

## FIRMS' FINANCIAL SOUNDNESS AND ACCESS TO CAPITAL MARKETS

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## FIRMS' FINANCIAL SOUNDNESS AND ACCESS TO CAPITAL MARKETS

We investigate if firms' tapping international markets show more vulnerable balance-sheets than historical records. Building on descriptive evidence, and a non-parametric analysis, we conclude that firms' balance-sheets are not more overstretched. Firms' leverage is similar than in past. Although firms are less profitable, they have improved their liquidity profile, and show higher debt-service capacity. Though, firms' access to international capital markets is easier, since yields have compressed, and maturities lengthened. Overall, firms' ability to tap markets does not seem to derive from an improvement in their balance-sheets. Beyond this big picture, we identify tail risks. The volume issued by more overstretched firms has increased. There are also severe data gaps, and there is substantially less information for non-listed firms. To investigate these issues, we construct a novel data set containing information on bond issuances and firms' balance-sheets for the period 2000-2013.

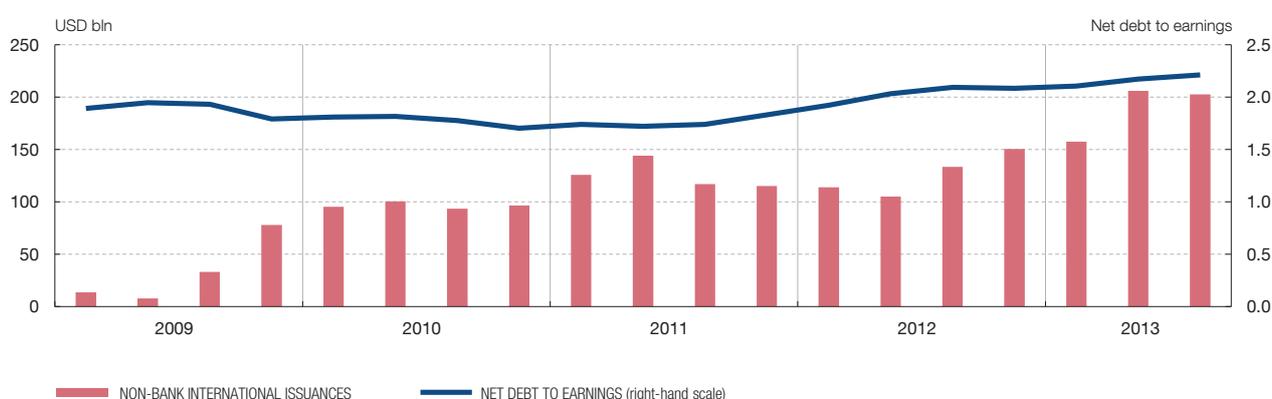
### 1 Introduction

The growth of market-based financing is probably the most defining feature of the post-crisis financial markets.<sup>1</sup> The easy access to capital markets by emerging economies' non-financial corporations is deemed particularly noticeable. However, there is considerable uncertainty about most of its features, including its actual size. Non-financial corporations' debt issuances at international capital markets, according to the BIS nationality measure, amounted for 100 US bn in 2013, well ahead, of the 31 US bn back in 2007. Since this criterion classifies deals according to the nationality of the parent company, it accounts for issuances when companies use non-financial subsidiaries incorporated overseas [McCauley *et al.* (2013), Turner (2014), or Shin (2013, 2014)]. However, non-financial firms' actual issuances could be somewhat higher, since they might use financial vehicles to tap international markets. The upper bound of their issuances is given by private non-banks' debt issuances, which hovered around 200 US bn in 2013, and could reach similar numbers 2014 – as shown in Chart 1 –.

<sup>1</sup> The process can reflect financial disintermediation, driven by global banks' deleveraging [BIS (2013), Serena Garralda (2014)], probably fostered by low returns in traditional assets and search for yield [Lo Luca *et al.* (2014)].

FINANCIAL DESINTERMEDIATION AND LEVERAGE (a)

CHART 1



SOURCES: Chui *et al.* (2014); and BIS Debt Securities by Nationality.

**a** Net debt to earnings is obtained from Chui *et al.* (2014). It is defined as net debt (total debt-cash) to earnings; simple average of seven emerging economies (obtained with firm-level data from S&P IQ). International debt issuances by nationality, of all emerging economies, sum of the last four quarters. Non-bank international issuances include issuances of non-financial corporations and other financial corporations. This is an upper bound of non-financial corporations issuances, as it takes into account issuances by financial vehicles incorporated overseas.

Large international debt issuances have been often a telltale sign of mounting balance-sheet risks. Unsurprisingly, the process has attracted considerable attention, not least since emerging economies' non-financial corporations' soundness is worsening in parallel. Chart 1 shows how net debt to earnings – a popular measure of debt-service capacity – has increased in a number of emerging economies. There are also signs of increasing leverage, exhaustion of debt-service capacity, and lacking room to withstand financial shocks [IMF (2014a, 2014c), Chui *et al.* (2014), CGFS-FSB-SCAV (2014)]. More specific, regional, analyses have identified similar patterns of rising corporate leverage and risks, in Asia and Latin America [IMF (2014B), IADB (2014)].

But, in spite of this seeming relation, no link between the build-up of firms' vulnerabilities and the broad-based access to international capital markets has been established. Firms' leverage can be fuelled by other factors. Local capital markets are experiencing also a strong development, and to some extent are attracting large inflows of foreign investors. Domestic credit remains a dominant source of financing, and credit has grown strongly [Morgan Stanley (2014)].

As a consequence, large international debt issuances are not necessarily a sign of lacking market discipline in international capital markets, or mounting risks in emerging markets' corporations. In fact, there is substantial uncertainty on the soundness of firms tapping international markets. Many questions remain open. Do large bond issuances reflect a relaxation in credit standards, so that even overstretched firms can tap markets? Or, on the contrary, does this trend reflect a genuine deepening in international capital markets, and only sound firms are able to issue corporate bonds?

Answering these questions is key. If firms able to tap international markets are not more vulnerable than in past, large international debt issuances are probably a sign of transition towards a more market-based corporate financing. The process can reflect a substitution of global banks by alternative, less traditional lenders, making instrumental the understanding of their investment strategies. The analysis of firms' balance-sheets turns crucial not only to determine whether market discipline has changed over time, but also to assess whether firms have become more susceptible to shocks.

In this paper, we aim to shed light on these issues, by investigating if firms' tapping international bond markets show more vulnerable balance sheets than historical records. To address these questions, we delve into a number of balance-sheet metrics, and also on bonds features. We focus on leverage, debt-service capacity, profitability, and liquidity, and also on maturities and yields. Building on descriptive evidence, and a non-parametric analysis, we find that firms tapping markets are not more leveraged than in past. They are, however, less profitable, they have improved their liquidity profile, and show higher debt-service capacity. Moreover, firms are able to tap international capital markets at better conditions, since yields have compressed, and maturities lengthened. Beyond this big picture, we identify tail risks. Measured in absolute terms, issuances by more overstretched firms have increased. There are also severe data gaps, since there is substantially less information for non-listed firms. According to most metrics, these firms are less sound. We identify as well pockets of vulnerability, since highly-leveraged firms are also those with less debt-service capacity and low profitability. For comparison purposes, we investigate also developments in local capital markets. Firms tapping local markets have better balance-sheets than in past. Their financial conditions have become similar to firms issuing bonds overseas.

By investigating these issues, our paper is making two contributions. First, we construct a novel database, which contains information on bond issuances and firms' balance-sheets. A key feature of our database is that, to gather non-financial corporations' bond issuances, we use the country and sector of the company in which ultimately the risk lies – this need not be the ultimate parent company –. This way we are able to track non-financial corporations' issuances also if they use financial affiliates incorporated overseas. A second attractive feature is that it comprises information on firm's balance sheet characteristics. The data covers the period 2000-2013, and the initial sample includes 13,199 bonds issued from 2,773 companies, and includes both domestic and international issuances. Second, we are contributing to the research investigating the risks stemming from disintermediation in international markets. Previous research had focused on bonds features, and the entry of new investors in emerging economies fixed-income markets. Existing evidence suggests that bond maturities are longer, which supports that firms have an easier access to capital markets [Shin (2014)]. Also, recent analyses have shown that US dollar bonds still overshadow issuances denominated in domestic currencies [Gruic and Wooldridge (2013)].<sup>2</sup> By delving into firms' soundness, we are shedding light on demand factors. Overall, we find that borrowers' fundamentals have not improved. The ability to tap markets, at long tenors and low prices, does not seem to derive from an improvement on firms' balance-sheets. Accordingly, it probably stems from global factors, such as very low interest rates in advanced economies and the larger presence of institutional investors (insurance companies and pension funds). Our results suggest that credit risk might remain subdued, but the lengthening of maturities can pose significant market risks. From the perspective of firms, their access to markets can be curtailed in case of changes in risk appetite, or a rise in long-term interest rates.

The rest of the paper is structured as follows. In section 2 we discuss the main features of our database, and how it compares with alternative sources of information. In section 3, we investigate the main features of firms' tapping international capital markets. We provide descriptive evidence, and a non-parametric analysis. In section 4, we compare the evolution with local capital markets. Finally, in section 6 we present the main conclusion.

## 2 Measuring bond issuances and firms' balance sheets. Data issues

To investigate firm's access to capital markets, it is instrumental to have joint information on non-financial corporations' bond issuances and their balance-sheet characteristics. We collect this information in two steps. Firstly, we obtain bond-level information on non-financial corporations' issuances in local and international markets. Secondly, for each company tapping capital markets, we get its balance-sheet information, if it is available. As we discuss below, the coverage is uneven and there are important data gaps. All in all, our initial sample includes 13,199 bonds issued by 2,773 firms of 36 emerging economies.<sup>3</sup>

### 2.1 MEASURING BOND ISSUANCES ON AN ULTIMATE RISK BASIS

Collecting information on non-financial corporations' bond issuances is challenging, in particular for international deals, and requires a number of methodological decisions. Most of the problems stem from the fact that firms can carry out operations which, in spite of having similar economic implications in terms of risk and liquidity, have very different structures. Firms can carry out deals using affiliates in different locations, which even have different sectors of activity. For instance, some large firms tap international markets through

<sup>2</sup> Although some emerging markets firms are tapping international markets in their domestic currency.

<sup>3</sup> Latin America includes Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and Venezuela; Emerging Europe includes Bulgaria, Belarus, Bosnia, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey, Ukraine; Africa & Middle East includes Egypt, Morocco, Nigeria, Saudi Arabia, South Africa, UAE. Asia includes India, Indonesia, Malaysia, Philippines, Thailand, South Korea.

affiliates (i.e. subsidiaries, or special investment vehicles) incorporated overseas. As stressed by Shin (2013) and Turner (2014), classifying these deals according to the direct issuer's nationality would be misleading, since they are issuing debt on behalf of their parent company. This problem is often overcome using the ultimate parent company nationality – the BIS nationality criterion –, which is becoming standard. A similar problem arises with the sector classification. If non-financial corporations use financial affiliates (for instance, a special investment vehicle) to issue bonds, classifying deals according to the affiliate's sector would underestimate non-financial bond issuances.

In short, using information on the direct issuer to identify these deals is troublesome – in particular, as previously said, for international issuances, since firms can use complex ways of carrying out deals –. Accordingly, our decision consists in identifying deals according to the country and sector of the company in which, at the end of the day, the risk lies. This need not lie in the ultimate parent company, as we discuss below. It can be considered as a measure on an “ultimate risk basis”. To identify these deals, we delve into the country of risk, which is identified by Bloomberg using four factors. Listed in order of importance, these factors are the management location; country of primary listing; country of revenue, and the reporting currency of the issuer.

Using this criterion, we obtain bond-level information for non-financial companies operating in Emerging Asia, Latin America, Emerging Europe, and Africa and Middle East. Table 1 provides some descriptive statistics: the number of bonds issued in the four geographic areas, the total volume issued, and the average size of the deal. We expect these numbers to be very close to the full universe of corporate bonds. Latin America and Asia are by far the regions where firms are more active in international markets, both in terms of firms and bonds. Local markets are of similar size, although there are more firms active – and bonds are, on average, smaller –<sup>4</sup>. The development of local markets is higher in Asia.

4 We show as well the number of firms which have tapped markets in the period under analysis. The number of bonds issued is, by construction, at least equal to the number of firms, since some companies have tapped markets in several years. If a company taps markets several times in a year, we group the issuances into a single deal. The size is the sum of the volumes issued that year, and for bond's features (maturity, rating, coupon), we keep the average of the deals.

BOND ISSUANCES. STYLIZED FACTS (a)

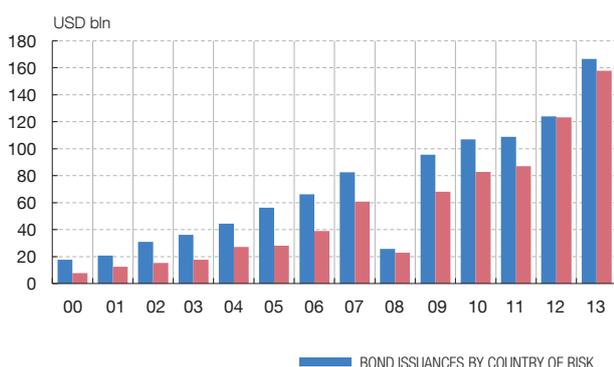
TABLE 1

	Bonds			Firms
	Number	Volume	Average deal	
<b>Bonds at international markets</b>				
Total	2,391	971,281	406	890
Latin America	1,037	518,104	500	301
Africa & Middle East	121	77,447	640	55
Emerging Europe	328	161,178	491	157
Asia	905	214,552	237	377
<b>Bonds at local markets</b>				
Total	10,808	1,259,770	117	1883
Latin America	1,559	265,518	170	551
Africa & Middle East	317	64,297	203	81
Emerging Europe	950	146,992	155	427
Asia	7,982	782,963	98	824

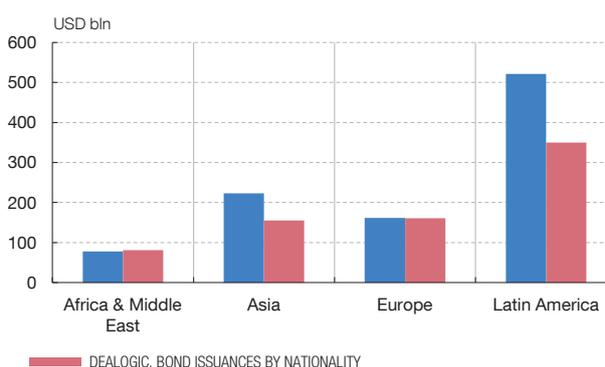
SOURCES: Bloomberg and own elaboration.

a Latin America includes Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and Venezuela; Emerging Europe includes Bulgaria, Belarus, Bosnia, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey, Ukraine; Africa & Middle East includes Egypt, Morocco, Nigeria, Saudi Arabia, South Africa, UAE. Asia includes India, Indonesia, Malaysia, Philippines, Thailand, South Korea.

2.1 AGGREGATE BY YEAR



2.1 AGGREGATE BY REGION



SOURCES: Bloomberg and Dealogic.

a The chart depicts Dealogic data (gross international bond issuances by nationality), and our data sample, gathered using Bloomberg. There are methodological differences between the series. Bloomberg data identifies the country and sector delving into the company which ultimately holds the risk.

EXAMPLES OF BONDS ISSUED BY FINANCIAL SPECIAL PURPOSE VEHICLES

TABLE 2

Company Name	Parent Company	Country of Incorporation	Country of Risk	CUSIP	Amount (USD bln)
Petrobras Global Finance BV	PETROBRAS - PETROLEO BRAS-PR	Netherlands	Brazil	71647NAF6	3.5
Lukoil International Finance BV	LUKOIL OAO	Netherlands	Russia	EJ6431419	1.5
Gazprom Neft OAO Via GPN Capital SA	GAZPROM NEFT OAO-CLS	Luxemburg	Russia	EJ9515473	1.5
Russian Railways via RZD Capital PLC	RUSSIAN RAILWAYS JSC	Ireland	Russia	EJ6158582	1.3
AngloGold Ashanti Holdings PLC	ANGLOGOLD ASHANTI LTD	Isle of Man	South Africa	03512TAD3	1.3
Metalloinvest Finance Ltd	METALLOINVEST HOLDING CO OAO	Ireland	Russia	EJ8456547	1.0
SABIC Capital II BV	SAUDI BASIC INDUSTRIES CORP	Netherland	Saudi Arabia	EJ8456547	1.0

SOURCE: Bloomberg.

Chart 2 depicts the historical evolution of bond issuances, for the period 2000-2013. Bond issuances, measured with our data, show an upward trend, consistently with other sources of information. The volume issued is higher than the volume issued obtained by Dealogic. This gap can stem from some methodological differences and coverage, which make them not entirely comparable.

For instance, the criterion we use to identify non-financial corporations issuances is fairly close to the nationality classification, but with two differences. On the one hand, if a parent company does not support or guarantee explicitly an affiliate, we classify the latter's issuances with its own country and sector. We aim to reflect that the ultimate risk is retained by this affiliate. On the other hand, the sectoral classification is always that of the company in which the risk ultimately lies. This way we track non-financial corporations' issuances also when they carry out deals using affiliated financial vehicles incorporated overseas. Table 2 shows some examples of these types of deals. Appendix 1 provides more information on data issues.

## 2.2 FIRMS' BALANCE SHEETS

The next step to assess the soundness of firms tapping capital markets is to gather their balance-sheets, and select a number of relevant indicators. Ideally, we would like to obtain full balance-sheet information for every company tapping capital markets. In practice, the coverage is uneven, and there are important data gaps, which we discuss below.

Concept	Variable	Observations	
		Firms	As % of amount issued
Leverage	Total assets to common equity (leverage)	1,001	73.33
Profitability	Return on Assets	868	65.82
Debt service capacity	Interest Coverage Ratio	1,010	74.68
Long-term prospects	CAPEX-capital expenditures	724	57.77
Solvency	Debt to EBITDA	1,037	77.80
Liquidity	Current ratio	1,052	77.32

SOURCES: Bloomberg and own elaboration.

a For firms tapping international capital markets. Issuances of the same firm in different years are counted as different observations.

To choose these metrics, we leverage on previous research, and follow recent analyses on firms' vulnerabilities [IMF (2014a, 2014b)]. We end up choosing six indicators to analyze different and specific features of firms' soundness: leverage, debt service capacity, solvency, liquidity, and current and prospective profitability. To assess leverage, we use total assets to common equity (for shortness, we refer to it as leverage). As a solvency measure, we include the debt to EBITDA. It assesses the size of debt relative to current earnings (its fluctuations often have to do with sharp changes in benefits, more than swings in debt). To assess the risks of short-term financial problems, we include the interest coverage ratio, which is a popular measure of the ability to service debt. It measures earnings relative interest payments. We use two measures of profitability. The return on assets (ROA) allows assessing current profitability. To grasp long-term prospects, we look at capital expenditures growth (CAPEX growth). Firms investing are expected to have brighter prospects. Finally, to gauge liquidity, we include the current ratio. It is defined as the ratio of liquid assets to short-term liabilities. It allows grasping if a firm can disinvest in order to pay its short-term obligations. Table 3 shows the metrics chosen, and the number of firms for which we have information.<sup>5</sup>

Our balance-sheet information is, at first glance, rather informative. The number of firms with information hovers around 700-1,000, depending on their indicator. The volume issued by these firms represents around 55%-80% of the total volume of bonds. However, the coverage is uneven. To this regard, a key dimension is a firm's market status. Unlike traditional data sources, our data set contains information on non-listed firms. However, the coverage is much better for listed than for non-listed firms. Appendix 1 discusses this issue, providing further information on our balance-sheet data, and how it compares with other data sources.

### 3 Firms' vulnerabilities and access to international capital markets

#### 3.1 FRAMEWORK FOR ANALYSIS

To investigate firms' access to international markets, we analyze their balance sheets, and the main features of their bonds issuances. Both are relevant to understand how market discipline and financing conditions have evolved over time. The four dimensions of the firm's financial health we look at are leverage, profitability, solvency and liquidity. To gauge bonds features, we look at coupon and maturity.

We proceed in four steps. Firstly, we provide some preliminary evidence. Second, we use a non-parametric analysis to investigate if distributions have shifted over time. Third, we

<sup>5</sup> As described in note 4, we are grouping all bond issuances within a year into a single deal. Hence, we have only one observation (balance-sheet information) for each year in which the firm taps markets (even if the firm carries out several issuances). We drop bonds with volumes lower than 30 US million to avoid a large bias towards small issuers. These bonds represent just 1.3% of total amount issued.

investigate tail risks, which we define as the volume issued by weak firms, according to the metrics analyzed (leverage, profitability, solvency, liquidity). Finally, we analyze jointly all variables, to fully grasp firms' financial conditions.

Overall, firms' balance-sheets are not significantly worse than pre-crisis levels, although they have changed. We find that firms are less profitable, they have a better liquidity profile, more ability to service debt, and similar leverage. At the same time bonds coupons have decreased and maturities have lengthened, improving corporate financing conditions. These findings may be in line with a change towards more market-based corporate financing, although it is not clear that this trend will continue after global interest rates return to normalized levels. Moreover, the sheer increase in total issuances implies that the volume issued by weak firms is on the rise.

### 3.2 DESCRIPTIVE ANALYSIS

In Chart 3 we show the historical evolution of a number descriptive statistics for each of the balance-sheet metrics under analysis. We include the median, and the interquartile range. All these statistics are computed on a yearly basis, for all firms issuing bonds overseas. Therefore, each graph shows how firms tapping international markets in a given year compare, in the dimension under analysis, with firms acceding markets in other periods of time. These statistics are robust to outliers, in particular in the latest years, when the number of firm is fairly large.

The evolution of leverage is shown in Chart 3.1. Leverage is defined as the ratio of total assets to common equity, so larger values indicate that the firm is relying more on debt (instead of raising common equity) to meet its financing needs. Highly leveraged firms may be more likely to suffer from financial stress under adverse scenarios (fall in profits, decreasing liquidity...) due to their larger debt servicing costs. Leverage has remained broadly constant over time, in spite of the large issuances of the last years. Indeed, during the last two years we observe a slight reduction.

We find, however, that firms tapping international markets are less profitable than before the global financial crisis. In Chart 3.2 we assess the profitability of firms tapping international markets by delving into the return on assets, or ROA. In the last years the ROA remains stable around 4%, at much lower levels than before the crisis.<sup>6</sup>

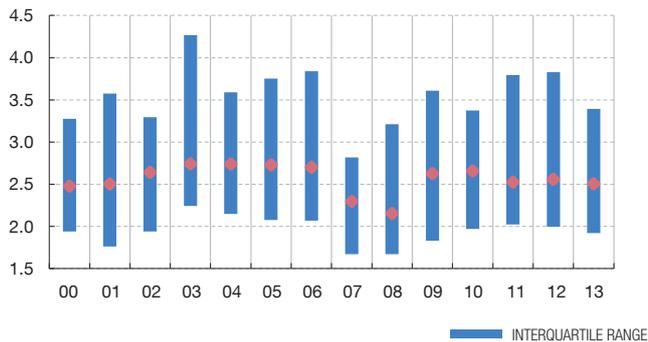
On the contrary, the solvency of firms issuing bonds overseas does not seem compromised. We gauge the solvency of firms, in Chart 3.3, using interest coverage ratio, or ICR. The ratio is defined as earnings before interest and taxes to total interest expenses. Abnormally low levels of ICR (below one) put firms under stress and compromise their future viability. The interest coverage ratio was lower in the immediate aftermath of the global financial crisis, driven by a contraction in profits, but has recovered since then. In 2013, it is similar to the pre-crisis levels.<sup>7</sup>

Finally, we find as well an improvement in liquidity. To study firms' liquidity we use the current ratio (current assets/current liabilities). Current assets are defined as all assets that are reasonably expected to be converted into cash within one year. Current liabilities are

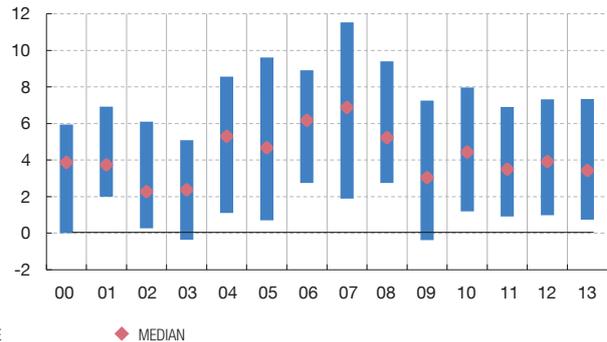
<sup>6</sup> The ROA is also related to economic growth. Since there has been a worldwide economic slowdown, it is not rare that firms issuing bonds in international markets show lower profitability. In other words, we are not looking at their relative profitability, compared with advanced economies firms.

<sup>7</sup> These results are robust when we use, as an alternative measure of financial solvency, the debt to earnings ratio. This measure shows how many years would take to repay current debt at the present level of EBITDA (earnings before interest, taxes, depreciation and amortization). This variable has shown a similar behaviour than the ICR over time, with a large deterioration after 2009 and some recovery during the last two years.

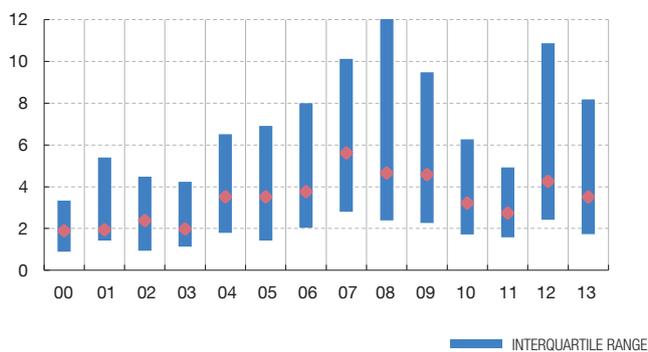
3.1 LEVERAGE



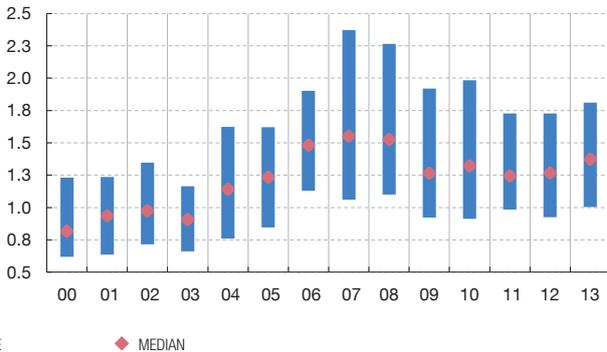
3.2 RETURN ON ASSETS (ROA)



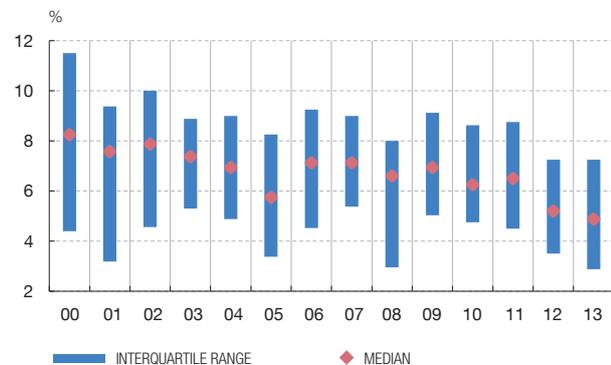
3.3 INTEREST COVERAGE RATIO (ICR)



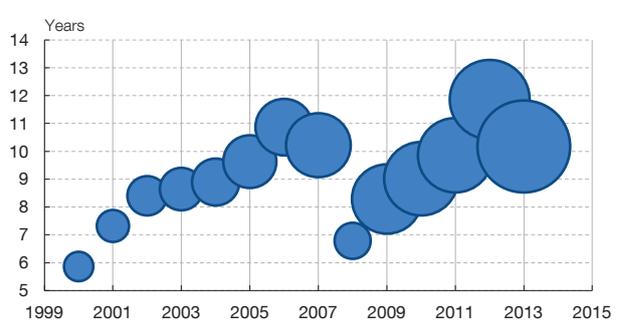
3.4 CURRENT RATIO



3.5 COUPON



3.6 MATURITY (WEIGHTED AVERAGE)



SOURCE: Bloomberg.

a Leverage is defined as total assets to common equity. Interest coverage rate is defined as EBITDA to total interest expenses. Current ratio is defined as current assets to current liabilities (assets that can be converted into cash and liabilities due within one year). Charts show interquartile range and median values for the different variables of interest. Chart 3.6 shows the weighted average of bond's maturity by amount issued. Bubble size represents volumes issued.

those liabilities due within one year. The main trend, depicted in Chart 3.4, is an overall increase in firms' liquidity in the last years, after the large contraction experienced during the global financial crisis. Liquidity has improved since 2009 and it is on the rise. This may be due, in part, to the longer maturities of corporate bonds issued during the last years.

Overall, balance-sheet metrics do not show a general deterioration with respect to the pre-crisis levels. However, access to markets is easier. A telltale indicator is the increase in volumes issued. But also maturities have lengthened and coupons have fallen, reducing roll-over risk and debt servicing costs. Chart 3.5 shows how the coupon has fallen over time, reaching in 2013 an all-time low. This in stark contrast with the evolution of spreads

### 3.3 NON-PARAMETRIC ANALYSIS

– a measure of risk appetite – which have increased compared to pre-crisis levels (see Appendix 1 for details).<sup>8</sup> Maturities have also increased. In Chart 3.6 we show the weighted-average maturity (since maturity is a very discrete measure, it is a better statistics than the median). Tenors have increased over time, consistently with previous research [Shin (2014)].

So far we have used the median and the interquartile range to characterize the balance-sheet indicators and bond's features. These statistics provide a partial picture of their main features, which are fully characterized by the density function. To better understand how firms' financial conditions have evolved over time and study the distribution of our selected variables, we perform a non-parametric analysis by carrying out a kernel density estimation.

The simplest and one of the oldest non-parametric estimators of the density function is the histogram. Although it is a useful tool, it has the drawbacks of being discontinuous and too "rough". In more general density estimates, intervals are allowed to overlap and a kernel density estimator assigns a weight to each observation (the function determining these weights is called kernel). Among various methods of density estimation the kernel estimator is better developed, both with respect to its numerical calculations and known analytical properties.

The kernel density estimator  $\hat{f}(x)$  can be written as:

$$\hat{f}(x) = \frac{1}{nh} \sum_{i=1}^n K\left(\frac{x_i - x}{h}\right) = \frac{1}{n} \sum_{i=1}^n w_i$$

Where  $K$  is the kernel function,  $h$  is the window width, and  $w_i$  is the weight function, which depends on the distance of  $x_i$  from  $x$  and the sample size through  $h$ . According to this definition the density function  $f$  will be estimated at a point  $x$  using the observations  $x_1, \dots, x_n$  from  $f$ . It is well known that the choice of kernel is a minor issue but the selection of the window width  $h$  is crucial. We use in our estimation the "optimal" width, the one that minimizes the mean integrated square error<sup>9</sup> (MISE)  $E \{ \int [\hat{f}(x) - f(x)]^2 dx \}$ .

We estimate density functions for the period before the financial crisis (2000-2007), after the crisis (2010-2013), and for the year 2013 alone.<sup>10</sup> Chart 4 depicts those estimated densities for the main variables of interest. Overall the results draw similar conclusions than those obtained from the descriptive statistics.

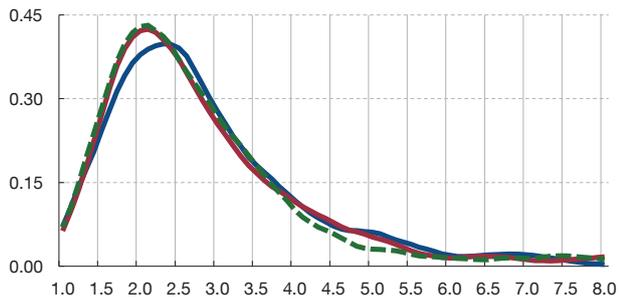
Leverage does not show relevant changes over time while the distribution of current ratio and interest-coverage ratio has improved with respect to pre-crisis levels. The ROA displays a clear worsening, with more weight assigned to lower values for the periods after the crisis. It does not seem to be an overall deterioration of the balance-sheet fundamentals compared to the conditions before the crisis, especially if we compare the distribution for year 2013.

<sup>8</sup> We compute the difference between coupons and Treasury rates for bonds denominated in dollars. Spreads show the lowest values over the period 2005-2007, experiencing an increase afterwards.

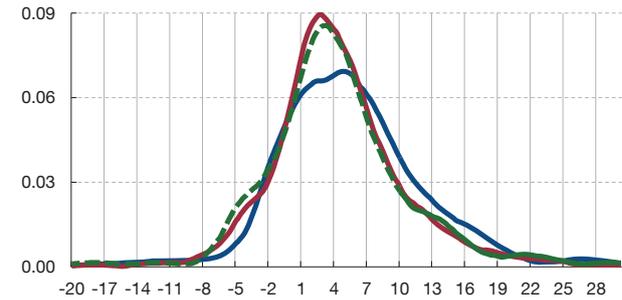
<sup>9</sup> For highly skewed densities this optimal width is usually too wide and oversmooths the density. We perform some robustness checks using other widths to deal with this problem, obtaining similar results. show the lowest values over the period 2005-2007, experiencing an increase afterwards.

<sup>10</sup> Macroeconomic developments (ie, global economic growth) may be important drivers of some variables evolution. To check this we compute the density functions using 2000-2005 as our base period (we remove years 2006 and 2007, of abnormally high global economic growth). Our results are qualitatively similar to the ones depicted from the density functions estimated over 2000-2007. The main difference comes from the density of ROA, which shows a similar shape over the periods 2000-2005 and 2013. To that extent, if we use 2000-2005 as our base period we do not observe a deterioration of ROA.

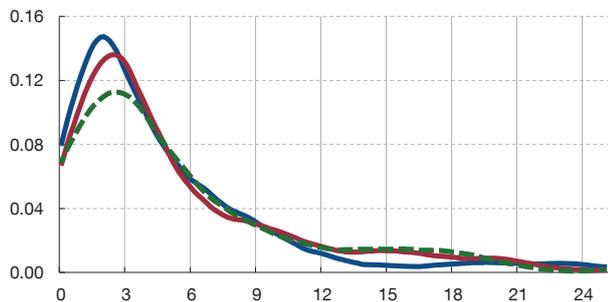
4.1 ESTIMATION FOR LEVERAGE



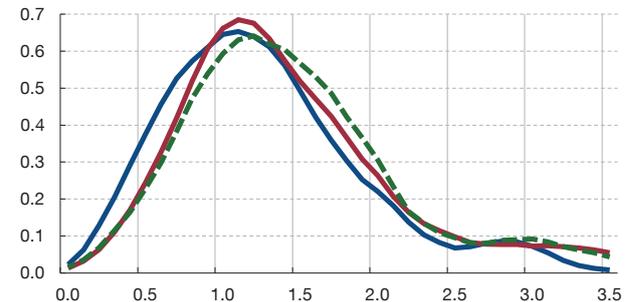
4.2 ESTIMATION FOR ROA



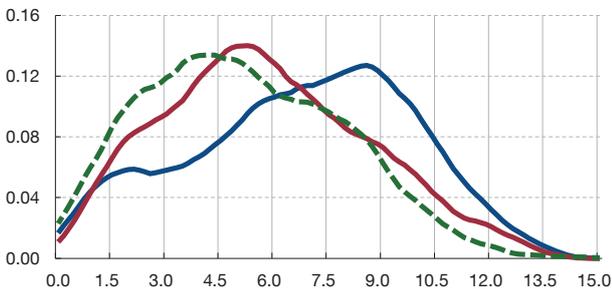
4.3 ESTIMATION FOR ICR



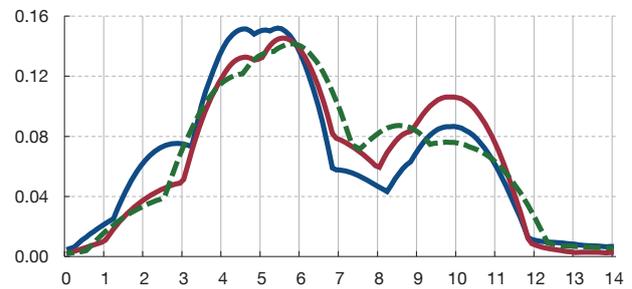
4.4 ESTIMATION FOR CURRENT RATIO



4.5 ESTIMATION FOR COUPON



4.6 ESTIMATION FOR MATURITY



— 2000-2007    — 2010-2013    - - - 2013

SOURCE: Own calculations.

a Charts show estimated kernel density functions for different periods. We use the "Epanechnikov" kernel function and the "optimal" window width (the one that minimizes the mean integrated square error). Robustness checks using different kernel functions and window widths show similar qualitative results. To control for the potential influence of outliers, we exclude observations in the 1% from upper and lower tails of the distribution.

With respect to bonds features, coupons and terms show the same patterns we have already documented. Kernel density estimations show more weight on lower coupons compared to pre-crisis levels. They also show more weight on longer maturities. This is in line with our previous results and supports the view of a change towards easier access to capital markets without an overall improvement of balance-sheet fundamentals.

3.4 TAIL RISKS

Tail risks can be defined as those stemming from the volume issued by overstretched firms. Weak firms are those which, in absolute terms, have worrisome balance-sheet metrics. The evidence shown so far suggests that tail risks could be on the rise. The sheer increase in debt issuances implies that, everything else equal, issuances by vulnerable firms could be

increasing in absolute terms. Moreover, tail risks fluctuate with the type of firms acceding international markets. Accordingly, a shift towards a riskier distribution – i.e., weaker firms acceding markets – is associated with more risks on the tails, and the non-parametric analysis has shown some shifts in the distributions, which are worrisome in terms of profitability (ROA).

To investigate tail risks, we identify weak firms defining, for each variable, three thresholds, which we choose following IMF (2014b). Firms are then classified in four buckets according to their balance-sheet soundness. As in our previous analyses, we look at leverage, ROA, interest coverage ratio, and the current ratio.

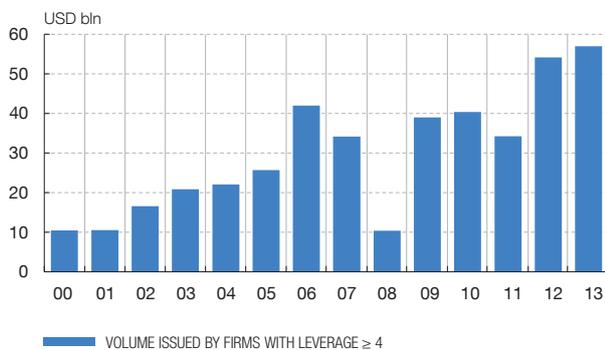
In Chart 5 we depict the volume of issuances by firms with high leverage, low profitability, low solvency, and low liquidity. It is apparent that tail risks – the volume issued by weak firms – are on the rise, although not at the same speed in all dimensions. The increase in issuances by low profitable firms, depicted in Chart 5.2, is particularly remarkable. Firms with negative profits have issued more than 30 US bn in 2013, a fourfold increase with respect to 2010. This reflects that low profitable firms are increasingly tapping international markets.

There is also a substantial increase in the volume issued by firms with low interest coverage ratio (Chart 5.3). Their issuances amounted for more than 10 US bn in every year after the crisis, in stark contrast with the pre-crisis period, when they were negligible. Chart 7.1

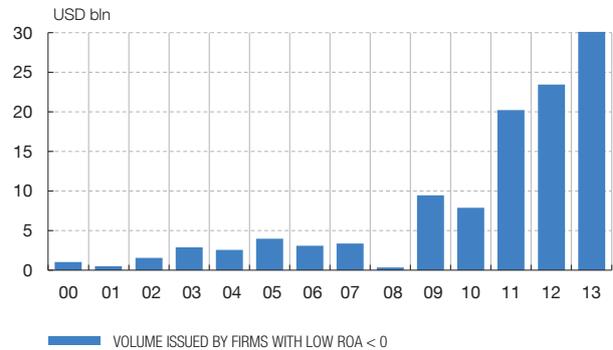
TAIL RISK, VOLUMES ISSUED BY WEAK FIRMS (a)

CHART 5

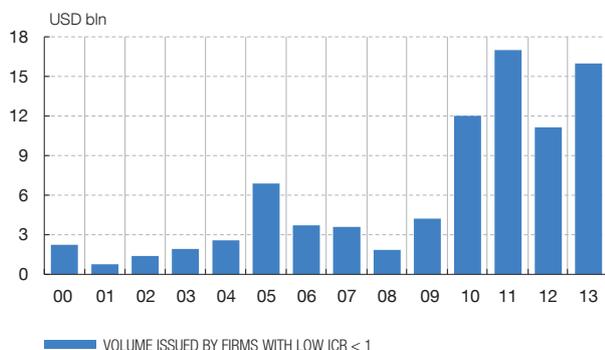
5.1 VOLUMES ISSUED BY HIGHLY LEVERAGED FIRMS



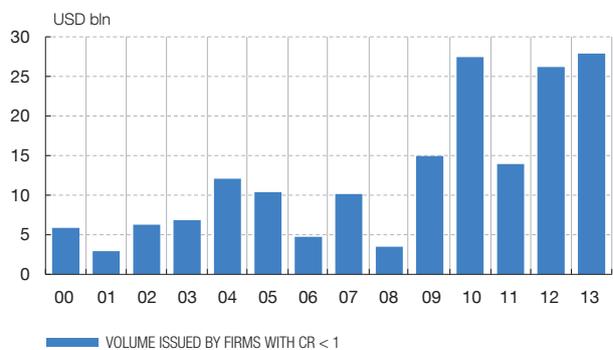
5.2 VOLUME ISSUED BY FIRMS WITH LOW ROA



5.3 VOLUME ISSUED BY FIRMS WITH LOW ICR



5.4 VOLUME ISSUED BY FIRMS WITH LOW CURRENT RATIO



SOURCE: Bloomberg.

a Charts show volumes of bonds issued in international markets by weak firms. Overall, amounts issued have increased over time.

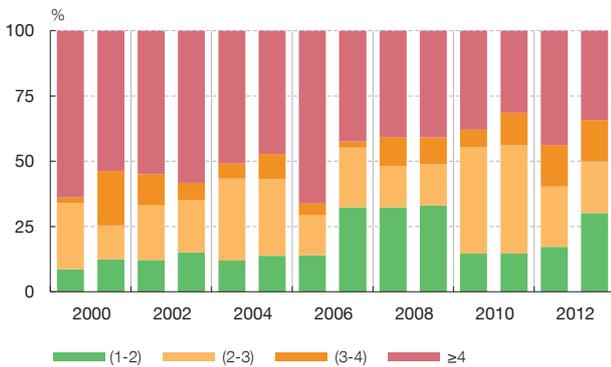
shows that highly leveraged firms (those with leverage over 4) have issued bonds amounting for 60 US bn in 2013. This number is very large in absolute terms, and it is three times higher than the pre-crisis numbers. Similarly, issuances by firms with low liquidity have increased in absolute size, and already amount for 30 US bn. Overall, issuances by firms which are weak, in absolute terms, have increased. This suggests that, beyond the average developments, some risks are building up in the tails.

To further investigate the build-up of tail risks, in Chart 6 we break down the volume issued by corporations, according to firms' level of soundness. Red bars represent the proportion of issuances which are due for weak firms, while green bars represent issuances of sound firms. It is apparent that the risks are building up more sharply in profitability. In 2013, issuances by firms with negative profits amounted for close to 20% of the total. In parallel, the volume issued by highly profitable firms has decreased, so that in 2013 it accounted for 30% of the total. This is by far the lowest proportion in our sample. The picture does not seem either bright enough for solvency – measured by the interest coverage ratio –. It is apparent in Chart 6.3 that issuances by firms with low ICR amounted for 10% of the total. Still, issuances by firms with high ICR (above 10) accounted for more than 50% of the volume issued in 2013. Although this is not a high number, compared with pre-crisis levels, it implies a correction with respect to 2011, when they were as low as 20% of the total.

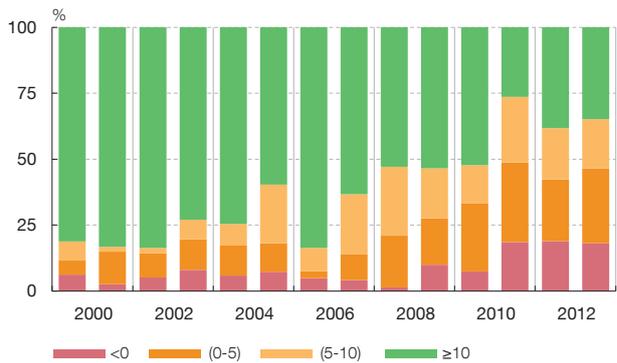
RISK ASSESSMENT. DISTRIBUTION OF ISSUANCES BY LEVELS OF BALANCE-SHEET VARIABLES (a)

CHART 6

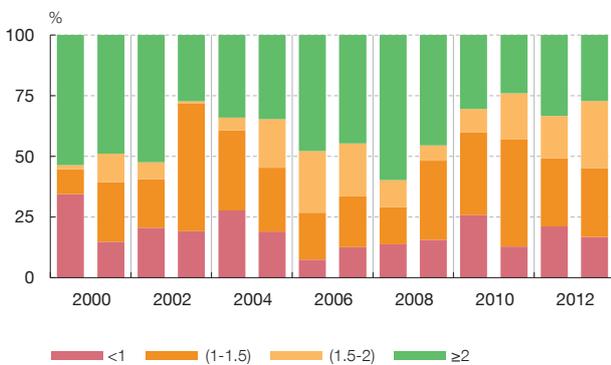
6.1 CORPORATE ISSUANCES BY FINANCIAL LEVERAGE



6.2 CORPORATE ISSUANCES BY ROA



6.3 CORPORATE ISSUANCES BY ICR



6.4 CORPORATE ISSUANCES BY CURRENT RATIO



SOURCE: Bloomberg.

a Charts show the distribution of total amount issued in international markets by the different levels of the issuers' balance-sheet variables. Red represents the proportion issued by weak firms; green represents issuances by sound firms. Orange and yellow represent issuances by weak-medium, and medium-sound firms. Buckets are defined following IMF (2014b). Leverage is defined as total assets to common equity. ROA is the return on assets. Interest coverage rate is defined as EBITDA to total interest expenses. Current ratio is defined as current assets to current liabilities (assets that can be converted into cash and liabilities due within one year).

In contrast, the proportion of debt issued by firms with high leverage or low liquidity has decreased over time. Issuances by firms with leverage over 4 – the threshold to classify high-leveraged firms – represent a decreasing proportion of the total. A similar mild assessment emerges when we analyze the distribution of the volume of issuances according to firms’ liquidity, in Chart 6.4. Issuances by highly liquid firms (green bars) have decreased, but in benefit of medium-to-high liquid firms (yellow bars). Both types of firms accounted for 55% of total issuances in 2013, a high number for historical standards.

3.5 HOW VULNERABLE ARE, OVERALL, FIRMS TAPPING INTERNATIONAL MARKETS?

Next we perform a joint assessment of firms’ vulnerabilities. In Chart 7.1 we display the values of all the balance-sheet metrics in 2013, after normalizing its values. This way we can compare them, at the same time, with the existing values in the period before the crisis (2000-2007). The closer are these values to the outer line, the better the current situation, compared to historical records.

The chart shows additional information though, as we add two more variables: debt to EBITDA and the ratio of capital expenditure to total assets. The debt to EBITDA, refers to the long-term solvency prospects of the firm, complementing somehow the interest coverage ratio, which refers more to the short-term (debt to EBITDA is also commonly used as an indicator of leverage). In addition, capital expenditure adds another perspective to firms’ profitability, being an indicator of expected future returns.

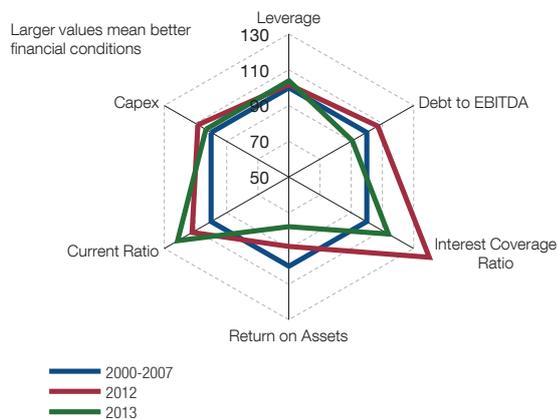
Overall we derive similar conclusions as those coming from the previous sections: we find similar levels of leverage, a fall in profitability and some improvement on the liquidity profile and solvency. Debt to EBITDA has not changed significantly compared to the pre-crisis period, experiencing some deterioration during 2013. CAPEX growth has improved slightly over time, mitigating to some extent the poor performance of the return on assets.

These findings reinforce that there is not an overall deterioration of balance-sheet soundness. However, previous analysis of tail risk displayed an increase in the volumes of corporate bonds issued by overstretched firms. Accordingly, in Chart 7.2 we conduct a

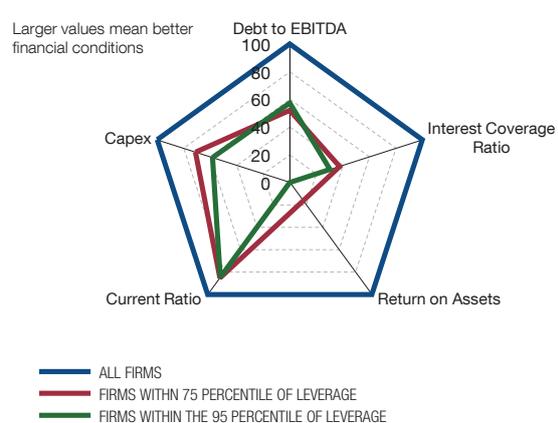
JOINT ANALYSIS OF FINANCIAL CONDITIONS (a)

CHART 7

7.1 FINANCIAL CONDITIONS RELATIVE TO PRECRISIS LEVELS (a)



7.2 FINANCIAL CONDITIONS OF HIGHLY LEVERAGED FIRMS (b)



SOURCE: Bloomberg.

- a Blue line represents standardized values (100) for the median of each variable over the period 2000-2007 (averages of the median across years). Overall, financial conditions have improved, with Debt to EBITDA and ROA showing the worst performance. Capex is defined as the ratio of capital expenditure to total assets.
- b Blue line represents standardized values (100) for the median of each variable in 2013. Red (green) line shows median values for each variable among those firms within the 75 (95) percentile of leverage. Values for ROA turn out to be negative within the 95 percentile of leverage and we have assigned a standardized value of zero.

similar analysis for firms with the largest levels of leverage in 2013. We analyze firms within the 75 (95)-percentile of leverage, corresponding to levels of leverage greater than 3.4 (10.1). The closer these values are to the outer line, the more similar highly-leveraged firms are to the full population of firms.

It is apparent the worsening of balance-sheet indicators among these firms, since these firms' balance-sheet metrics are far from the outer line. The evolution of the interest coverage ratio and return on assets are especially worrisome, not even reaching half of the level achieved by the total sample of firms. Moreover, the return on assets turns negative for those firms within the 95-percentile of leverage.

All in all, highly leveraged corporations seem to be hiding a "pocket of risk" which it is not apparent at the aggregate level. These firms are also in a weaker situation, in other dimensions. The tightening of financing conditions may put under pressure these highly leveraged firms, since debt service costs would increase. This may create feed-back loops resulting in further erosion of profits and more difficulties to pay interest expenses. Moreover, a contraction of risk appetite by international investors may result in re-financing problems for these firms. The next section further develops on other potential "pockets of risk".

#### 4 Data gaps and pockets of risk

Our general findings can mask pockets of risks, and data gaps can be particularly severe in some segments. Hence, in this section we study some groups of firms that deserve further attention: non-listed firms and new issuers. Moreover, we investigate developments in local markets. This is interesting for comparison purposes, since issuances in local markets have also increased rapidly in the last years.

##### 4.1 NON-LISTED COMPANIES

Non-listed firms account for a large proportion of international issuances.<sup>11</sup> These firms face fewer requirements to publicly release their balance-sheet information, being more difficult to assess their financial health. Given the large amount of issuances made by these firms, there is an important "data gap" on non-listed corporations, since standard sources of information fail to cover these firms. Our data set includes some information for non-listed companies, although it is far less comprehensive. This is apparent in Chart 8.1, which shows the balance-sheet data coverage and volumes of international issuances by market status.<sup>12</sup> For the period 2010-2013 there is, on average, balance-sheet information available for 69% for non-listed firms, in contrast with the coverage of 97 percent of the total volume issued by listed firms.

The data gap is severe, so we cannot provide conclusions on the financial conditions of non-listed firms. However, in Chart 8.2 we compare the balance-sheet indicators of listed and non-listed firms. The results have to be assessed with caution, but overall non-listed firms show weaker conditions in 2013, with the return on assets being half of that for listed corporations. The situation is even worse for highly leveraged non-listed firms, which show worrisome levels of profitability (negative ROA) and solvency. This suggests that vulnerabilities can be building up in non-listed firms.

##### 4.2 FIRST-TIME ISSUERS

We next analyze the balance-sheet soundness of those firms tapping international capital markets for the first time.<sup>13</sup> Lower creditworthiness of these firms could be a sign of a more

<sup>11</sup> During 2013 non-listed firms' issuances reached \$69.6 billion (42% of total issuances).

<sup>12</sup> Bloomberg only reports current market status such that the classification corresponds to 2014 independently of the issue date.

<sup>13</sup> We do not have issuance records before the year 2000 such that new issuers in a given years are those firms which had not issued bonds, at least, since the year 2000.

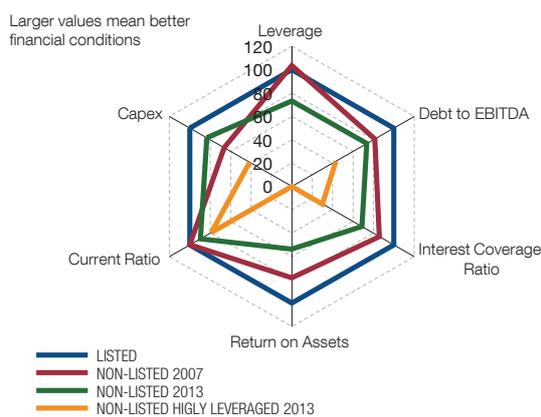
NON-LISTED FIRMS: COVERAGE AND FINANCIAL CONDITIONS

CHART 8

8.1 BALANCE-SHEET DATA COVERAGE BY MARKET STATUS (a)



8.2 RELATIVE FINANCIAL CONDITIONS OF NON-LISTED FIRMS (b)



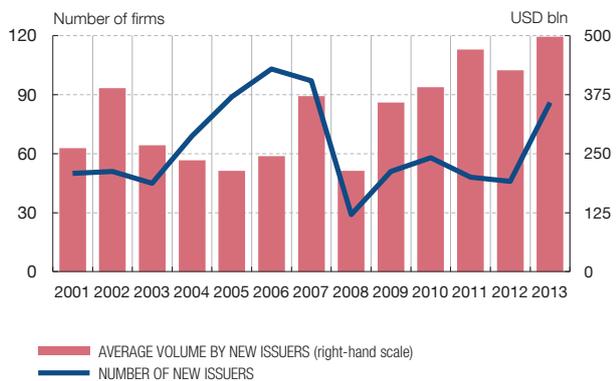
SOURCE: Bloomberg.

- a Market status in 2014.
- b Blue line represents standardized values (100) for the median of each variable for listed firms. Red (green) line shows values for each variable of non-listed firms, relative to the standardized values of listed firms in 2007 (2013). Orange line shows values for each variable for highly leverage non-listed firms, those within the 75 percentile of leverage. Non-listed firms show weaker financial conditions both in 2007 and 2013, and those highly leveraged present even weaker financial soundness. Values for ROA turn out to be negative within the 75 percentile of leverage and we have assigned a standardized value of zero.

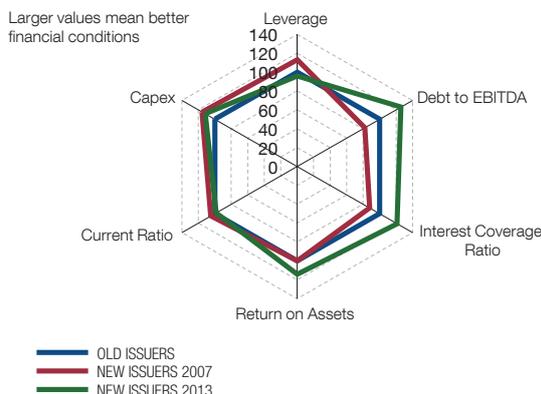
NEW ISSUERS: COVERAGE AND FINANCIAL CONDITIONS

CHART 9

9.1 NEW ISSUERS OF INTERNATIONAL BONDS (a)



9.2 RELATIVE FINANCIAL CONDITIONS OF NEW ISSUERS (b)



SOURCE: Bloomberg.

- a New issuers within our sample (2000-2013). Red bars show the average amount issued every year (total amount issued by new issuers/number of new issuers).
- b Blue line represents standardized values (100) for the median of each variable for firms that have previously issued international bonds. Red (green) line shows values for new issuers of international bonds relative to the standardized values for old issuers in 2007 (2013). New issuers show similar financial conditions than old issuers, especially in 2013, displaying even better levels of ICR, ROA and debt to EBITDA.

relaxed market discipline and the presence of another potential “pocket of risk”. The number of firms issuing bonds for the first time experienced a large fall in 2008, and it has recovered during 2013 (see Chart 9.1).

At the same time, average volumes issued by firms have increased since 2008, reaching a record high in 2013. Chart 9.2 shows that new issuers have similar financial conditions as those firms previously tapping international capital markets, displaying even better levels of debt to EBITDA, interest coverage ratio and ROA in 2013. As new issuers are at least as sound as previous issuers, it seems that investors are being able to keep credit standards

at the same level to those firms with previous reputation as issuers in international capital markets. Moreover, as we find that new issuers have slightly better financial conditions, it may be the case that these firms need to have sounder balance-sheets in order to access capital markets.

#### 4.3 LOCAL MARKETS

Domestic capital markets have also experienced a strong development during the last decade. Volumes issued have grown steadily over time, without suffering the large contraction documented on international issuances during 2008 (see Chart 10.1). Besides, total amounts issued have surpassed those in international markets every year.

These developments are mainly due to the deepening of Asian markets,<sup>14</sup> although the other regions have also followed similar trends. Balance-sheet data coverage is uneven as there is less information for firms tapping local markets, mainly due to the larger proportion of non-listed firms.

Chart 10.2 shows balance-sheet information on domestic issuers relative to that of international issuers. We find similar financial conditions between both groups of firms during 2013, although domestic issuers show weaker current ratios and lower levels of capital expenditure. On the other hand, figures in 2007 reveal that financial conditions were much weaker for domestic firms at that time. Interestingly, levels of leverage have barely changed. Finally, we also assess the financial soundness of more leveraged firms and non-listed firms. As we previously found with international issuers, non-listed and more leveraged corporations show weaker financial conditions, resulting in a similar “pocket of risk” that the one documented on firms tapping international capital markets.

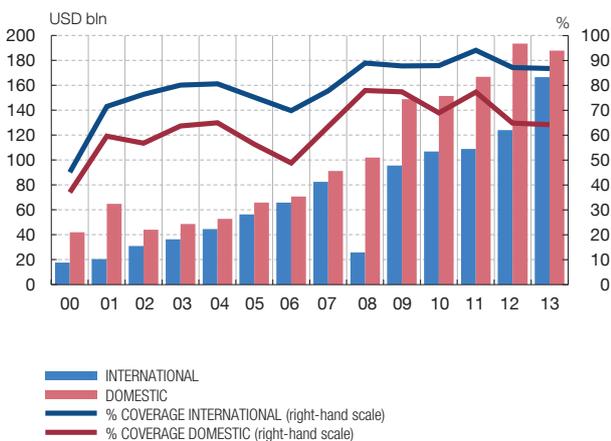
Summarizing, credit risk do not seem to be much larger for domestic issuers, and local capital markets have been a more reliable source of funding during the height of the

14 Asian capital markets accounted for 50% of total volume issued in domestic markets during 2013.

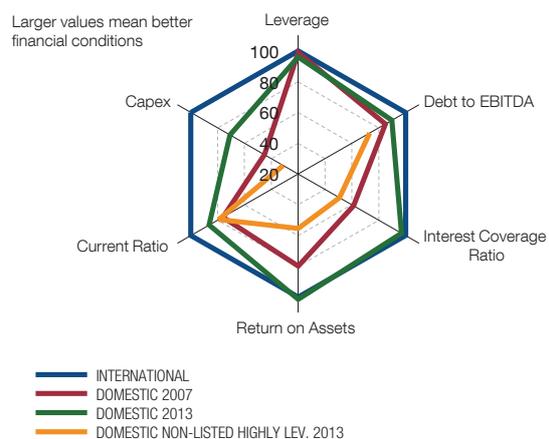
### DOMESTIC ISSUERS: COVERAGE AND FINANCIAL CONDITIONS

CHART 10

10.1 BALANCE-SHEET DATA COVERAGE OF DOMESTIC ISSUERS (a)



10.2 RELATIVE FINANCIAL CONDITIONS OF DOMESTIC ISSUERS (b)



SOURCE: Bloomberg.

- a Market status in 2014.
- b Blue line represents standardized values (100) for the median of each variable for international issuers. Red (green) line shows values for each variable for firms issuing bonds only in domestic markets relative to the standardized values of firms tapping international capital markets in 2007 (2013). Orange line shows values for each variable for highly leveraged (those in the 75 percentile of leverage) non-listed firms issuing bonds only in domestic markets. Domestic issuers seem to have weaker financial conditions, especially those highly leveraged and non-listed.

financial crisis. On the other hand, financing conditions are tougher, with domestic issuers paying larger coupons and facing shorter maturities.

## 5 Conclusions

In this paper we investigate if firms' tapping international markets show more vulnerable balance sheets than historical records, using a novel data set constructed with Bloomberg, which contains information on bond issuances and firms' balance-sheets for the period 2000-2013.

We document a large increase in bond issuances, as it is observed in research using other data sets. Our analyses suggest that, in spite of these large issuances, firms' tapping markets are not weaker than in past. Though, their access to international capital markets is easier, since yields have compressed, and maturities lengthened. We identify as well a build-up of tail risks, since the volume issued by more overstretched firms has increased. There are also severe data gaps, particularly among non-listed companies.

These findings raise several unknowns, which are key to assess risks for financial stability. A major issue is the possible existence of cross-country or regional heterogeneity. Identifying sectoral patterns is also relevant, since access to corporate capital markets is deemed to carry more risks for firms of the non-tradable sector. Overall, our general findings can mask pockets of risks, and data gaps can be particularly severe in some segments.

Our paper also poses questions on the drivers and risks of the process. Our results imply that the development of international capital markets does not seem to derive from an improvement on firms' balance-sheets. Accordingly, global factors probably have a relevant role. The lengthening of maturities suggests that institutional investors, with longer-term investment strategies, can be entering the market. Though, this requires to be investigated. As for the risks, our findings suggest that investors are not acquiring more credit risk, but they are becoming exposed to significant market risk. Large issuances coincide with longer tenors, implying longer durations of their fixed-income portfolios. Additionally, investors face a period of abnormal low market liquidity in emerging markets fixed-income. Finally, it turns crucial to investigate if the distinction between local and international markets is becoming blurred, in the current context of ample liquidity. We provide preliminary results suggesting that firms' tapping in local and international markets have more similar balance-sheets than in past. The issue requires, however, a more in-depth analysis.

From the perspective of borrowers, it is also crucial to identify how investor's appetite towards emerging markets could be affected by increases in interest rates in developed markets, or volatility, since balance-sheet characteristics do not seem to be driving the rise in corporate issuances, or justify the improvement in bonds features. If global investors decrease their portfolio share on emerging markets, firms may find difficult to obtain financing at current conditions.

## REFERENCES

- BIS (2013). "Low rates spur credit markets as banks lose ground", in *BIS Quarterly Review*, December.
- CGFS-FSB-SCAV (2014). *Joint CGFS-FSB-SCAV workshop on risks from currency mismatches and leverage on corporate balance sheets*.
- CHUI, M., I. FENDER, and V. SUSKHO (2014). "Risk related to EME corporate balance sheets: the role of leverage and currency mismatch", *BIS Quarterly Review*, September.
- DEUTSCHE BANK (2014). *Tight bank lending, lush bond market. New trends in European corporate debt issuance*, Current Issues, Global financial markets, Deutsche Bank Research.
- GRUIC, B., and P. WOOLDRIDGE (2013). "Who is issuing international bonds denominated in emerging market currencies?", Box 2, *BIS Quarterly Review*, December.

- IADB (2014). "Global recovery and monetary policy normalization. Escaping a chronicle foretold?", *2014 Latin America and Caribbean Macroeconomic Report*.
- IMF (2014a). *Global Financial Stability Report—Moving from Liquidity to Growth-Driven Market*, April.
- (2014b). *Regional Economic Outlook: Asia and Pacific. Sustaining the Momentum: Vigilance and Reforms*, April.
- (2014c). *Global Financial Stability Report—Risk Taking, Liquidity, and Shadow Banking: Curbing Excess While Promoting Growth*, April.
- LAROSIÈRE, J. (2013). "A world of warning: banking regulation is about to create pro-cyclical damage", European Savings Banks Conference.
- LO LUCA, M., G. NICOLETTI, and A. VIDAL MARTÍNEZ (2014). *Global bond corporate issuance: What role for US quantitative easing?*, ECB Working Paper No. 1 1649, March.
- MCCAULEY, R., C. UPPER, and A. VILLAR (2013). "Emerging market debt securities issuance in offshore centres", Box 2, *BIS Quarterly Review*, September.
- MORGAN STANLEY (2014). "EM Profile. EM Corporates. Rising Leverage, Rising Risk", Morgan Stanley Research.
- PAGAN, A., and A. ULLAH (1999). *Non-parametric econometrics*, Cambridge University Press.
- SERENA GARRALDA, J. M. (2014). "Financial disintermediation in international markets and global banks funding models", *Estabilidad Financiera*, 26, Banco de España.
- SHIN, H. (2013). "The Second Phase of Global Liquidity and its Impact on Emerging Economies", Keynote address at the Federal Reserve Bank of San Francisco Asia Economic Policy Conference.
- (2014). "The changing face of financial intermediation", *Lecture at the BIS 84<sup>th</sup> Annual General Meeting*.
- TURNER, P. (2014). *The global long-term interest rate, financial risks and policy choices in EMEs*, BIS Working Paper No. 441.

## Appendix 1: Data Issues

### Classifying bond issuances

In order to collect non-financial corporations' bond issuances, it is important to choose a sound criterion to identify the sector and country of the issuer. This is required to separate non-financial corporations' deals from those carried out by financial corporations. It is important also to account for all emerging corporations' issuances, even if they use affiliates incorporated overseas.

In this paper, we have identified their deals according to the country and sector of the company in which, at the end of the day, the risk lies. This need not lie in the ultimate parent company, and it can be considered as a measure on an "ultimate risk basis". To identify such way the deals, we have used the country of risk, identified by Bloomberg using

BALANCE-SHEET SOUNDNESS. METRICS (a)

TABLE A.1

Operation	Headquarters of the Company X [non-financial corporation]	Affiliate		Classification		
		Location	Status	Company ultimately holding the risk	Country of risk	Sector
1	Country A	—	—	Company X	A	NFC
2	Country A	Country B	Financial vehicle	Company X	A	NFC
3	Country A	Country B	Unlisted	Company X	A	NFC
4	Country A	Country B	Listed and explicit support/ guarantee from the parent	Company X	A	NFC
5	Country A	Country B	Listed company (independent from its parent)	Affiliate in country B	B	Sector of the affiliate

SOURCE: Own elaboration.

- a Operations 1 to 4 differ in its structure. The direct issuer can be the company X, as in (1), or an affiliate, as in 2-4; this affiliate can be either a financial vehicle (2), an unlisted affiliate (3), or a listed affiliate with explicit support from its parent (4). Operations 1 to 4 have in common that the ultimate risk lies in the company X. This is why our criterion classifies them equally. We consider them fundamentally different from operation 5, in which the affiliate is a listed company, with no support from its parent, which retains the risk. Therefore, our criterion classifies this deal differently, using the affiliate information.

four factors. Listed in order of importance, these factors are the management location; country of primary listing; country of revenue, and the reporting currency of the issuer.

To show how our criterion works, we present in table A.1 four operations (1 to 4) which, in spite of being structured in four different ways, have the same economic implications (in terms of risk and liquidity) for the non-financial corporation (i.e., “company X”). In the first way of structuring the operation, the company X issues directly the bond from the country in which the parent company headquartered. Alternatively, it can tap markets using a non-resident financial vehicle (2), an unlisted affiliate (3), or a listed affiliate which has explicit support/guarantee from its parent (4). Our decision is to classify them all using the country of incorporation and sector of the “company X”, since ultimately it is where the risk and liquidity lie. This criterion is, therefore, robust to different ways of structuring operations. Table 1 shows as well an operation carried out by an affiliate which is a listed company, with no explicit support (5). Our criterion assumes it is a different operation, since the risk remains outside the company X. Henceforth, the deal is classified according to the affiliate’s nationality and sector. This is an example of an operation in which the parent company does not hold ultimately the risk.

### Balance-sheet coverage

Chart A.1 shows the volume issued by listed and non-listed firms at international and local markets. It is apparent that non-listed firms account for a significant fraction of bond issuances, in particular at local markets. The coverage for listed companies is extremely high. It amounts for the 100% in the case of international issuances, and it is fairly close in local issuances. Information is much scarcer for non-listed companies. In the case of local markets, our balance-sheet information identifies less than 30% of the total volume issued. Moreover, the coverage has decreased in spite of the large growth in this type of issuances. Since Bloomberg provides only current information on market status, we have classified firms as listed if they are currently actively traded in an exchange and non-listed if they are not (non-listed firms include those acquired, delisted, private, unlisted, etc.).

FIRMS’ BOND ISSUANCES. BY MARKET OF ISSUANCE AND MARKET STATUS

CHART A.1

A.1.A VOLUME ISSUED. BY MARKET STATUS (a)



A.1.B BALANCE-SHEET COVERAGE (% OF TOTAL VOLUME) (b)



SOURCES: Bloomberg and own elaboration.

a Market status in 2014.

b Balance-sheet coverage of our database. The coverage is measured relative to the total volume issued. It is apparent how information is more scarce for non-listed companies. Data gaps are particularly severe for their issuances at local markets.

## Other sources for balance-sheet analyses

Our information has strong similarities with some traditional data sources for the analysis of non-financial corporations' balance-sheets, such Thomson Reuters WorldScope and S&P Capital IQ's Compustat Global. These databases cover between 90%-95% of global market capitalization and they also provide historical data on inactive publicly held companies (those which have merged, liquidated or become privately held). They have been used in a number of recent studies on firms' soundness [for instance, IMF (2014a, 2014b, 2014c), Morgan Stanley (2014)].

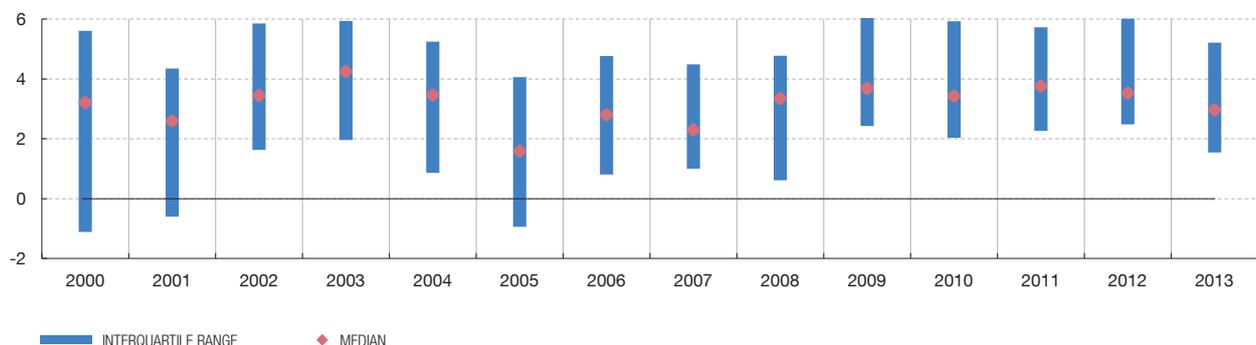
However, they are not suited to delve into global investors' discipline. They include firms acceding capital markets in a given year, with those which have not been active, or get funding from other lenders. Moreover, they focus on listed companies, offering almost no information on unlisted firms. This is an important caveat as the majority of non-listed firms do not report financial information, being difficult to assess their financial soundness. Unlike these traditional data sources, our balance-sheet information includes some non-listed firms, filling a data gap on previous studies. Although, Bloomberg does not report either balance-sheet information for all these companies, it provides partial information, which allows depicting a partial picture of non-listed firms' financial vulnerabilities.

## Bond spreads on international issuances

Chart A.2 shows the historical evolution of the spreads of corporate bond issuances in the primary market. Spreads reached their lowest levels during the period 2005-2007, signaling a possible undervaluation of risk by international investors over those years. This is in contrast with yields, which reached their all-time low in 2013. We interpret that the steady fall on coupons over the last years it is not related to lower credit risk but to global factors (low interest rates on advanced economies). As for credit risk, measured as the bond spread, it remains at similar levels than the average over the years before the financial crisis (2000-2007). This is consistent with a non overall deterioration of issuers' financial conditions, something we have found analyzing the balance sheet variables.

BOND SPREAD FOR INTERNATIONAL ISSUANCES DENOMINATED IN USD (a)

CHART A.2



SOURCES: Bloomberg and own elaboration.

a Spread is the difference between the bonds' coupon and treasury rates. Amount issued by international bonds denominated in USD represents 81% of total issuances.