hypothesis, the specified endogenous regressors can actually be treated as exogenous.

Table A-5
The Drivers of Private NFS Borrowing from All Sectors, in All Currencies in EMEs

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local factors							
GDP growth rate _{<i>t-1</i>}	0.406*** (0.107)	0.447*** (0.100)	0.551*** (0.095)	0.450*** (0.101)	0.291*** (0.094)	0.410*** (0.115)	0.371*** (0.115)
ΔNominal exchange rate _{<i>t-1</i>}	0.008*** (0.001)	0.011*** (0.001)	0.011*** (0.001)	0.011*** (0.001)	0.014** (0.005)	0.012*** (0.002)	0.011*** (0.001)
<i>Funding conditions</i>							
Monetary policy rate _{<i>t-1</i>}	0.104*** (0.036)	0.062 (0.040)	0.066* (0.040)	0.061 (0.040)	0.072 (0.103)	0.076 (0.051)	0.039 (0.043)
<i>Macroeconomic conditions</i>							
Unemployment rate _{<i>t-1</i>}	-0.167 (0.109)	-0.224** (0.104)		-0.224** (0.105)	0.132 (0.143)	-0.230* (0.119)	-0.257** (0.104)
Δ External debt (% GDP) _{<i>t-1</i>}						0.035 (0.064)	
<i>Banking characteristics</i>							
Δ Total assets (% GDP)		-0.050 (0.065)	-0.090 (0.082)	-0.054 (0.067)			-0.081 (0.065)
NPLs _{<i>t-1</i>}					-0.256*** (0.069)		
Global factors							
Global funding conditions (Δ VIX)				-0.011 (0.016)	0.013 (0.014)	0.004 (0.017)	-0.006 (0.015)
US monetary policy rate _{<i>t-1</i>}							0.112 (0.107)
Dummy 2007 crisis	1.133*** (0.351)	1.156*** (0.349)	1.173*** (0.358)	1.210*** (0.354)	0.027 (0.462)	1.201*** (0.402)	0.975** (0.418)
Underidentification ^(a)	0.000	0.005	0.011	0.006	0.000	0.000	0.003
Sargan ^(b)	0.105	0.164	0.108	0.101	0.308	0.107	0.161
Endogeneity ^(c)	0.037	0.040	0.043	0.039	0.043	0.036	0.049
Observations	615	564	643	564	336	430	564
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Panel data two-step efficient generalized method of moments (GMM) estimator. The dependent variable is the quarterly growth in the stock of private NFS borrowing from domestic banks. Standard errors in parentheses. *, **, *** denotes significance at 10%, 5%, 1% level. External debt data missing for China and South Africa. NPLs data missing for China. All regressions include a constant and country dummies that are not reported.

(a) p-value corresponding to the Kleibergen-Paap (2006) rk LM statistic. A rejection of the null indicates that the matrix is full column rank, i.e., the model is identified.

(b) The joint null hypothesis is that the instruments are valid instruments and that the excluded instruments are correctly excluded from the estimated equation.

(c) We test the endogeneity of monetary policy rate, GDP growth rate and total assets (% of GDP). Under the null hypothesis, the specified endogenous regressors can actually be treated as exogenous.

Table A-6
The Drivers of International Claims of BIS Reporting Banks Vis-à-Vis the Private NFS in EMEs

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local factors							
GDP growth rate _{<i>t-1</i>}	0.821*** (0.193)	0.821*** (0.158)	0.888*** (0.152)	0.825*** (0.158)	0.960*** (0.172)	0.725*** (0.176)	0.720*** (0.160)
ΔNominal exchange rate _{<i>t-1</i>}	-0.001 (0.002)	-0.002 (0.003)	-0.004 (0.003)	-0.002 (0.003)	-0.065*** (0.020)	-0.012** (0.005)	-0.001 (0.003)
<i>Funding conditions</i>							
Monetary policy rate _{<i>t-1</i>}	-0.066 (0.072)	-0.108 (0.075)	-0.092 (0.074)	-0.109 (0.075)	0.324 (0.218)	-0.058 (0.082)	-0.164** (0.080)
<i>Macroeconomic conditions</i>							
Unemployment rate _{<i>t-1</i>}	-0.157 (0.218)	-0.169 (0.206)		-0.171 (0.206)	0.782** (0.385)	0.038 (0.246)	-0.254 (0.200)
Δ External debt (% GDP) _{<i>t-1</i>}						0.680*** (0.132)	
<i>Banking characteristics</i>							
Δ Total assets (% GDP)		0.352** (0.160)	0.162 (0.185)	0.338** (0.165)			0.335** (0.159)
NPLs _{<i>t-1</i>}					-0.494*** (0.146)		
Global factors							
Global funding conditions (Δ VIX)				-0.022 (0.033)	-0.068* (0.036)	-0.036 (0.036)	-0.024 (0.033)
US monetary policy rate _{<i>t-1</i>}							0.504*** (0.190)
Dummy 2007 crisis	1.395 (0.852)	1.044 (0.853)	1.028 (0.882)	1.160 (0.881)	-0.264 (1.199)	1.649* (0.902)	0.461 (0.895)
Underidentification ^(a)	0.000	0.002	0.003	0.002	0.000	0.000	0.001
Sargan ^(b)	0.108	0.181	0.104	0.183	0.533	0.447	0.265
Endogeneity ^(c)	0.016	0.040	0.021	0.039	0.016	0.030	0.029
Observations	612	562	641	562	334	427	562
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Panel data two-step efficient generalized method of moments (GMM) estimator. The dependent variable is the quarterly growth in the stock of international claims of BIS reporting banks vis-à-vis private NFS. Standard errors in parentheses. *, **, *** denotes significance at 10%, 5%, 1% level. External debt data missing for China and South Africa. NPLs data missing for China. All regressions include a constant and country dummies that are not reported.

(a) p-value corresponding to the Kleibergen-Paap (2006) rk LM statistic. A rejection of the null indicates that the matrix is full column rank, i.e., the model is identified.

(b) The joint null hypothesis is that the instruments are valid instruments and that the excluded instruments are correctly excluded from the estimated equation.

(c) We test the endogeneity of monetary policy rate, GDP growth rate and total assets (% of GDP). Under the null hypothesis, the specified endogenous regressors can actually be treated as exogenous.

