INTERNATIONAL MONETARY FUND

Research Department

Debt Maturity and the Use of Short-term Debt

Evidence from Sovereigns and Firms

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No. 19/03

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Representing the African, European, and Research Departments and the Institute for Capacity Development

INTERNATIONAL MONETARY FUND

Cataloging-in-Publication Data

IMF Library

Names: Chen, Sophia, 1980-, author. | Ganum, Paola, author. | Liu, Lucy Qian, author. | Martinez, Leonardo (Economist), author. | Martinez Peria, Maria Soledad, author. | International Monetary Fund, publisher.
Title: Debt maturity and the use of short-term debt : evidence from sovereigns and firms / Sophia Chen, Paola Ganum, Lucy Liu, Leonardo Martinez and Soledad Martinez Peria.
Description: [Washington, DC] : International Monetary Fund, 2018. | December 2018. | Includes bibliographical references.
Identifiers: ISBN 9781484380536 (paper)
Subjects: LCSH: Debts, Public. | Corporate debt. | Debt management.
Classification: LCC HJ8015.C44 2018

Publication orders may be placed online, by fax, or through the mail:
International Monetary Fund, Publication Services
P.O. Box 92780, Washington, DC 20090, U.S.A.
Tel. (202) 623-7430 Fax: (202) 623-7201
E-mail: publications@imf.org
www.imfbookstore.org
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Acknowledgments

Excellent research assistance was provided by Jae Chung, Do Lee, and especially Huy Nguyen. We thank Maurice Obstfeld for his guidance and helpful suggestions. We also received excellent comments from Tamon Asomuna, Deniz Igan, Yen Mooi, and Aleksandra Zdzienicka. We are grateful to Anastasia Guscina for providing data on short-term sovereign domestic debt from an updated version of the database presented in Jeanne and Guscina (2006) and to Marialuz Morenia Badia for sharing data from the Global Debt Database described in Mbaye, Moreno Badia, and Chae (2018).

Executive Summary

The maturity structure of debt can have financial and real consequences. Short-term debt—typically defined as that maturing within a year—exposes borrowers to rollover risk (where the terms of financing are renegotiated to the detriment of the borrower) and is associated with financial crises. Moreover, debt maturity can impact a firm's ability to undertake long-term productive investments and, as a result, affect economic activity.

The aim of this paper is to examine the evolution and determinants of debt maturity and to characterize differences across countries. We investigate differences in debt maturity between advanced economies (AEs) and emerging markets and developing economies (EMDEs), and we analyze the behavior of debt maturity during crises and normal times. To study debt maturity, we assemble different data sets, including aggregate data on short-term external and international debt outstanding, sovereign and corporate bond issuance data, syndicated loan deal data, and corporate balance sheet information on leverage and short-term debt. In terms of the determinants of debt maturity, we examine the role of country-level and global factors and, in the case of corporate maturity, the impact of corporate characteristics.

The data on debt maturity show no consistent differences across income groups, but some differences exist depending on the instruments or market segments considered:

- The median maturity of government bond issuances is similar across EMDEs and AEs, but the median share of short-term debt issued in local markets is higher for the latter group of countries.

- The median maturity of corporate debt issuances is lower in EMDEs, but EMDEs can obtain longer maturities by issuing foreign currency debt in international markets.
- Even though the share of short-term to total syndicated loans is slightly higher among EMDEs than AEs, the average weighted maturity of syndicated loans is higher too. This is explained by the higher share of syndicated loans used by EMDEs for long-term project finance.
- Corporate balance sheet data, including firms of all sizes and not only those that are able to issue bonds or borrow in syndicated markets, show that the use of short-term debt is more prevalent among EMDEs.

Debt maturity drops during crises. This holds for both AEs and EMDEs, in the aggregate data and when focusing on government or corporate debt, regardless of the type of instrument examined.

Recently, debt issuance has grown significantly, and maturity has lengthened. But for EMDEs this has come at the cost of higher exposure to exchange rate changes, since most of the longer maturity issuances have been denominated in foreign currency.

Corporate characteristics are the most important determinants of corporate debt maturity. Corporate profitability and access to collateral are positively associated with debt maturity. Moreover, most of the variance of debt maturity is explained by corporate characteristics.

Country characteristics influence the maturity of sovereign debt issuances but do so differently across income groups and have limited impact on corporate issuances. Negative domestic shocks and weaker balance sheets are more strongly negatively associated with shorter sovereign debt maturity in the case of EMDEs relative to advanced economies. Property rights have a positive impact on corporate debt maturity, but other country-level factors are less consistently associated with corporate debt maturity.

Global factors influence debt maturities, but to a smaller degree than other variables. Sovereign and corporate debt maturity tend to lengthen as global risk aversion, or the term spread, drops. Yet global factors account for a relatively small percentage of the variance of debt maturity.

The findings from this paper lead to the following conclusions:

- Building adequate buffers (for example, liquid assets) during good times might allow firms and sovereigns to be less exposed to the decline in maturity that happens during crises.

- Improving their risk profile is especially important for EMDE sovereigns, since they are generally more affected by negative domestic shocks or a worsening in their balance sheet.
- Because the recent lengthening in corporate bond maturity has gone hand-in-hand with an increase in foreign currency debt, authorities should monitor and potentially curb foreign exchange exposures via targeted macro- and micro-prudential policies.
- The institutional environment matters for debt maturity. Governments seeking to borrow over the long term should implement policies that protect property rights, since an improvement in property rights is associated with an extension of debt maturity.
- Because firms' and sovereigns' debt maturities are sensitive to global factors, policymakers should prepare for a potential near-term decline in debt maturity as monetary conditions normalize and perhaps risk aversion increases.
- Significant data gaps should be addressed to allow policymakers to do a better job at monitoring developments in debt maturity. Financial accounts/flow of funds data, commonly available for some AEs, should be routinely collected across countries. Going more granular, collecting data on nonsyndicated bank lending, bank balance sheet data with a maturity breakdown, and data on household debt maturity would offer a more complete picture of the use and provision of short-term debt in an economy.

CHAPTER

1 Introduction

Decades of financial crises and, more recently, the global financial crisis (GFC) of 2007–09 have highlighted the dangers of high and fast-growing leverage among firms, households, and sovereigns. An extensive literature documents the increase in leverage across the economy in the years preceding the recent crisis (for example, Feldkircher 2014; Geanakoplos 2010; Lane and Milesi-Ferretti 2010; Kalemli-Ozcan, Sorensen, and Yesiltas 2012). More generally, empirical studies focusing on balance-sheet measures of leverage or credit growth show that rapid increases in credit outstanding frequently precede economic downturns and crises (Dell'Ariccia et al. 2012; Gourinchas and Obstfeld 2012; Jordá, Schularick, and Taylor 2013; Mendoza and Terrones 2008; Mian, Sufi, and Verner 2015; Reinhart and Rogoff 2008; Schularick and Taylor 2012).[1]

Recently, concerns have resurfaced about rising levels of public and private debt across economies. Among sovereigns, debt ratios have increased across the board. The average debt-to-GDP ratio for EMDEs rose from 36 percent in 2008 to 46 percent in 2016. During the same period, the average sovereign-debt-to-GDP ratio among AEs increased from 61 to 89 percent. As far as private debt is concerned, the main worry has been the rising indebtedness in EMDEs, driven by firms, where the average private-debt-to-GDP ratio rose from close to 64 percent during the GFC to 115 percent by 2016.[2] In particular, a significant rise in foreign currency debt has increased corporate vulnerability by exposing firms to sudden stops in external financing and currency depreciations (Acharya et al. 2015; IMF 2015; McCauley,

[1]Theory also shows that procyclical leverage is an important amplification mechanism in propagating financial shocks to the real economy (Bernanke and Gertler 1995; Brunnermeier and Sannikov 2014; Kiyotaki and Moore 1997).

[2]Public and private debt figures are weighted averages by each country's share of GDP. The underlying data come from the Global Debt Database presented in Mbaye, Moreno Badia, and Chae (2018).

McGuire, and Sushko 2015; Shin 2013; Sobrun and Turner 2015; *The Economist* 2015, 2016).

Less is known about recent developments in the maturity structure of corporate and government debt. Studies such as Brunnermeier (2009), Krishnamurthy (2010), and Gorton, Metrick, and Xie (2015) document that financial firms shortened their debt maturity structure during the recent crisis. However, with few exceptions that study corporate debt issuances and syndicated loans (Cortina-Lorente, Didier, and Schmukler 2016, 2017; World Bank 2015),[3] little attention has been paid to recent developments in the maturity structure of debt among nonfinancial firms.[4] Moreover, we are not aware of any study that looks at recent trends in the maturity structure of sovereign debt. Also, an updated analysis of the determinants of debt maturity for firms and governments is lacking.[5,6]

The maturity structure of debt is important because it can influence the likelihood of rollover crisis. Short-term debt—typically defined as that maturing within a year—exposes borrowers to rollover risk (where the terms of financing are renegotiated to the detriment of the borrower) due to self-fulfilling runs or a deterioration in borrowers' economic prospects or global factors. An extensive literature has shown that elevated levels of short-term debt are associated with a higher incidence of crises (see Brunnermeier 2009; Eichengreen and Hausmann 1999; Gourinchas and Obstfeld 2012; Jeanne 2009; Lane and Milesi-Ferretti 2012; Raddatz 2010; Rodrik and Velasco 2000; Rose and Spiegel 2011; Tirole 2003).[7]

[3]These studies examine corporate debt dynamics across four different debt markets (domestic and international bonds and syndicated loans), during both tranquil and financial crisis periods at home and abroad. The first two, in particular, compare the behavior of large versus small firms.

[4]A study by Demirgüç-Kunt, Martinez-Peria, and Tressel (2015) uses corporate balance sheet data to examine the evolution of firms' leverage and long-term debt (defined as debt with residual maturity of more than a year) to total debt ratios during the GFC and its immediate aftermath, comparing the experience of small- and medium-sized enterprises, large nonlisted firms, and listed companies.

[5]A small section of the October 2015 *Global Financial Stability Report* (IMF 2015) looks at the determinants of the maturity of corporate debt issuances but ignores other sources of corporate financing such as syndicated and nonsyndicated bank loans. Also, the analysis focuses only on firms (hence, ignoring sovereign debt) and is restricted to EMDEs.

[6]There are a series of studies before the GFC that examine the role of corporate characteristics in driving the maturity composition of corporate debt. Many have focused on the experience of US firms (Barclay and Smith 1995; Custódio, Ferreira, and Laureano 2013; Guedes and Opler 1996; Highfield 2008), while others consider the role of country characteristics using data for firms across countries (Demirgüç-Kunt and Maksimovic, 1999).

[7]On the other hand, Diamond and Rajan (2001a) argue that short-term debt could be an endogenous response to the weakness of the underlying economies and, therefore, a symptom of crises rather than a cause. Relatedly, Benmelech and Dvir (2013) find that banks with greater rollover risk during the East Asian financial crisis did not experience higher default rates. They argue that banks used short-term debt because of the crisis, but the crisis does not seem to have been caused by short-term debt.

Debt maturity has also been shown to have important real effects. During the GFC, firms that had a larger share of their debt maturing in the short-term suffered sharper contractions in investment relative to firms that did not have debt that needed to be rolled over in the short run (Almeida et al. 2012; Duchin, Ozbas, and Sensoy 2010; Duval, Hong, and Timmer 2017).

This paper analyzes the evolution and determinants of original debt maturity and the use of short-term debt across countries. To do so, we put together and analyze a variety of data sets. We start by examining aggregate external (that is, held by nonresidents) and international (that is, issued overseas) debt statistics, encompassing all sectors.[8] Next, we focus on the maturity of sovereign and corporate debt, using granular data on sovereign and firms' bond issuances and corporate syndicated loans.[9,10] We complement the information on sovereign debt issuances with country-level data on the share of short-term sovereign debt. While the issuance data offers more detailed information on maturity, the coverage of short-term issuances is less reliable relative to the country-level data available. Finally, to examine the structure of corporate liabilities, we also use balance sheet information to calculate the share of short-term debt held by firms. Because only a few large firms issue bonds or borrow in the syndicated loan market (Cortina-Lorente, Didier, and Schmukler 2017; IMF 2015), looking at corporate balance sheets is important to gain a more complete understanding of the use of short-term debt by firms.

This paper focuses on two main issues related to debt maturity, tackling several policy relevant questions:

- *Recent trends.* What has been the path of sovereign and corporate debt maturity, measured at origination, in recent decades? Are there differences in debt maturity among AEs and EMDEs? Did debt maturity change during crises (for example, after the Asian crisis and the GFC)?
- *Drivers of debt maturity.* What factors underpin the maturity structure of sovereign and corporate debt? What is the role of corporate characteristics, country-level variables, and global factors?

The rest of the paper is organized as follows. The next section summarizes the main explanations provided by theory for the use of short-term debt.

[8]Catão and Milesi-Ferretti (2014) show that the ratio of external debt to GDP is a significant predictor of external debt crises.

[9]Due to lack of adequate data, this paper does not analyze the maturity structure of household debt.

[10]It should be noted that while the residual maturity of the stock of debt is mostly influenced by past decisions and factors, the maturity at origination is determined by current conditions. Thus, studying maturity at origination allows for a more direct analysis of the borrower's motivations for using short-term financing and of the impact of country and global conditions. Moreover, there is more complete and granular data on the maturity of sovereign and corporate debt at origination than there is data on the residual maturity of debt.

The following section explores recent trends in debt maturity and the use of short-term debt, focusing on sovereign and corporate debt. The penultimate section presents evidence on the factors explaining the recent behavior of debt maturity among sovereigns and firms. The final section concludes and discusses policy implications.

CHAPTER

2 Explanations for the Use of Short-term Debt

Given that short-term debt increases the likelihood and severity of rollover crises, why do borrowers take on short-term debt?[1] The literature suggests several explanations for the use of short-term debt that we discuss below.

Short-term debt is cheaper than long-term debt because lenders prefer liquid and safe assets (Broner, Lorenzoni, and Schmukler 2013; Krishnamurthy and Vissing-Jorgensen 2015).[2] Therefore, because short-term debt can be used to reduce borrowing costs, borrowers may choose to use short-term debt, even when this increases their exposure to rollover crises.[3]

Borrowers might prefer short-term debt to match the maturity of their liabilities to that of their assets (Hart and Moore 1995). Thus, for example, firms might use short-term loans to finance working capital and long-term debt to finance fixed assets.

Information asymmetries increase the incentives to use short-term debt among risky borrowers (Diamond 1991; Flannery 1986). Issuing short-term debt allows risky borrowers to signal that they have favorable private information about future outcomes, which in turn can result in lower borrowing costs.[4] This argument may also force borrowers with unfavorable private

[1]The costs of using short-term debt have often led to the recommendation that countries decrease their exposure to rollover problems by lengthening the maturity structure of their liabilities (Cole and Kehoe 2000; Corsetti, Pesenti, and Roubini 1999; Eichengreen and Hausmann 1999; Feldstein 1999; Furman et al. 1998; Obstfeld 1998; Radelet and Sachs 1998; Sachs, Tornell, and Velasco 1996).

[2]Note that while lenders could confront liquidity needs by selling long-term bonds in secondary markets, the price of these bonds is volatile and typically lower when lenders face liquidity needs.

[3]Short-term debt is cheaper (exhibits lower yields than long-term debt) in normal times. However, in the run-up to a debt restructuring Asonuma, Niepelt, and Ranciere (2017) show that short-term debt becomes more expensive and suffers larger haircuts.

[4]Diamond (1991) discusses the possibility of a nonmonotonic relation between debt maturity and the borrower's credit rating: a borrower with positive private information and a lower credit rating could choose longer maturities to prevent excessive liquidations (see also Barclay and Smith 1995; Berger et al. 2005).

information to issue short-term debt to avoid the stigma associated with long-term debt.

Short-term debt helps to discipline borrowers by reducing incentives for suboptimal risk taking that arise from agency costs due to conflicts of interest between borrowers and lenders (Jensen and Meckling 1976; Myers 1977). When firms borrow, they have to share the benefits from undertaking profitable investment projects with bondholders. This creates an incentive for firms to invest suboptimally. Since short-term debt exposes borrowers to larger rollover needs, it incentivizes borrowers to take actions in the interest of lenders and, hence, avoid investing suboptimally (Calomiris and Kahn 1991; Diamond and Rajan 2001b; Jeanne 2009).

Short-term debt also mitigates the risky borrowers' debt dilution problem. Debt dilution refers to the reduction in the value of existing debt triggered by the issuance of new debt (Arellano and Ramanarayanan 2012; Bizer and DeMarzo 1992; Chatterjee and Eyigungor 2012; Detragiache 1994; Hatchondo and Martinez 2009; Kletzer 1984; Niepelt, 2014; Tirole 2002). Issuing new debt can dilute the value of existing debt because it increases either the probability of default or the expected loss given default. The debt dilution problem arises because borrowers cannot commit to a level of future borrowing and debt is priced by rational investors. Rational investors anticipate that additional borrowing in the future will lower the price of the debt they buy and, therefore, they offer a lower price for debt today. Borrowers could benefit from constraining future borrowing because this could increase the price at which they can sell their debt. However, borrowers are often unable to constrain future borrowing, creating the debt dilution problem. By using short-term debt, borrowers commit to minimizing the debt dilution problem.[5]

Short-term debt might also arise due to borrowers' inability to commit to a maturity structure. Brunnermeier and Oehmke (2013) describe a "maturity rat race" in which borrowers may have an incentive to issue short-term debt because this dilutes long-term creditors. In their setup, there is no intrinsic benefit from issuing short-term debt, and long-term debt is always a superior instrument. However, short-term debt is senior to long-term debt and the borrower cannot commit to issuing only long-term debt. Anticipating this behavior, lenders are reluctant to buy long-term debt and prefer short-term debt.[6]

[5]Using simulations of a structural model, Hatchondo, Martinez, and Sosa Padilla (2016) find that without the debt dilution problem, a government would increase the average duration of sovereign debt by almost two years (thus mitigating its exposure to rollover risk).

[6]Note that in the model proposed by Brunnermeier and Oehmke (2013), there is no problem that short-term debt helps mitigate. Short-term debt only arises in equilibrium because borrowers are unable to

In the case of governments, short-term debt may also help as a commitment to lower inflation. Missale and Blanchard (1994) explain that since the rewards from unexpected inflation are increasing in debt maturity, to keep their low-inflation pledge credible, governments may need to lower the maturity of their local currency debt. Relatedly, Rajan and Tokatlidis (2005) argue that contractual mechanisms such as demandable or short-term debt might arise as a result of weak institutions that fail to protect investors during downturns.

Short-term debt may be used excessively from a country's perspective. The previous arguments provide reasons for a preference for short-term debt by individual borrowers and lenders. However, individuals may not internalize that by choosing a shorter maturity structure they expose the country to greater risk. Such externalities may justify policy interventions to reduce short-term debt.

commit ex ante to longer maturities. Hence, in this model using short-term debt reduces welfare. In contrast, in the explanations for the use of short-term debt mentioned in the debt dilution literature, short-term debt is welfare enhancing.

CHAPTER

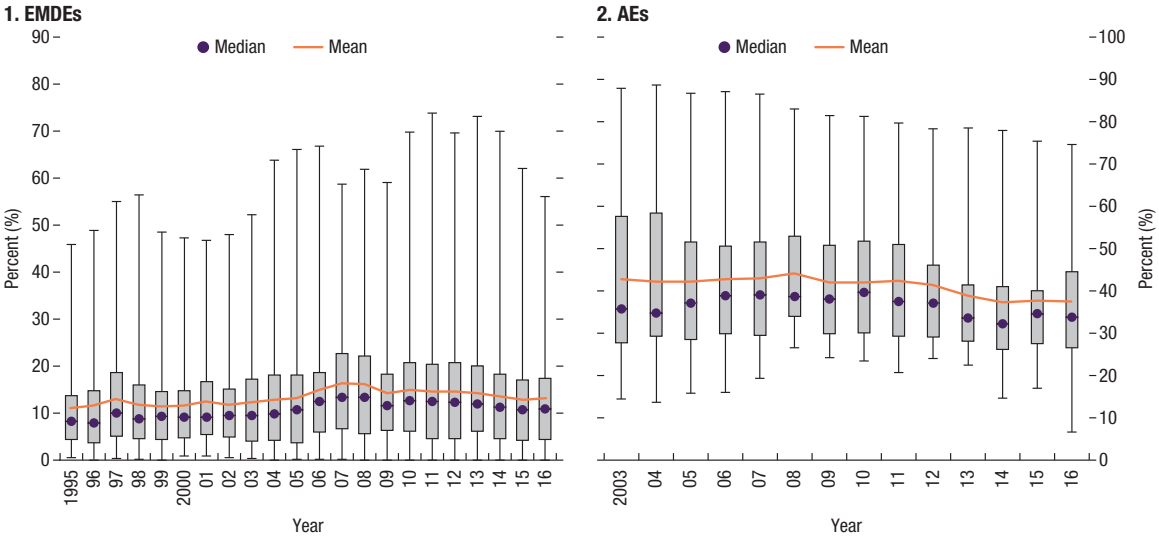
3 Recent Trends in Debt Maturity and the Use of Short-term Debt

Data on the evolution of short-term debt across countries are hard to come by and existing data sets have limitations. Financial accounts, also commonly referred to as flow of funds data, are valuable to look at the use of short-term debt across countries and over time (see Box 1). Such data capture the volume and maturity of net new borrowing by different agents in the economy (that is, government, households and nonprofits, nonfinancial corporations and financial corporations), as well as the amount and maturity of the debt outstanding. While such data exist for developed Organisation for Economic Co-operation and Development countries, these data are not readily available at a broader international level. Hence, we focus on two more commonly available, but imperfect, measures of the use of short-term debt at the country level: the share of external debt that is short term and the share of debt issued in international markets that is short term.[1] The first series comes from the World Bank Debt Statistics and captures short-term relative to total debt held by nonresidents, regardless of where it is issued. The second series, collected by the Bank for International Settlements, measures the share of outstanding debt issued short term in international markets (that is, outside from the borrower country), irrespectively of who holds it (that is, residents or nonresidents).

The share of external debt that is short term increased prior to recent crises both among AEs and EMDEs (Figure 1).[2] For the latter, data available since 1995 show the median share of short-term external debt peaking in 1997 during the Asian crisis, rising from 8 to 10 percent in a year. The share of short-term external debt also trended upward before the GFC, rising from 10 percent in 2005 to 13 percent in 2008. Data for AEs is only available since 2003, but also shows a rising trend prior to the GFC. Among AEs, the

[1]Both short-term debt shares capture debt with an original maturity equal to or less than a year.
[2]Number of EMDEs and AEs included in Figure 1 are 100 and 31, respectively.

Figure 1. Share of Short-term External Debt to Total External Debt



Source: World Bank Debt Statistics.
Note: Boxes mark the interquartile range; vertical lines go from the 10th to the 90th percentile. AEs = advanced economies; EMDEs = emerging market and developing economies.

median share of short-term external debt rose from 35 percent in 2004 to 39 percent in 2008.

The share of short-term outstanding international debt also peaked before recent crises in AEs and selected EMDEs. Among AEs, for which data on international debt is more systemically available, the share of short-term outstanding international debt rose from 5 to almost 7 percentage points between 2005 and 2007 (Figure 2).[3] For EMDEs, the Bank for International Settlements only provides maturity data on international debt securities for a handful of countries, yet these are among the largest economies, namely Argentina, Brazil, China, Mexico, Russia, and South Africa (Figure 3). Short-term debt tended to increase prior to crises; for example, it did so during the 1994–95 Tequila crisis, the 1997 Asian crisis, and, to a smaller degree, the GFC. In the case of China, short-term debt has also risen significantly in recent years.

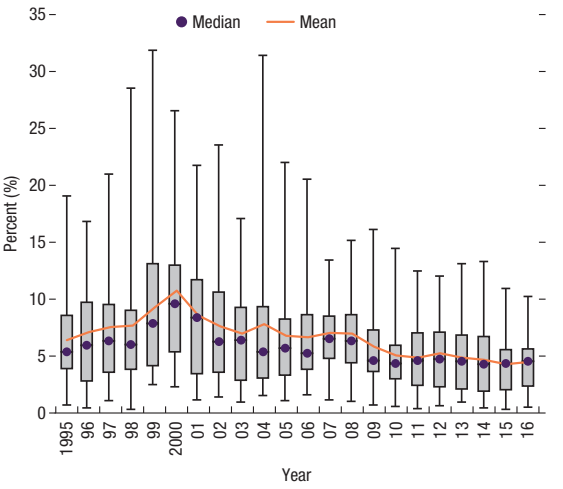
To go beyond aggregate data on short-term debt, we analyze the maturity structure of sovereign and corporate debt, using several separate data sets.[4]

[3]Countries included in Figure 2 are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, South Korea, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

[4]See Appendix I for a description of each data set. It is important to note that the figures on corporate bond and syndicated loan issuances refer to those from a sample that is matched with corporate balance sheet data from Worldscope, so that in the analysis of the determinants of maturity we can control for corporate characteristics.

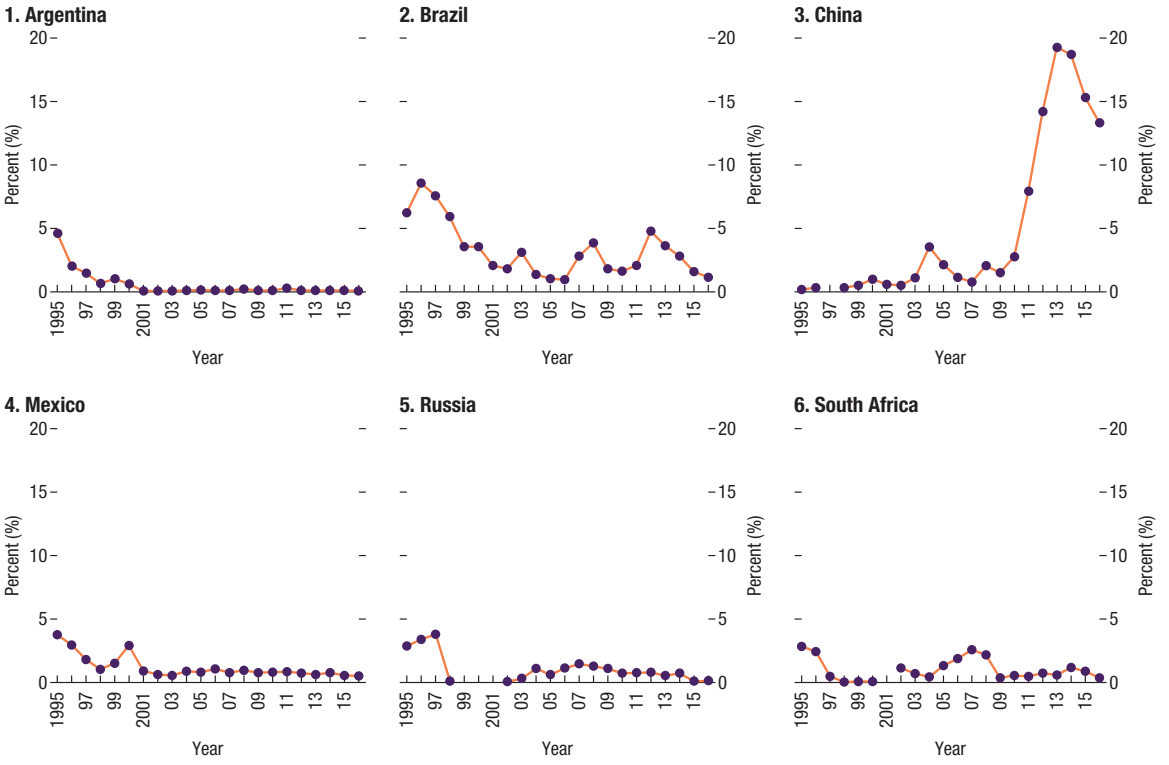
For sovereigns, we use granular data on sovereign bond issuances from Dealogic DCM Analytics. These data include central government bond issuances in local and foreign markets, denominated in domestic and foreign currency. For each issuance covered in the data set, we have information on the maturity at origination. The problem with these data is that the provider does not systematically cover all

Figure 2. Share of Short-term International Debt to Total International Debt, Advanced Economies



Source: Bank for International Settlements.
Note: Boxes mark the interquartile range; vertical lines go from the 10th to the 90th percentile.

Figure 3. Share of Short-term International Debt to Total International Debt, Emerging Market and Developing Economies



Source: Bank for International Settlements.

short-term issuances.[5] Hence, we complement this analysis with country-level data on short-term sovereign debt collected by Jeanne and Guscina (2006; 2014 update) for EMDEs and by Abbas et al. (2014) for AEs. For firms, we examine the maturity of bond issuances and syndicated loan deals. These data, however, are likely to capture the maturity of debt at origination for the larger firms that can access these markets. Moreover, in the case of corporate bond issuances, as with sovereign bond issuances, the coverage of short-term issuances is not systematic. Hence, to complement these data, we also gather corporate balance sheet data[6] to examine the share of short-term debt used by firms. There are two advantages to using balance sheet data. First, balance sheets should systematically include all liabilities and not only debt financing provided by bond and syndicated loan markets. Second, the data we use allow us to examine the share of short-term debt used by firms of all sizes, including small- and medium-sized enterprises (SMEs) that are less likely to issue bonds or to obtain syndicated bank loans.[7] Based on these data sets, we present stylized facts regarding the maturity structure of government and corporate debt. Except for the sovereign debt data from Jeanne and Guscina (2006; 2014 update) and Abbas et al. (2014) that cover a smaller sample of countries,[8] the analysis of corporate and sovereign debt maturity is based on data for 48 countries during the period 1995 to 2014 (see Table A.1 in the Appendix for country coverage).

Sovereign Bond Issuances[9]

Over the last two decades, governments made significant use of bond markets to finance themselves.[10] Between 1995 and 2014, governments from AEs

[5]Though Dealogic bond data include some issuances with maturity under a year, the database only systematically covers those with maturity over 18 months.

[6]As described in Appendix I, we use Orbis data in this part of the analysis because this source covers listed and nonlisted companies, while Worldscope only covers listed companies.

[7]The drawback of using corporate balance sheet data is that we cannot isolate the share of short-term debt based on original maturity, but rather balance sheet data combines debt that is short-term at origination with long-term debt with residual maturity equal to or less than a year.

[8]From Jeanne and Guscina, we obtain data for 13 of the 23 EMDEs studied in this paper (Argentina, Brazil, Chile, China P.R.: Mainland, Colombia, India, Malaysia, Mexico, Philippines, Poland, Russian Federation, Thailand, Turkey) through 2013. As in the analysis of maturity, we exclude data for the years in which governments were in default (eight observations). From Abbas et al. (2014), we analyze data for 11 of the 25 AEs studied in this paper (Australia, Belgium, Canada, France, Germany, Ireland, Italy, Spain, Sweden, United Kingdom, United States) through 2011.

[9]Sovereign debt here refers to the liabilities of the central government only to both domestic and external creditors. It does not include the liabilities of subnational governments and public-sector entities because such data are difficult to find for most countries.

[10]This statement refers to the central governments in the 25 AEs and 23 EMDEs that are included in our sample. For more details see Appendix I. Note that we exclude data for sovereign default episodes (Asonuma and Trebesch 2016) from our sample. Also, since Dealogic only covers systematically issuances above 18

Table 1. Number and Volume of Government Bond Issuances, 1995–2014

	AEs		EMDEs	
	Number of issuances	Volume (Billions of constant US$)	Number of issuances	Volume (Billions of constant US$)
Domestic market	**8,731**	**15,668.0**	**3,022**	**1,789.5**
Local currency	8,615	15,639.2	2,875	1,736.0
Foreign currency	116	28.7	141	50.6
Mixed currencies			6	2.9
International market	**1,347**	**1,247.4**	**965**	**453.4**
Local currency	547	959.5	79	45.9
Foreign currency	800	287.9	878	401.4
Mixed currencies			8	6.5
Total	**10,078**	**16,915.35**	**3,987**	**2,242.9**

Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

conducted close to 10,000 bond issuances raising approximately US$17 trillion. Those from EMDEs raised close to US$2 trillion through almost 4,000 issuances (Table 1).

Most sovereign bonds were issued in local markets and were denominated in local currencies.[11] This is especially true for issuances from governments in AEs where 92.5 percent of the issuances were issued locally and denominated in local currency. In contrast, among EMDEs, approximately 20 percent of the issuances (both in terms of number and volume) over the last two decades were done in international markets and denominated in foreign currency.

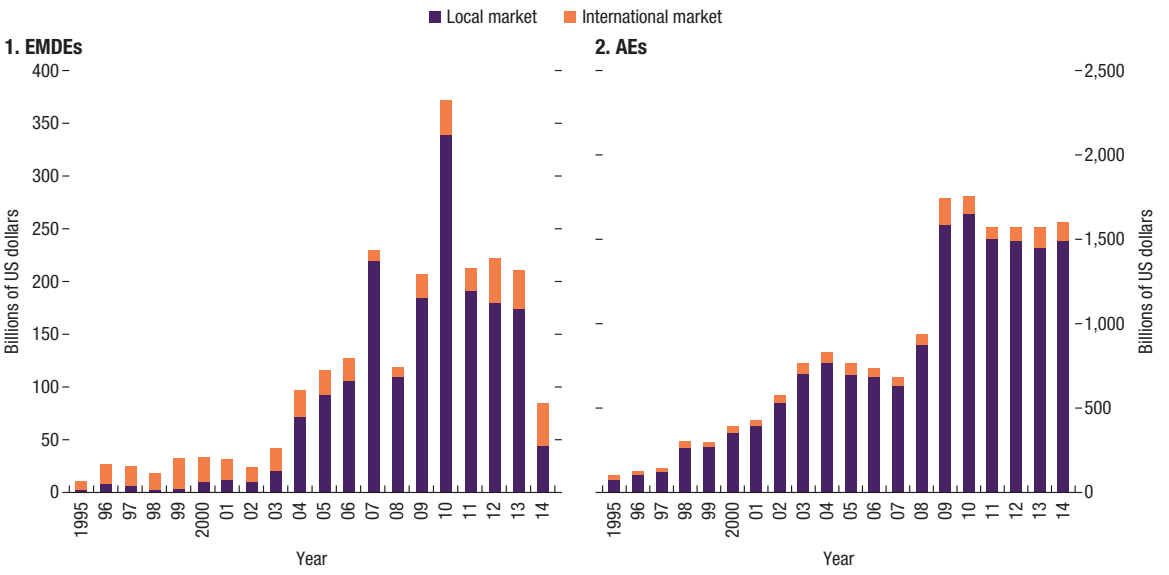
Sovereign bond issuances have grown significantly over time, especially issuances in local markets (Figure 4). In EMDEs, sovereign bond issuances in local markets were on average US$8 billion between 1995 and 2003, while they averaged US$190 billion between 2004 and 2014.[12] In contrast, average issuances in foreign markets only increased from a mean of US$19 billion between 1995 and 2003 to US$26 billion between 2004 and 2014. In AEs, issuances in local markets increased from US$76 billion in 1995 to US$875 billion in 2008. Following the GFC, AE sovereign issuances averaged US$1,530 billion between 2009 and 2014. In contrast, issuances in foreign markets increased from US$26 billion in 1995 to US$62 billion in 2008 and averaged US$107 billion between 2009 and 2014.

months, the numbers underestimate the total issuance activity by sovereigns and provide incomplete information on short-term issuances.

[11]The definitions of international and domestic markets directly follow those in the Dealogic DCM Analytics database, which defines an issuance in international markets when a tranche of an issue is internationally marketed or placed. The remaining ones are defined as issuance in domestic markets. This is different from the concepts of domestic and foreign debt as defined in the International Financial Statistics or Global Development Finance databases, where the criterion is the residency of the debt holder.

[12]In the left panel of Figure 4, both the peak in 2010 and the decline in 2014 are explained by changes in the Dealogic DCM Analytics coverage of Chinese issuances.

Figure 4. Government Bond Proceeds, 1995–2014
(Billions of constant US dollars)



Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EDMEs = emerging market and developing economies.

Governments around the world have issued sovereign bonds with similar maturities. The overall weighted average maturity (by proceeds) for AEs issuances during 1995 to 2014 was 8.1 years and that for EMDEs was 8.5 years (Table 2).[13] Moreover, the cumulative distribution functions of the bonds issued at different maturities were almost identical for both groups of countries (Figure 5).

Governments with an inflationary history and lacking a credible monetary framework face a maturity/currency tradeoff. When issuing local currency debt, governments may be forced to choose shorter maturities to increase the credibility of their low-inflation pledges (Missale and Blanchard 1994).[14] In contrast, the incentives to issue shorter-term debt do not arise for instruments denominated in foreign currency, whose value cannot be diluted due to inflation.[15] However, issuing foreign currency debt also implies a trade-off.

[13]Because Dealogic DCM Analytics does not systematically cover short-term issuances, the numbers we calculated on the weighted average maturity are likely to overestimate the maturity of government issuances. To complement these data, we also report data on the share of short-term debt collected by Jeanne and Guscina (2014) for EMDEs and Abbas et al. (2014) for AEs, which consider all government issuances.

[14]In fact, it is well documented that issuing long-term local currency debt is difficult for governments in EMDEs, a fact often referred to as "Original Sin" (Hausmann and Panizza 2003).

[15]Note also that governments that are forced to issue local currency debt of shorter maturity may want to issue foreign currency debt of longer maturity (to compensate for the shorter maturity of their local currency issuances).

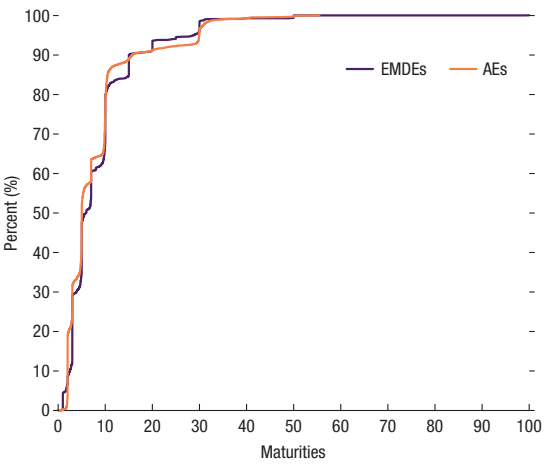
Table 2. Weighted Average Maturity (in years) of Government Bond Issuances, 1995–2014

	EMDEs			AEs		
	Local market	**International market**	**Total**	**Local market**	**International market**	**Total**
Local currency	7.5	8.8	**7.6**	7.7	15.8	**8.1**
	(77.4)	(2.1)	**(79.5)**	(92.5)	(5.7)	**(98.1)**
Mixed currencies	7.0	17.1	14.0			
	(0.1)	(0.3)	(0.4)			
Foreign currency	9.6	12.0	**11.8**	13.9	6.6	**7.3**
	(2.3)	(17.9)	**(20.1)**	(0.2)	(1.7)	**(1.9)**
Total	**7.6**	**11.8**	**8.5**	**7.7**	**13.7**	**8.1**
	(79.8)	(20.2)	**(100.0)**	(92.6)	(7.4)	**(100.0)**

Source: Dealogic DCM Analytics.
Note: The percent share of proceeds raised out of total issuances for each income group is shown below the maturity for each currency/market issuance breakdown. AEs = advanced economies; EMDEs = emerging market and developing economies.

On the one hand, issuing foreign currency debt may allow governments to issue longer maturities, mitigating their exposure to rollover risk. On the other hand, without hedging, issuing debt in foreign currency exposes the issuer to exchange-rate risk. Relative to countries with an inflationary history and without a credible monetary framework, economies that do not suffer from these problems will tend to exhibit lower foreign currency issuances and longer maturities (Eichengreen and Hausmann 1999).

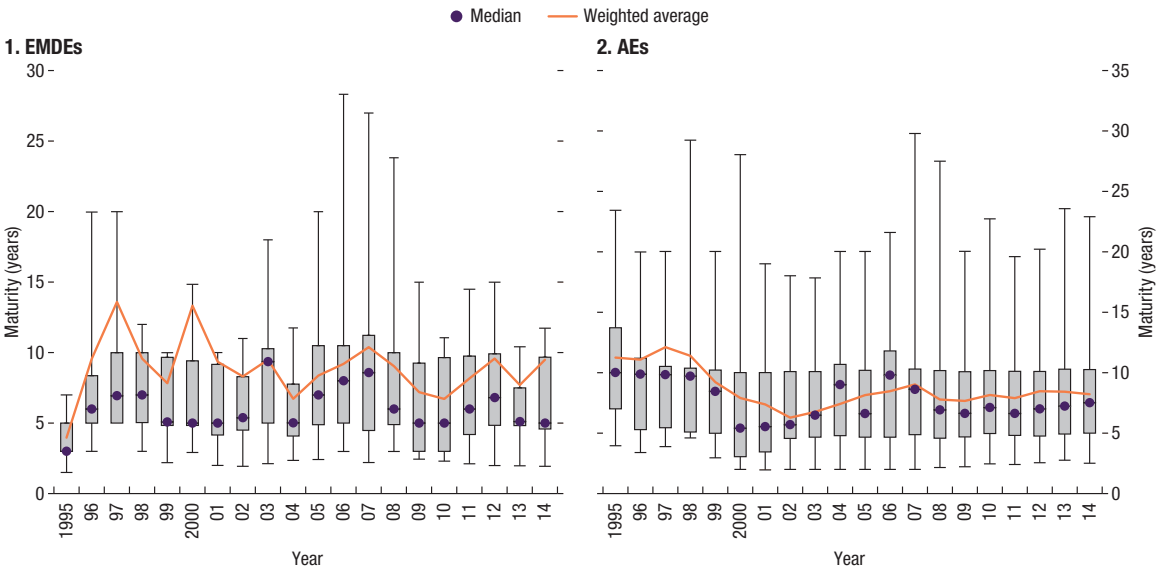
Figure 5. Cumulative Function of Debt Maturities for Government Bonds, 1995–2014



Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EDMEs = emerging market and developing economies.

Consistent with the maturity/currency tradeoff, in EMDEs, the maturity of foreign currency issuances was higher than that of local currency issuances. During the period 1995 to 2014, the weighted average maturity of foreign currency debt for EMDEs was 11.8 years. In contrast, for local currency debt, the weighted average maturity was 7.6 years (see Table 2). In AEs, where many governments do not have inflation credibility concerns and can more easily issue longer-term local currency bonds, local currency issuances in fact had a slightly longer maturity than foreign currency ones: 8.1 years and 7.3 years, respectively (see Table 2). The greater use of foreign currency issuances in EMDEs than in AEs (20 percent versus 2 percent of proceeds

Figure 6. The Maturity of Government Bond Issuances Over Time



Source: Dealogic DCM Analytics.
Note: Boxes mark the interquartile range; vertical lines go from the 10th to the 90th percentile. AEs = advanced economies; EDMEs = emerging market and developing economies.

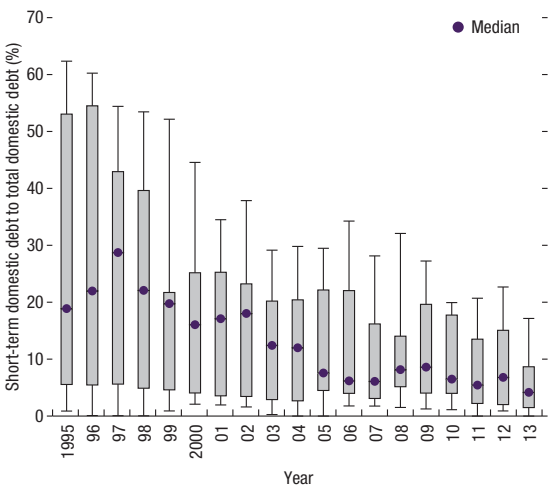
in Table 2) is also consistent with the presence of less credible monetary frameworks in EMDEs.

The maturity of government issuances declined during crises. Among AEs, following the Asian crisis, the median maturity of issuances dropped from 9.8 years in 1997 to 5.4 years in 2000. Similarly, during the GFC, the median maturity of AEs' sovereign issuances declined from 8.6 years in 2007 to 6.6 years in 2009. Among EMDEs, the median maturity of sovereign issuances dropped from 6.9 years in 1997 to 5 years in the aftermath of the Asian crisis and from 8.6 in 2007 to 5.0 years in 2009, following the GFC. A similar pattern is observed for the weighted average maturity for both AEs and EMDEs (Figure 6).

Since 2010, the maturity of large government issuances among EMDEs has trended upward. With a brief decline in 2013, the weighted average maturity of government issuances for EMDEs increased consistently from 6.7 in 2010 to 9.5 in 2014. Instead the weighted average maturity of government issuances in AEs remained flat. It was 8.1 in 2010 and 8.2 in 2014.

Sovereign Debt Ratios

Figure 7. Ratio of Short-term Domestic Debt Over Total Domestic Debt in Emerging Market and Developing Economies



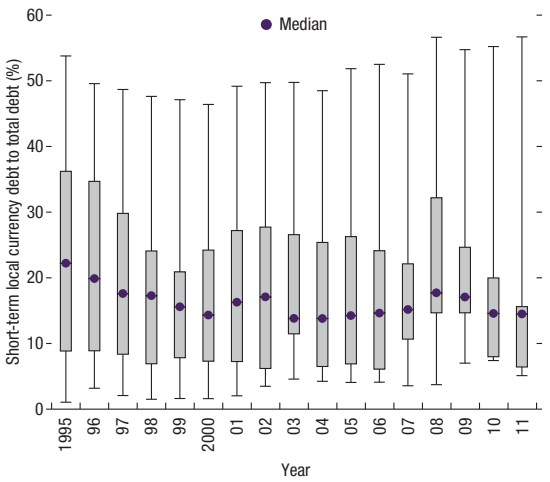
Source: Jeanne and Guscina (2014).
Note: Boxes mark the interquartile range; vertical lines go from the 10th to the 90th percentile. ST = short-term.

Country-level data on short-term sovereign debt ratios helps to complement our understanding of the evolution of sovereign debt maturity based on issuances data. Coverage of short-term debt issuances by proprietary databases is incomplete. Hence, to better gauge the use of short-term debt by governments, we complement our analysis with data collected by researchers from national authorities. Jeanne and Guscina (2006; 2014 update) collect data on the ratio of short-term (original maturity) domestically issued sovereign debt over total domestic sovereign debt for a sample of emerging markets. They define domestic debt by jurisdiction of issuance. They explain that among EMDEs international issuances of short-term debt are negligible, hence they focus on short-term debt issuances in domestic markets. Thus, their ratio is a good approximation of the use of short-term debt by EMDEs. For AEs, we use data collected by Abbas et al. (2014). They gather data on the ratio of local currency short-term (original maturity) sovereign debt over total sovereign debt. They argue that this proxies for the overall short-term debt, since short-term foreign currency debt is insignificant among AEs.

Following an increase during the Asian crisis, the ratio of short-term sovereign debt for EMDEs declined significantly over the last two decades, with a temporary uptick during the GFC. The median short-term debt ratio peaked in 1997 at 29 percent, dropping almost continuously to 4 percent in 2013 (Figure 7). The use of short-term debt increased during the GFC, with the median ratio growing from 6 percent in 2007 to 9 percent in 2009. This pattern is consistent with the post-2002 increase and the GFC decline of the median maturity of bond issuances in EMDEs (see Figure 6).

Among AE sovereigns, the use of short-term debt declined since the mid-1990s with two brief increases during the Long-Term Capital Man-

Figure 8. Ratio of Local Currency Short-term Debt Over Total Debt in Advanced Economies



Source: Abbas et al. 2014.
Note: Boxes mark the interquartile range; vertical lines go from the 10th to the 90th percentile. ST = short-term.

agement crisis and the GFC.[16] The median short-term debt ratio declined from 22 percent in 1995 to 14 percent in 2000, increasing to 17 percent in 2002 and dropping to its pre–Long-Term Capital Management crisis level subsequently (Figure 8). The use of short-term debt also increased during the GFC, with the median ratio growing from 15 percent in 2007 to 17 percent in 2009. This is consistent with the GFC decline of the median maturity of bond issuances in AEs (see Figure 6).

Corporate Bond Issuances

Firms raised significant sums through bond issuances during the last two decades.[17] Between 1995 and 2014, firms from AEs undertook close to 40,000 issuances, raising almost US$7 trillion (Table 3). Most of these issuances were denominated in local currency. While issuances in domestic markets represented a larger share in terms of number of issuances, bonds issued in international markets accounted for more than 60 percent of the total proceeds. Firms in EMDEs raised US$399 billion through more than 4,000 issuances. Among these, issuances in domestic markets and local currency were the most prevalent.

Corporate debt issuances have grown significantly since the mid-1990s and especially after the GFC. The use of local markets has grown over time among firms from EMDEs, while among those in AEs, international issuances have become more prevalent since the 1990s (Figure 9). Bond issuances among firms in EMDEs grew from US$1 to US$55 billion between 1995 and 2014 and those from firms in AEs rose from US$79 to US$680 billion. During this period, the share of issuances in local markets by EMDEs firms grew from 10 percent to 75 percent of the total issuances, while in contrast,

[16]This analysis is based on the data presented by Abbas et al. (2014). They present data until 2011, for 11 of the 25 AEs studied in this paper (Australia, Belgium, Canada, France, Germany, Ireland, Italy, Spain, Sweden, United Kingdom, United States). They present the ratio of local currency short-term debt (original maturity) over total debt.

[17]Data on the number and volume of issuances refer to the 48 countries considered in the sample and is restricted to those firms for which issuance data could be matched with balance sheet information that is used in regression analysis of determinants of maturity. See Table A.1 for details.

Table 3. Number and Volume of Corporate Bond Issuances, 1995–2014

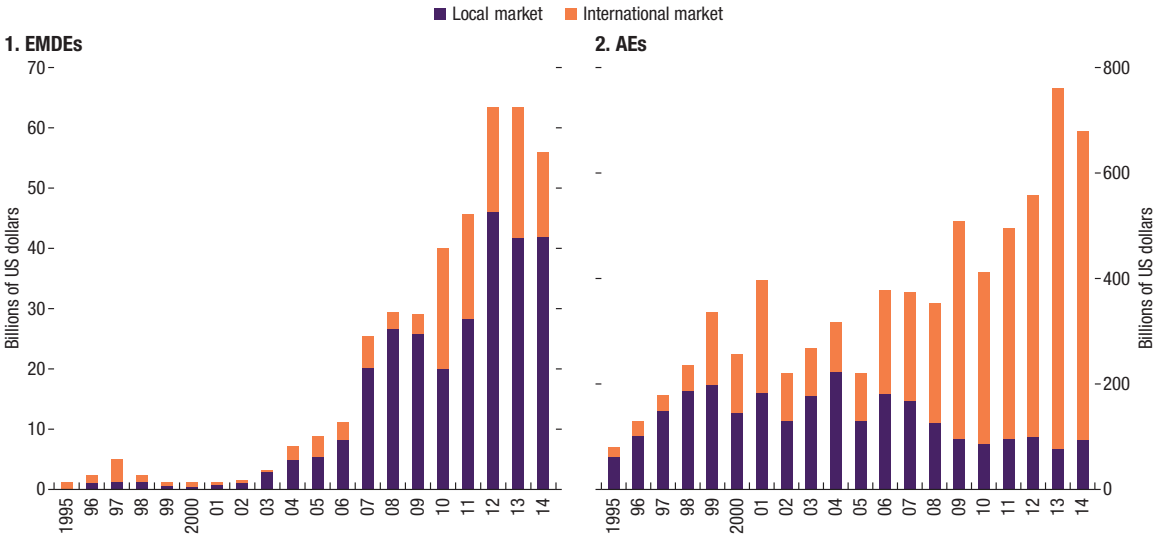
	AEs		EMDEs	
	Number of issuances	Volume (Billions of constant US$)	Number of issuances	Volume (Billions of constant US$)
Domestic market	**27,076**	**2,713.9**	**3,712**	**279.2**
Local currency	22,239	2,405.3	3,393	260.1
Mixed currencies	71	15.0	27	1.0
Foreign currency	4,829	299.9	294	18.3
International market	**11,356**	**4,442.9**	**600**	**119.8**
Local currency	7,132	3,377.8	31	6.4
Mixed currencies	214	197.9	7	2.9
Foreign currency	4,008	867.2	562	110.5
Total	**38,432**	**7,156.7**	**4,312**	**399.0**

Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

that for AEs fell from 78 percent to 14 percent, as international issuances became more prominent.

While the weighted average maturity of corporate bond issuances in AEs is higher than that in EMDEs, the latter can obtain longer maturities by issuing foreign currency debt in international markets. Over the last two decades, the maturity of corporate bond issues averaged 9.7 years for firms in AEs and 8.2 years for those in EMDEs (Table 4). The difference in maturity was larger for local market issuances, where maturity averaged 9.3 for firms in AEs and 6.7

Figure 9. Corporate Bond Proceeds, 1995–2014
(Billions of constant US dollars)



Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

Table 4. Weighted Average Maturity of Corporate Bond Issuances, 1995–2014
(In years)

	EMDEs			AEs		
	Local market	International market	Total	Local market	International market	Total
Local currency	6.7	10.7	6.8	9.5	10.2	9.9
	(65%)	(2%)	(67%)	(34%)	(47%)	(81%)
Mixed currencies	4.9	6.8	6.3	7.7	10.4	10.3
	(0%)	(1%)	(1%)	(0%)	(3%)	(3%)
Foreign currency	6.9	11.9	11.2	7.9	9.0	8.7
	(5%)	(27%)	(32%)	(4%)	(12%)	(16%)
Total	**6.7**	**11.7**	**8.2**	**9.3**	**10.0**	**9.7**
	(70%)	(30%)	(100%)	(38%)	(62%)	(100%)

Source: Dealogic DCM Analytics.
Note: The percent share of proceeds raised out of total issuances for each income group is shown below the maturity for each currency/market issuance breakdown. AEs = advanced economies; EMDEs = emerging market and developing economies.

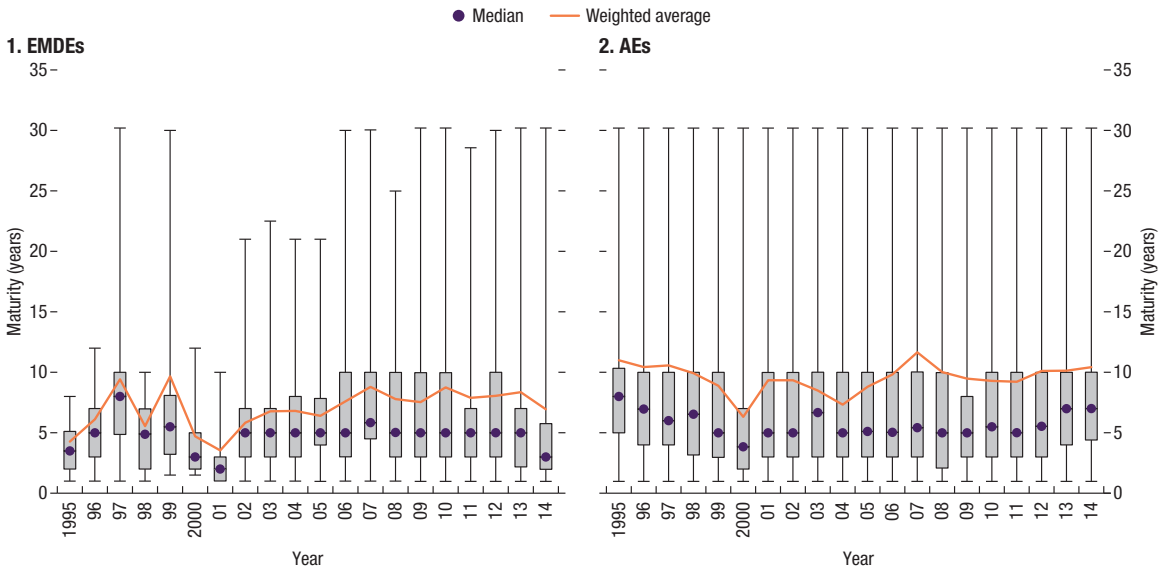
for firms in EMDEs. In contrast, the maturity of international market issuances averaged 11.7 years for firms in EMDEs and 10 years for firms in AEs.

Following a decline after the Asian crisis, the average corporate bond maturity remained broadly stable in AEs, but firms in EMDEs saw a gradual lengthening in the maturity of their bond issuances from 2001 until the GFC. The weighted average maturity of bond issuances for EMDE firms rose from 3.5 years in 2001 to 8.8 years in 2007, whereas the average maturity of bond issuances for AE firms fluctuated around 10 years in the same period (Figure 10). Looking at the unweighted median for the period after the Asian crisis, there is no clear trend in the maturity of bond issuances for firms in either AEs or EMDEs (see Figure 10), suggesting that the upward trend in the weighted average maturity in EMDEs is driven by the largest corporate issuances.

Corporate bonds issued in foreign currencies and international markets were the main drivers behind the recent lengthening of maturity in EMDEs. Particularly in the postcrisis period, the average maturity of bonds denominated in foreign currencies continued its precrisis upward trend, rising from 10.1 years in 2007 to 14.6 years in 2014. In contrast, the maturity of local currency bonds declined since 2008 (Figure 11). The behavior of the average maturity of bonds issued in domestic and international markets in EMDEs mimics the pattern of bonds issued in local and foreign currency (Figure 12), reflecting the fact that firms in EMDEs tend to issue local currency bonds in the domestic market and foreign currency bonds in international markets.

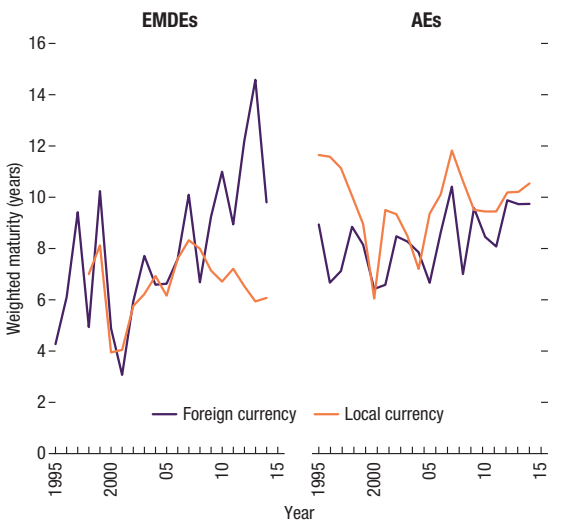
For firms in AEs, the average bond maturity across different markets was not significantly different and followed the aggregate trend. During 1995 to 2000, corporate bonds issued in local currencies and domestic markets experienced a sharp decline in maturities (see Figures 11 and 12). Between 2000 and 2007, maturities across different type of bonds fluctuated around

Figure 10. The Maturity of Corporate Bond Issuances Over Time



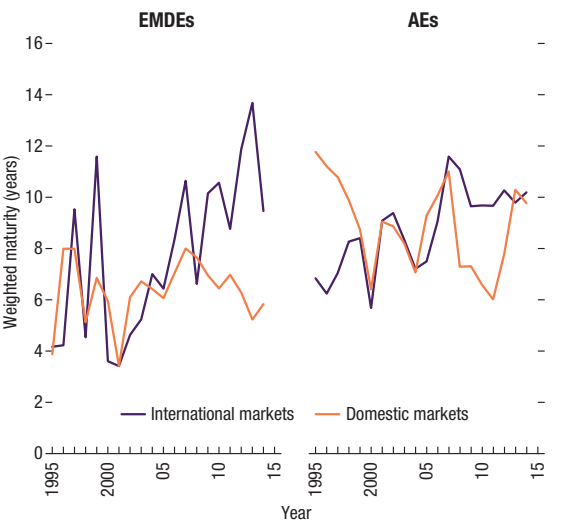
Source: Dealogic DCM Analytics.
Note: Boxes mark the interquartile range; vertical lines go from the 10th to the 90th percentile. AEs = advanced economies; EMDEs = emerging market and developing economies.

Figure 11. Weighted Average Maturities by Currency Composition



Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

Figure 12. Weighted Average Maturities by Market Breakdown



Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

Table 5. Number and Volume of Syndicated Loan Deals, 1995–2014

	AEs		EMDEs	
	Number of deals	Volume (Billions of constant US$)	Number of deals	Volume (Billions of constant US$)
Domestic Lenders	**9,009**	**846.8**	**332**	**46.6**
Local currency	8,792	825.3	276	40.2
Foreign currency	217	21.5	56	6.3
Foreign Lenders	**1,861**	**234.3**	**1,808**	**122.8**
Local currency	884	105.5	33	3.6
Foreign currency	977	128.8	1,775	119.2
Mixed Lenders	**14,116**	**5,776.9**	**552**	**95.4**
Local currency	12,702	5,206.7	96	20.3
Foreign currency	1,414	570.3	456	75.1
Total	**24,986**	**6,858.0**	**2,692**	**264.7**

Source: Dealogic DCM Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

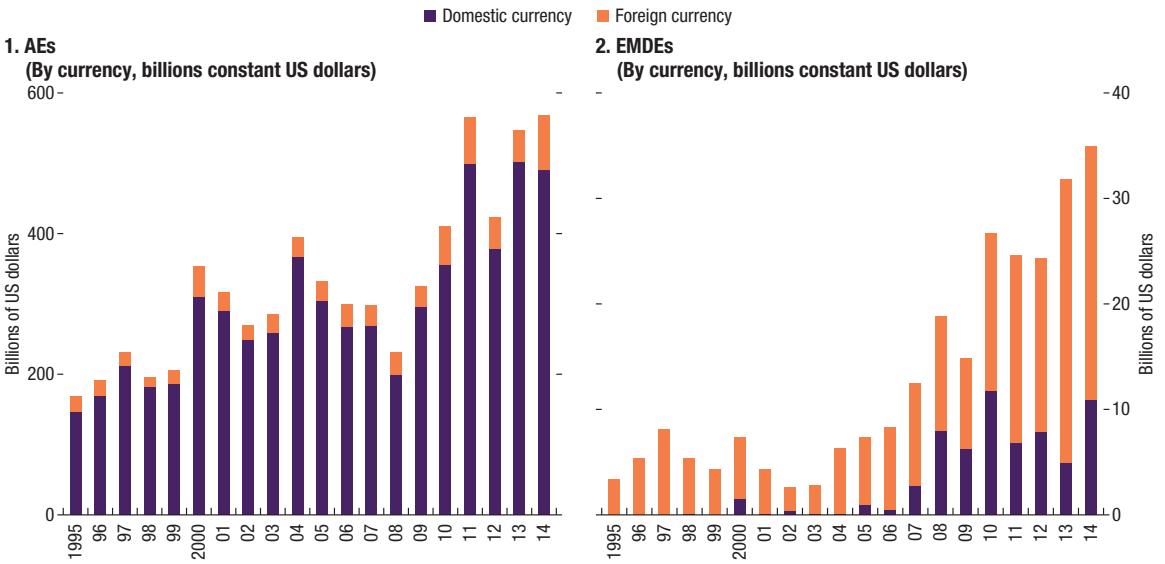
their long-term average. The GFC led to a sharp drop in bond maturities in AE firms, but maturities in all markets have recovered since 2012. Among the different types of bonds, the average maturity of bonds issued in domestic markets experienced the largest decline during the crisis, falling from 11.3 years in 2007 to 6.2 years in 2011 (see Figure 12). Overall, there is not much difference between the trend of the average maturity of bonds issued in local and foreign currencies.

Corporate Syndicated Loans

Syndicated loans were an important source of financing for firms across countries[18] in recent decades, but, while those from AEs borrowed primarily in local currency, EMDE firms relied mostly on loans denominated in foreign currency. Between 1995 and 2014, firms from AEs received almost US$7 trillion in loans through almost 25,000 syndicated loan deals (Table 5). Approximately 90 percent of the loans (in terms of proceeds) were denominated in domestic currency, independently of the type of bank. In contrast, firms from EMDEs borrowed US$265 billion through almost 3,000 loan deals; more than half of these loans were denominated in foreign currency and, primarily, extended by foreign lenders. In fact, it is striking that foreign lenders made almost no loans in domestic currency. The pervasive use of foreign currency financing by EMDEs is often referred to as original sin (Eichengreen and Hausmann 1999) and continues to be a source of concern (Acharya et al. 2015; Caballero, Panizza, and Powell 2014, 2016; Chui, Kuruc, and Turner 2016; IMF 2015).

[18]Recent studies estimate that syndicated loans account for roughly one-third of total outstanding loans (Cerutti, Hale, and Minoiu 2015; Huang 2010; Ivashina and Scharstein 2010).

Figure 13. Syndicated Loan Amounts Over Time, 1995–2014



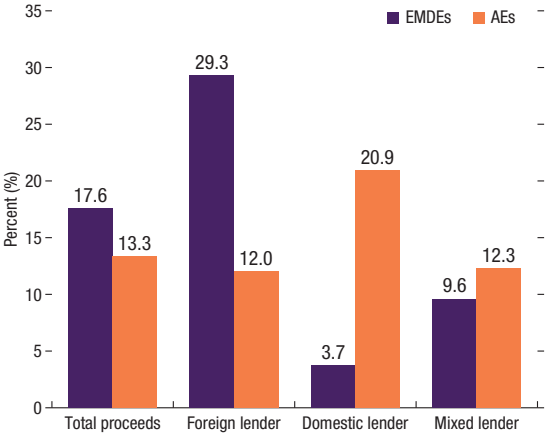
Source: Dealogic Loan Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

Together with a significant overall increase in syndicated loans to firms across countries, another important trend has been the growth in local currency financing for firms in EMDEs. The total amount borrowed[19] through syndicated loans by firms from AEs reached US$567 billion in 2014 compared to its level of US$168 billion in 1995, more than a three-fold increment (Figure 13). Much faster growth could be observed for firms in EMDEs, where syndicated loans rose more than 10-fold, from US$3 billion in 1995 to US$35 billion in 2014. When controlling for economic growth, the total syndication volume as a share of GDP tripled in the last two decades for both AEs and EMDEs. Though most syndicated loans to EMDE firms were denominated in foreign currency, financing in local currency increased significantly since the mid-1990s, going from a negligible amount to US$10 billion or 30 percent of loans in 2014.

Although the share of short-term syndicated loans was relatively similar for EMDEs and AEs, there were significant differences by type of lender across income groups. Considering all syndicated loans, the share of short-term loans was 17.6 percent for EMDEs and 13.3 percent for AEs (Figure 14). Among foreign lenders, the difference in the share of short-term debt between EMDEs and AEs was much larger: 29.3 percent for EMDEs and

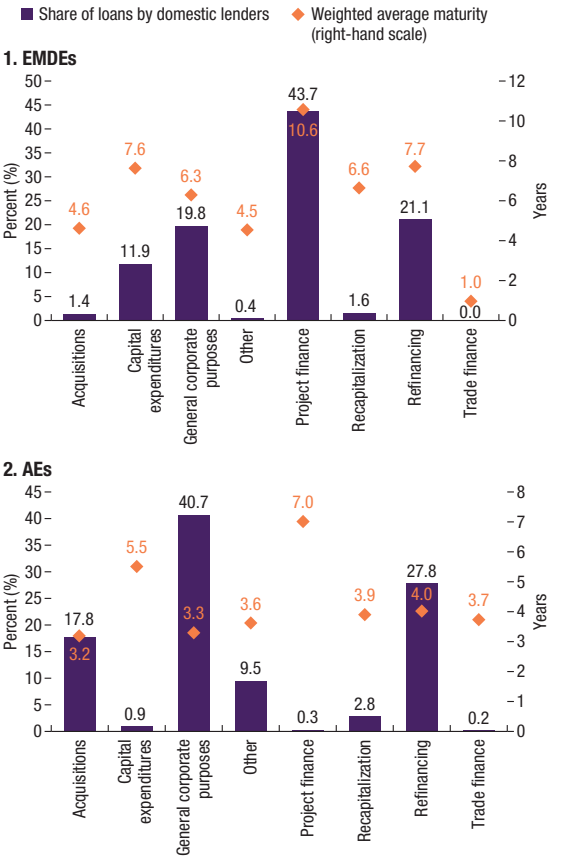
[19]The total amount borrowed is the aggregated dollar value of loans over a sample of financial and nonfinancial firms in 48 countries. Please see Appendix I for more detailed information.

Figure 14. Short-term Share of Syndicated Loans, 1995–2014



Source: Dealogic Loan Analytics.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

Figure 15. The Average Maturity and Share of Loans by Purpose of the Loan



Source: Dealogic Loan Analytics.
Note: AEs = advanced economies; EDMEs = emerging market and developing economies.

12 percent for AEs. In contrast, among domestic lenders, the use of short-term debt was more prevalent in AEs (20.9 percent) than in EMDEs (3.7 percent). Among loans that involve a mixture of domestic and foreign lenders the share of short-term debt was slightly higher for AEs (12.3 percent) relative to EMDEs (9.6 percent).

Despite a slightly more prevalent use of short-term loans by firms in EMDEs, the average weighted maturity of syndicated loans was higher among these firms, driven by a more intensive use of syndicated loans for project finance from domestic lenders. The average weighted maturity of loans during the period 1995 to 2014 was 3.9 years for firms in AEs and 5.5 years for those in EMDEs (Table 6). While the average weighted maturity of loans obtained from foreign lenders was the same (4.6 years) for firms in AEs and EMs, the maturity of syndicated loans from domestic lenders was significantly higher for firms from EMs (8.6 years) relative to those from AEs (3.6 years). A factor that could explain these differences in maturity is the higher share of syndicated loans used for project finance—typically long-term infrastructure projects—from domestic lenders in EMDEs relative to those in AEs (Figure 15).

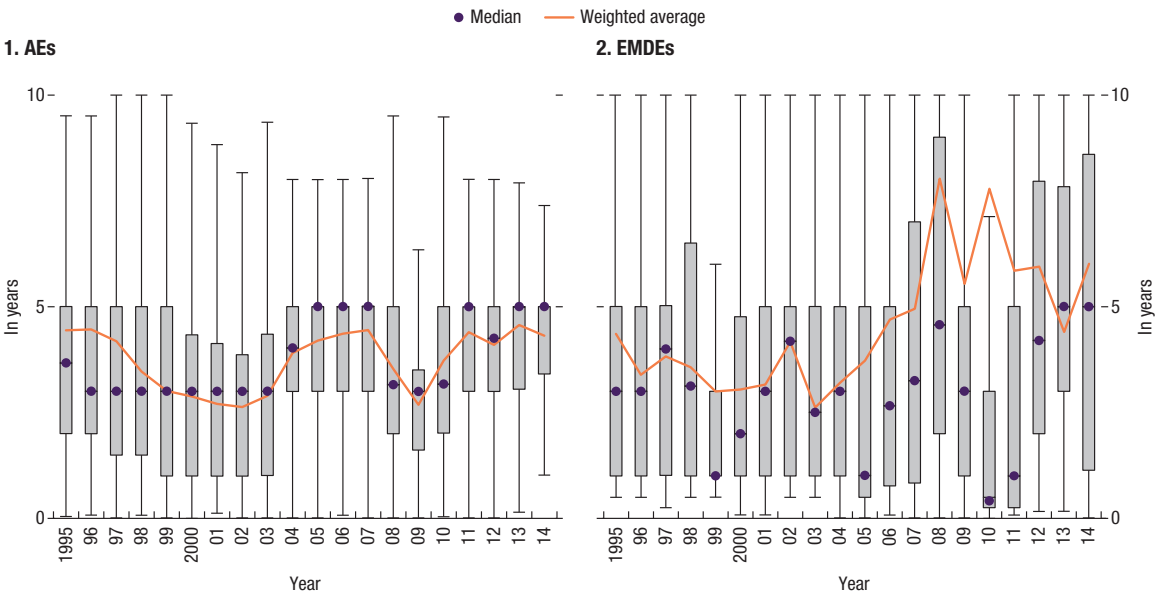
Table 6. Average Weighted Maturity of Syndicated Loans
(In years)

	AEs				EMDEs			
	Foreign Lenders	**Domestic lenders**	**Mixed**	**Total**	**Foreign Lenders**	**Domestic lenders**	**Mixed**	**Total**
Domestic currency	4.7	3.6	3.9	3.8	8.8	8.6	8	8.4
	(2%)	(12%)	(77%)	(91%)	(1%)	(17%)	(8%)	(26%)
Foreign currency	4.5	2.7	4	4	4.4	9	4.2	4.5
	(3%)	(0%)	(6%)	(9%)	(45%)	(2%)	(27%)	(74%)
Total	**4.6**	**3.6**	**3.9**	**3.9**	**4.6**	**8.6**	**5.1**	**5.5**
	(5%)	(12%)	(83%)	(100%)	(46%)	(19%)	(35%)	(100%)

Source: Dealogic Loan Analytics.
Note: The percent share of loans out of total loans for each income group is shown below the maturity for each currency/lender breakdown. AEs = advanced economies; EMDEs = emerging market and developing economies.

Across all countries, the maturity of loans lengthened before the GFC and declined during that episode (Figure 16). In the run-up to the crisis, both the weighted average and median maturity of syndicated loans trended upwards. Among firms in AEs, the median maturity of syndicated loans rose from 3 years in 2003 to 5 years in 2007. For firms in EMDEs, the increase in maturity was more pronounced, with the median maturity rising from 2.5 years in 2003 to 4.6 years in 2008. The rise in the maturity of syndicated loans to EMDEs before the crisis was even sharper, if we consider the average

Figure 16. The Maturity of Syndicated Loans Over Time



Source: Dealogic Loan Analytics.
Note: For comparative purposes, both plots have been adapted from an originally higher scale on the upper adjacent values of maturity to a lower scale. The distribution shows the upper (and lower) adjacent values of maturity, the interquartile range (shown in the boxes), the median, and the weighted average maturity. The weighted average maturity per year is estimated from all issuances pooled by income group each year as the average maturity of each deal issued in that year weighted by the total amount raised in the deal. Similarly, the median maturity and the rest of the statistics in the box plot are estimated from pooled issuances by income group and year. AE = advanced economies; EMDEs = emerging market and developing economies.

Table 7. Corporate Leverage and the Use of Short-term Debt, 2005–2014

	AEs		EMDEs	
	Mean	Median	Mean	Median
Leverage–Debt/Assets (%)	24.98	24.9	20.63	20.3
ST Debt/Total Debt (%)	41.46	37.7	57.74	53.7
ST Debt/Total Assets (%)	5.62	4.1	7.02	6.15

Source: Orbis
Note: advanced economies; EMDEs = emerging market and developing economies; ST = short-term.

weighted maturity. After the crisis unfolded, the maturity of syndicated loans declined across both income groups (although later in the case of EMDEs) and recovered subsequently.[20]

Short-term Debt in Corporate Balance Sheets

Corporate balance sheet data can also be useful to ascertain the maturity structure of corporate debt, since typically only large firms have access to bond markets and obtain syndicated loans (Cortina-Lorente, Didier, and Schmukler 2016; IMF 2015). Hence, gaining a good understanding of how most corporations finance their operations and to what extent they use short-term debt requires looking at firms' balance sheets. We use firms' balance sheet data to analyze corporate leverage and the use of short-term debt. We measure leverage by the debt-to-assets ratio. We assess the use of short-term debt by the share of short-term to total debt, where the numerator includes the sum of financial debt with original maturity equal or less than a year plus the part of long-term financial debt payable within a year. The short-term-debt-to-total-debt ratio captures the maturity composition of debt. We also examine the ratio of short-term debt to total assets. These data come from Orbis and encompass the period 2005 to 2014.[21]

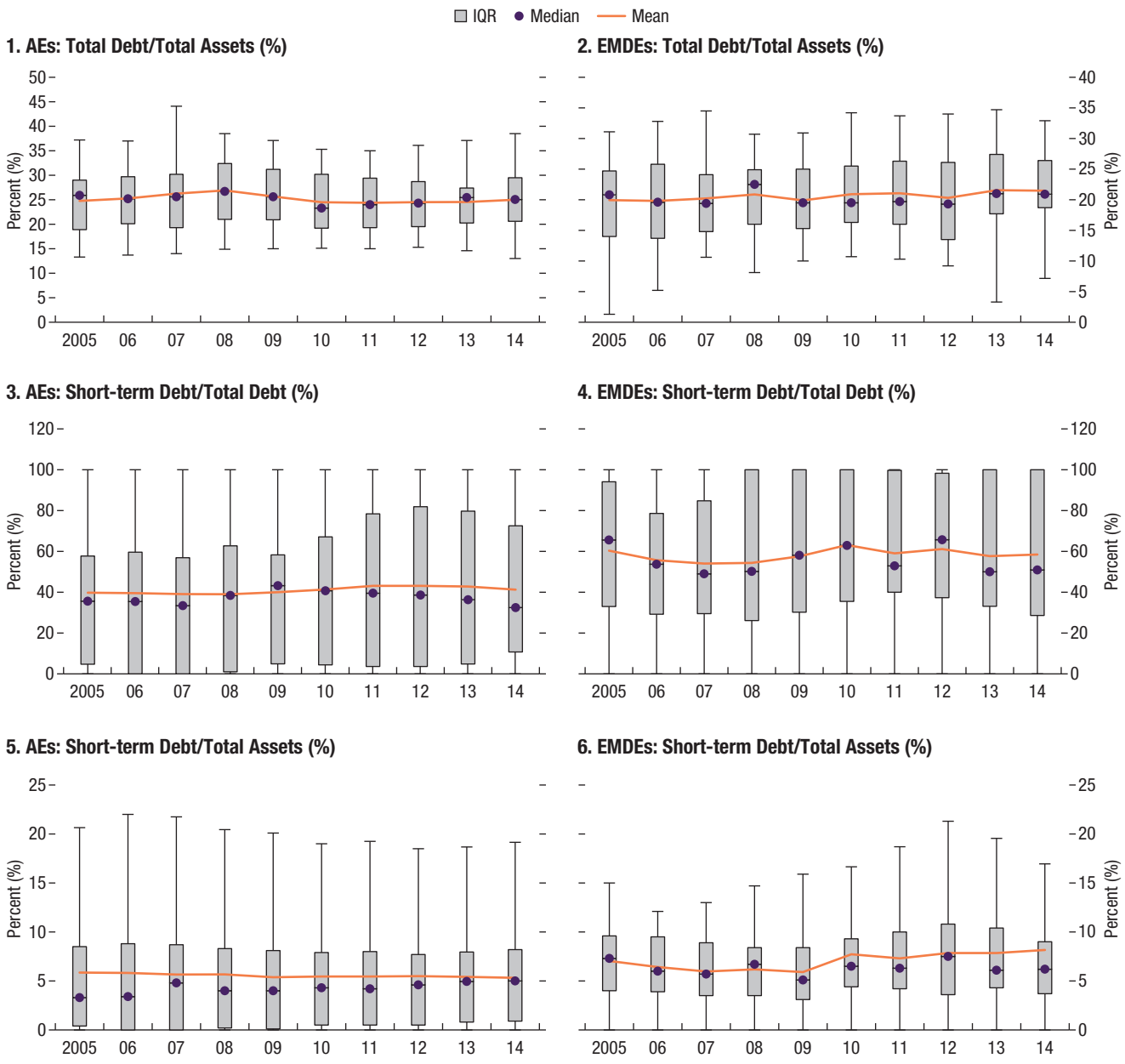
Firms in AEs tend to be more indebted but less reliant on short-term debt than firms in EMDEs. During 2005 to 2014, the median leverage ratios for firms in AEs and in EMDEs were 24.9 percent and 20.3 percent,[22] respectively. The median short-term debt to total debt ratio was 37.7 percent in AEs and 53.7 percent in EMDEs, respectively (Table 7). As a share of total assets, the median short-term debt ratio in AEs (4.10 percent) was also lower than that for firms in EMDEs (6.15 percent). These patterns were the same for the means.

[20]These trends remain if we exclude the main issuers in each income category (that is, China, India and the United States).

[21]See detailed data description in Appendix I.

[22]These ratios are calculated for firms that have debt.

Figure 17. Corporate Leverage and Use of Short-term Debt



Source: Orbis.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies; IQR = interquartile range.

For firms across AEs and EMDEs, leverage first increased and then fell slightly during the GFC but recovered to its precrisis level soon after (Figure 17). The median leverage ratio for AEs rose from 25 percent in 2005 to 26 percent in 2008, dropping to 24 by 2009 at the height of the GFC. The

median leverage rose again to 25 percent by 2012. Among EMDE firms, the median increased from 21 percent in 2005 to 22 percent in 2008 only to drop after the crisis to 20 percent in 2009. The ratio rebounded as of 2013, reaching 21 percent.

The use of short-term debt among firms dropped before the crisis, increased during the GFC, and has generally come down subsequently. The median short-term-to-total-debt ratio for AE firms dropped between 2005 and 2007 from 37 to 34 percent. This ratio increased during the crisis to almost 44 percent in 2009, dropping gradually after that to reach 33 percent in 2014. The median short-term debt ratio for EMDEs dropped from 61 percent in 2005 to 49 percent in 2007. The ratio then rose during the crisis, reaching 63 percent by 2010. Subsequently, the median short-term debt ratio dropped to 53 percent by the end of the sample. In general, the median share of short-term debt to assets conveys a similar picture to that of the ratio of short-term debt to total debt.

CHAPTER

4 The Drivers of Debt Maturity

Theories behind the use of short-term debt discussed in the section "Explanations for the Use of Short-term Debt" and previous empirical studies have several implications for the potential drivers of debt maturity:

- Lower interest rate differentials between long-term and short-term debt instruments, which could reflect accommodative global monetary conditions, should lead to a lengthening of debt maturity. A smaller spread of long-term versus short-term debt instruments makes it relatively less expensive for borrowers to issue long-term debt, hence increasing the maturity of debt issuances.
- Debt maturity should be shorter in periods of increased lenders' risk aversion. This follows from the fact that short-term debt is used in part to accommodate lenders' preference for safe assets (Broner, Lorenzoni, and Schmukler 2013). Hence, we expect maturity to be negatively associated with global measures of investors' risk aversion.[1]
- Shorter maturities should be associated with stronger information asymmetries. In the presence of information asymmetries, which make it difficult for lenders to ascertain a borrower's riskiness, lenders prefer to renegotiate financing frequently and borrowers use short-term debt to signal their quality and commitment to repayment. Thus, we expect to observe shorter maturities for firms that are smaller and have less tangible assets because such firms are more opaque (Berger et al. 2005; Custódio, Ferreira, and Laureano 2013; Demirgüç-Kunt, Martinez-Peria, and Tressel 2015; Magri 2010; Ortiz-Molina and Penas 2008).
- Agency problems that might give rise to suboptimal investment decisions should lead to shorter maturities. Since shorter-term debt exposes borrow-

[1]Perez (2017) develops a model of optimal maturity choice that also predicts a negative correlation between bond spreads and maturity.

ers to larger rollover needs, it incentivizes them to take actions that are in the best interest of lenders and minimize the likelihood of suboptimal investments. Since for high-growth firms the agency costs arising from conflicts between firm owners and lenders are like to be higher,[2] firms with better growth opportunities would tend to borrow at shorter maturities (Barclay and Smith 1995; Billett et al. 2007).

- Maturities should be shorter for riskier borrowers or when a borrower becomes riskier over time.[3]
  - A drop in the borrower's capacity to pay, as measured by lower GDP growth in the case of sovereigns (Sánchez, Sapriza, and Yurdagul 2016) and lower profits for firms (Magri 2010) should be associated with shorter maturities.
  - Country characteristics that help to mitigate the riskiness of debt contracts, including a good institutional environment (with stronger property rights, enforceability of contracts and legal frameworks, and less government corruption) should be associated with the use of longer-term debt by borrowers (Bae and Goyal 2009; Demirgüç-Kunt, Martinez-Peria, and Tressel 2015; Fan, Titman, and Twite 2012; Stulz 2005). Among borrowers from countries with weaker institutions, issuances in foreign markets, which commit borrowers to abide by the laws of foreign jurisdictions, are expected to have longer maturities than those issued in local markets.
  - Holdings of liquid assets help reduce borrower risk and thus favor the use of longer debt maturities.[4] Larger holdings of international reserves are associated with lengthening of the maturity of both private and public external debt (Qian and Steiner 2017).
  - The relationship between the borrower's leverage and debt maturity is unclear. On the one hand, for any borrower, more leverage can be associated with more risk and, hence, shorter maturities. On the other hand, safer borrowers may have access to both more leverage and longer maturities. In the sovereign debt context, differences in debt intolerance (that is, in the relationship between debt levels and sovereign risk) are well

[2]High-growth firms are more likely to face agency problems because they have higher future investment opportunities which, as argued by Myers (1977), are options whose value depends on whether the firm will exercise them optimally. The benefits from undertaking profitable investment projects are split between stockholders and debtholders. At some point, debtholders would capture an amount of the benefits such that a profitable project would not offer stockholders a normal return. In such an instance, stockholders have incentives to invest suboptimally. With more growth opportunities, the conflict between stockholders and debtholders becomes larger.

[3]This can happen both because lenders will be less willing to extend long-term loans and because borrowers might opt for short-term loans either because they will be cheaper or as a way to signal their commitment to repayment.

[4]It could also be that a borrower that wants more liquidity chooses both more liquid assets and longer debt maturities.

documented (Reinhart, Reinhart, and Rogoff 2015; Reinhart, Rogoff, and Savastano 2003). Diamond (1991) argues that highly leveraged firms would be more concerned about excessive liquidations and, therefore, would choose longer-term debt.

- Stronger monetary policy frameworks that mitigate incentives to use unexpected inflation to lower local currency indebtedness allow for local currency debt of longer maturities (Guscina 2008; Hausmann and Panizza 2003). Thus, lower inflation (as the result of stronger monetary frameworks) would be associated with the use of longer-term local currency sovereign debt, at least among countries with weaker monetary frameworks (that is, EMDEs).

Our empirical analysis of maturity distinguishes between sovereign and corporate debt and in each case examines the role of borrower characteristics, macroeconomic variables, and global factors. We estimate reduced form specifications where we ignore the impact of prices to minimize concerns about endogeneity. In the following, we explain the specifications we estimate and discuss the empirical findings.[5]

What Drives Sovereign Debt Maturity?

To analyze the determinants of sovereign maturity at issuance, we conduct several empirical estimations. Using sovereign issuance data, we regress the maturity of each sovereign issuance on (1) issuance characteristics (such as dummies for the currency of denomination and the market of issuance)[6] and (2) country characteristics (GDP growth, debt-to-GDP ratio, reserves-to-debt ratio, inflation, a property rights index, and the share of private credit to GDP) and global factors (high yield bond prices and US term spreads). We estimate results for all countries combined (Appendix Table A.3) and separately for AEs and EMDEs (Appendix Table A.4 and A.5). We conduct estimations including one variable at a time as well as jointly.

The currency and market of issuance affects the maturity of sovereign bonds. Controlling for the market of issuance, local currency bonds tend to be of longer maturity. This result is driven primarily by AEs that can borrow in local currencies in both domestic and international markets. At the same time, foreign market issuances tend to be of longer maturity.

[5]See Appendix II for the specific equations estimated.

[6]We control for the currency of issuance by including a dummy equal to one if the issuance was denominated in the local currency and zero for those issuances denominated in a foreign currency. We control for the market of issuance by including a dummy that takes the value of one if the issuance happened in the local market and zero otherwise.

Positive domestic shocks and lower term spreads are associated with longer maturities, but there are differences in the extent these and other factors matter for sovereign debt maturity in (riskier) EMDEs and (safer) AEs (Appendix Tables A.4 and A.5):

- A higher country growth rate is more significantly associated with longer maturities in EMDEs. This is consistent with positive domestic shocks being more significantly associated with a decline in sovereign risk among riskier borrowers (Neumeyer and Perri 2005), and borrowers choosing longer maturities when they are safer.
- The term spread is a more significant determinant of maturity in AEs. We expect borrowers to increase maturity to take advantage of a lower term spread, as measured by the differences between the yields of US 10-year and 3-month government bonds. However, this is more difficult to do for riskier sovereign borrowers who use shorter maturities as a disciplining device.
- Lower levels of liquid assets are more strongly associated with shorter sovereign bond maturities in EMDEs. The coefficient for reserves is much larger for EMDEs. This indicates that governments in weaker financial positions are forced to shorten the maturity of their debt issuances more in countries that are perceived to be riskier.[7]
- Higher inflation is only significantly associated with shorter maturities in EMDEs. This is probably due to the weaker monetary policy frameworks in these economies. Consistent with the results presented in the section "Recent Trends in Debt Maturity and the Use of Short-term Debt," local currency issuances have longer maturities in AEs and shorter maturities in EMDEs. Inflation credibility concerns that lead to shorter maturities only apply to local currency debt and are typically stronger in EMDEs.

What Drives Corporate Debt Maturity?[8]

We investigate the role of firm, country, and global factors in driving corporate debt maturity. Following the literature on corporate debt maturity, we consider the impact of corporate characteristics such as firm size, leverage, profitability, growth opportunities, and asset tangibility (Barclay and Smith 1995; Billett et al. 2007; Custódio, Ferreira, and Laureano 2013; Magri 2010; Rajan and Zingales 1995). Among the country characteristics and global factors, we include the same ones discussed previously for sovereign

[7]We do not find a significant effect of debt levels on maturity. This is not surprising considering the difficulties in identifying the association between debt levels and risk mentioned previously.

[8]This section focuses on the results combining all countries (Table A.6). We also run separate results for AEs (Table A.8) and EMDEs (Table A.9). Because most of observations come from the former, the results for all countries combined are consistent with those for AEs. For EMDEs, results are significantly weaker.

debt. Finally, in the bond and syndicated loan estimations we include several issuance and deal level variables, respectively. In the case of bond issuances, we include separate dummies taking a value of one for issuances in the local market and for those denominated in local currency. Among the syndicated loan deal variables, we include the number of participants, the number of tranches, dummies to capture the purpose of the loan, a dummy for domestic currency loans, and dummies for the type of lender (foreign, domestic, or mixed).

Corporate characteristics are the most important drivers of corporate debt maturity. In particular, indicators of asset tangibility and corporate profitability are consistently positively associated with debt maturity and negatively related to the share of short-term debt (Appendix Table A.6). Since firms typically seek to match the maturity profile of their assets and liabilities, those with a higher proportion of fixed assets are more likely to use longer-term debt. Moreover, firms with a higher share of fixed assets are better able to meet collateral requirements and can, therefore, secure financing at longer maturities. Similarly, profitable firms are more likely to be perceived as more capable of paying their debts and, hence, are able to obtain long-term financing. Overall, corporate characteristics (corporate fixed effects and corporate-level time-varying variables) account for the largest share of the variance of debt maturity (Appendix Table A.7).

Country characteristics are less consistently associated with corporate debt maturity.[9] After controlling for corporate fixed effects and corporate-level time-varying characteristics, few country-level variables are consistently associated with corporate debt maturity. In two out of three estimations combining all countries, improvements in the institutional environment (as proxied by property rights) are positively associated with longer corporate debt maturity. In other words, borrowers can secure longer-term financing when expropriation risks are lower.

Global factors, such as measures of risk aversion and accommodative monetary conditions, are associated with changes in corporate debt maturity. In particular, corporate debt maturity is generally negatively associated with greater global risk aversion, while a rise in the US term spread is associated with a decline in debt maturity (see Appendix Table A.6).[10] However, these variables account for a small percentage of the variance of corporate debt maturity (Appendix Table A.7).

[9]The result that macroeconomic factors have limited ability in explaining debt maturity has been found also for US firms (Custódio, Ferreira, and Laureano 2013) and across countries (IMF 2015).

[10]Global risk aversion is measured by the average price of high-yield bonds, as given by the CSFB High Yield Index II (with higher prices indicating lower risk aversion). The results are robust to using the Chicago Board Options Exchange Volatility Index as a measure of risk aversion.

CHAPTER

5 Conclusions

With few exceptions little attention has been devoted to the topic of debt maturity in recent years, even though the use of short-term debt has been associated with a higher incidence of financial crises in the past. Moreover, recent studies have primarily focused on specifics types of debt (for example, firms in EMDEs as in IMF 2015 and Cortina-Lorente, Didier, and Schmukler 2017).

This paper fills the gap in the literature by analyzing recent developments in the behavior and determinants of debt maturity. We use multiple data sets to get at these issues across different income groups, focusing particularly on the maturity of sovereign and corporate debt.

Across income groups we do not find consistent differences in debt maturity; rather, patterns depend on the instruments or market segments considered. In particular, we find that:

- The median maturity of government bond issuances is similar across EMDEs and AEs when focusing on long-term bonds, but the median share of short-term debt issued in local markets is higher for the latter group of countries.
- The overall median maturity of corporate debt issuances is lower in EMDEs, but EMDEs can obtain longer maturities by issuing foreign currency debt in international markets.
- Even though the share of short-term syndicated loans is slightly higher among EMDEs than AEs, the average weighted maturity is higher too. This is explained by the higher share of syndicated loans used by EMDEs for project finance.

- Corporate balance sheet data, including firms of all sizes and not only those that are able to issue bonds or borrow in syndicated markets, show that the use of short-term debt is more prevalent among EMDEs.

In terms of the behavior of debt maturity over time, we find that:

- Debt maturity declined for firms (considering both bonds and loans) and governments in AEs and EMDEs during crises, particularly the Asian crisis and the GFC.
- The increase in corporate bond maturity in EMDEs after the GFC happened in combination with a potential increase in currency risk, since most of the lengthening in maturity has been driven by foreign currency issuances in international markets (even while local issuances have been rising over time). This poses a vulnerability for EMDEs that might not be able to accumulate foreign assets to hedge the increase in foreign liabilities.

Regarding the drivers of debt maturity, our main findings are:

- There are significant differences in the role that country factors play as determinants of sovereign debt maturity for EMDEs relative to AEs. Namely, negative domestic shocks and weaker balance sheets are more strongly negatively associated with shorter sovereign debt maturity in the case of EMDEs compared with AEs.
- Corporate debt (both bonds and loans) maturity is largely driven by corporate characteristics. In particular, firms with higher profitability (that is, lower risk of nonrepayment) and more tangible assets that can be pledged as collateral tend to borrow at longer maturities.
- Global factors, such as changes in risk aversion and the US term spread, influence debt maturities. Sovereign and corporate debt maturity lengthen as global risk aversion or the term spread drops. Yet these factors account for a relatively small percentage of the variance of debt maturity.

The findings from this study suggest several conclusions and policy implications:

- Because leverage and debt maturity drops during crises, firms and sovereigns that borrow long term should consider limiting their borrowing needs during such periods by building adequate buffers during good times. For sovereigns, this might mean holding higher reserve levels or other short-term assets. In the case of firms, building buffers would entail holding higher liquid asset ratios.
- Improving their risk profile is especially important for sovereigns in EMDEs, since they are generally more affected by negative domestic shocks

or a deterioration in their balance sheet. This underscores the importance of sound macroeconomic policies for this group of countries.

- Given that the recent lengthening in corporate bond maturity has gone hand in hand with an increase in foreign currency debt, authorities should monitor and potentially curtail foreign exchange exposures via targeted macro- and microprudential policies. For example, higher risk weights and limits on the share of foreign currency exposures on banks' or other regulated lenders' balance sheets might be considered. Also, regulators could use stress tests to assess creditors' exposure to foreign currency risk and incentivize reductions. Tax incentives that encourage foreign currency debt should also be removed.
- The institutional environment matters for debt maturity. In particular, governments seeking to borrow long-term are well-advised to implement policies that protect property rights since an improvement in property rights is associated in an extension of debt maturity.
- Because firms' and sovereigns' debt maturities are sensitive to global factors, policymakers should prepare for a potential near-term decline in debt maturity as monetary conditions normalize and perhaps risk aversion increases.
- There are significant data gaps that, if addressed, would allow policymakers to do a better job at monitoring developments in debt maturity. Financial accounts/flow of funds data commonly available for some AEs should be routinely collected across countries for the economy as a whole and by sector. Going more granular, information on nonsyndicated bank lending by maturity buckets would be extremely helpful to complement the information on debt maturity from corporate debt issuances and syndicated loan deals. Moreover, bank balance sheet data with a maturity breakdown is not available across countries. In our analysis, we indirectly tried to infer some of this information by comparing the maturity of debt and syndicated loans issuances with data from firms' balance sheets, but this is not ideal since the breakdown of maturities is very coarse. Hence, more granular data on debt maturity (that is, beyond the one-year cutoff) would also be informative. Finally, in our analysis we neglected to analyze the maturity of household debt due to a lack of comprehensive and comparable information across countries. Therefore, collecting data on household debt maturity is important to obtain a more complete picture of the use of short-term debt in an economy.

Box 1. The Use of Financial Accounts Data to Monitor the Use of Short-term Debt

The global financial crisis (GFC) underscored the need to collect data to monitor financial vulnerabilities and imbalances at the sector level within and across countries. Financial accounts data (often also referred to as flow of funds data) can be very useful for this purpose. These data capture financial transactions and financial positions (assets and liabilities) of sectors in the economy and reflect the interrelations between them and with the rest of the world. Typically, the sectors considered are general government, nonfinancial corporations, financial corporations, households and nonprofits, and the rest of the world.

The financial accounts include both stocks (or outstanding amounts) and flows. The former refers to elements of the balance sheet of each sector. The latter reflects changes in the stocks due to transactions and to valuation effects or reclassifications. Table 1.1 shows the structure of the balance sheet (that is, outstanding amounts) information collected in the Organisation for Economic Co-operation and Development (OECD) Financial Accounts.

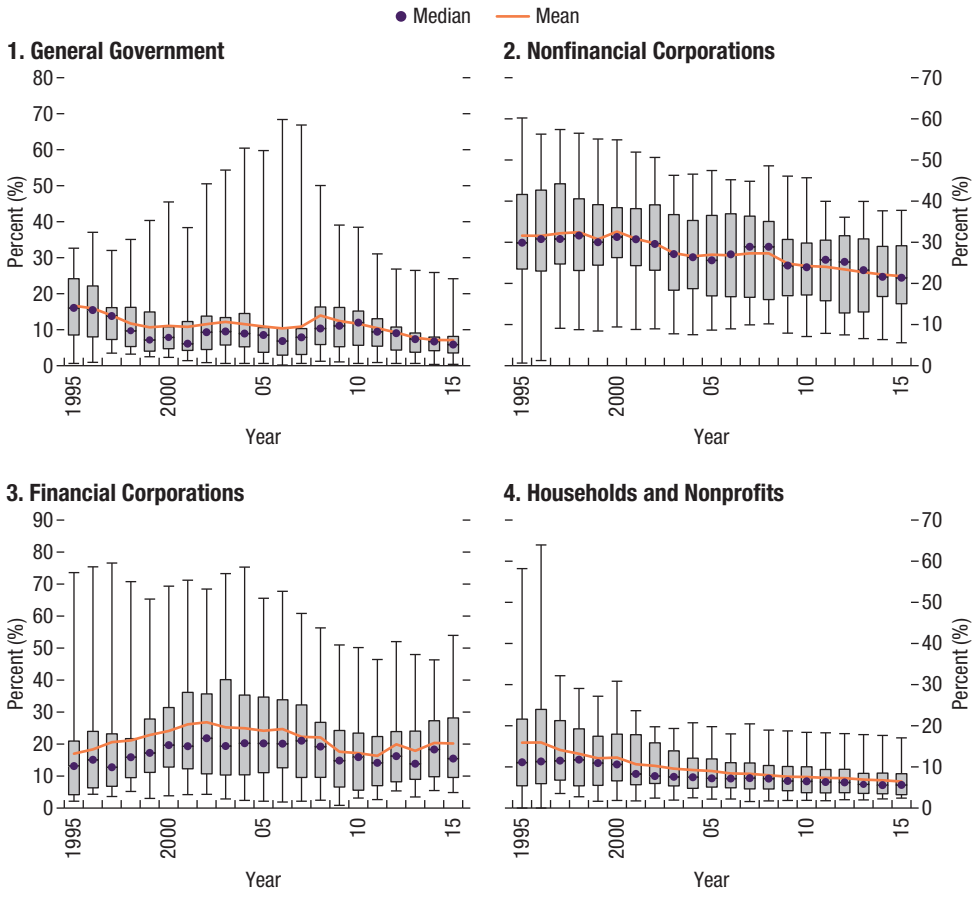
Table 1.1. Balance Sheet Structure in Organisation for Economic Co-operation and Development Financial Accounts

Account	General Government	Financial Corporations	Nonfinancial Corporations	Households and Nonprofits	Rest of the World
Assets					
Monetary Gold and SDRs					
Currency and Deposits					
Securities Other than Shares					
Short-term					
Long-term					
Loans					
Short-term					
Long-term					
Shares and Other Equity					
Insurance Technical Reserves					
Other Accounts Receivables					
Liabilities					
Currency and Deposits					
Securities Other than Shares					
Short-term					
Long-term					
Loans					
Short-term					
Long-term					
Shares and Other Equity					
Insurance Technical Reserves					
Other Accounts Payable					

Source: Organisation for Economic Co-operation and Development, https://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE610.
Note: SDRs = special drawing rights.

Box 1. The Use of Financial Accounts Data to Monitor the Use of Short-term Debt *(continued)*

Figure 1.1. The Share of Short-term Debt in Advanced Organisation for Economic Co-operation and Development Countries



Source: Organisation for Economic Co-operation and Development.

The balance sheet structure presented in Table 1.1 makes it possible to track the use of short-term debt in the economy by sector by constructing the share of short-term loans plus short-term securities to total loans and securities in the liabilities side of the balance sheet. Figure 1.1 shows this share for a subset of advanced OECD countries for which data is consistently available for the period 1995 to 2015.

Figure 1.1 shows that among advanced OECD countries, the use of short-term debt has generally trended downwards across sectors since the mid-1990s, except for financial corporations. For the general government, the median share of short-term debt declined in the late 1990s from 16 percent in 1995 to 7 percent in 1999. This share

Box 1. The Use of Financial Accounts Data to Monitor the Use of Short-term Debt *(continued)*

increased to 9 percent in 2002, following the Long-Term Capital Management (LTCM) crisis, and again more significantly during the GFC peaking at 12 percent in 2010. Among nonfinancial corporations, the use of short-term debt dropped from a median ratio of 30 percent in 1999 to a low of 26 percent in 2004. The ratio of short-term debt increased briefly to 29 percent in 2008 during the GFC only to decline to 21 percent in 2015. Among households and nonprofits, the use of short-term debt dropped consistently from 12 percent in the late 1990s to 6 percent in 2015. In contrast to other sectors, the use of short-term financing among financial corporations increased in the late 1990s and early 2000s, reaching 22 percent in 2002 after the LTCM crisis. The median share of short-term debt peaked again in 2007 at 21 percent and declined subsequently averaging close to 15 percent toward the end of the sample.

Appendix I. Data Sets

Our analysis of sovereign and corporate debt maturity is based on data on sovereign and corporate debt issuances, as well as on corporate syndicated loan deals for the period 1995 to 2014.[1] We also analyze corporate balance sheet data for the period 2005 to 2014. The sample covers 48 countries: 23 emerging market and developing economies (EMDEs) and 25 advanced economies (AEs) (see Table A.1).[2]

In the following, we describe each of the data sets on debt maturity followed by a description of other data used in the regression analysis of the determinants of debt maturity.

Sovereign Debt Issuances

Data on sovereign bond issuances comes from Dealogic DCM Analytics. Only issuances for which the issuer type is identified as "central government" are used. This allows us to focus on a more homogenous set of issuers with a clearer association between the issuers' characteristics and macro variables. Our full sample consists of 14,065 bond issuances, 72 percent of which come from AEs.

Maturity is defined as the number of years from the settlement date to the legal maturity date. The variable "Issuer Parent Nationality of Operation" is used to define the nationality of the issuer. We use the "Deal Currency Type" variable in the Dealogic data set to distinguish between local and foreign currency issuances, and we use the "International Market Y/N" variable in the

[1]The initial year, 1995, is based on the reliability and quality of Dealogic data.

[2]To distinguish between these two groups, we use the IMF's *World Economic Outlook* income classification (October 2016).

Dealogic data set to differentiate between issues in the local market and those in foreign markets.

Corporate Bond Issuances

The data on corporate bond issuances comes from Dealogic DCM Analytics. We include both financial and nonfinancial firms in the sample. Given our focus on corporate bond issuance, we exclude all government entities and public sector firms, following the practice in Gozzi et al. (2015) and Cortina-Lorente, Didier, and Schmukler (2016). Because bond maturity is our main variable of interest, we drop observations that have missing data on maturity.

We match the bond issuers in the Dealogic database with the corresponding corporate-level data from Thomson Reuters Worldscope, which contains annual balance sheet and income statement information for publicly listed firms. The matching is performed using information on the issuer company name, nationality of incorporation or operations, and industry classification. Manual inspection and adjustment are conducted to ensure matching accuracy.

The final matched Dealogic-Worldscope sample consists of 42,744 observations of bond issuances covering a total of 3,142 firms. About one-fifth of the firms come from EMDEs, of which three-quarters are nonfinancial firms. Among firms in AEs, more than 80 percent are nonfinancial corporations. We use this full sample to examine the evolution of the maturity structure of corporate bonds in our sample period.

For the regression analysis, we perform further data cleaning by winsorizing corporate characteristics at the 1 percent level and removing observations that report missing values in one or more of our control variables. We drop firms that had only one issuance throughout the whole sample period. The resulting sample consists of 21,061 observations of bond issuances from 1,953 firms in 43 countries.[3]

Corporate Syndicated Loans

The data on corporate syndicated loans[4] comes from Dealogic Loan Analytics. We include both financial and nonfinancial firms in the sample.

[3]Countries that drop off from the full sample include Croatia, Cyprus, Kazakhstan, Lebanon, Saudi Arabia, the United Arab Emirates, and Ukraine.

[4]We include both syndicated loans, which constitute 80 percent of the data set, and loans with a single lender (20 percent of the data set).

Our main variable of interest, loan maturity at issuance, is available at the tranche level.[5] Following Sufi (2007),[6] our analysis is based on data at the deal level, which we construct by following two steps. First, we obtain the weighted average maturity of the loan, weighting by the dollar amount of the tranche. Second, we collapse the data at the deal level. We exclude deals with status "Cancelled," "Withdrawn," or "Close," as well as those with negative or missing maturity.

Dealogic Loan Analytics does not provide a currency type variable. Therefore, we create a categorical variable for domestic/foreign currency syndicated loans by mapping the currency of the loan to the currency of the country where the deal is originated. Furthermore, we use information on lender nationality and borrower corporate nationality to classify loans as being provided by domestic, foreign, or mixed lenders as follows. Lenders are classified as domestic (foreign) when all banks participating in the deal have the same (different) nationality as the borrowing firm. Lenders are considered mixed when a combination of foreign and domestic banks participate in the deal.

Like we do with the corporate bond issuances, we perform a match[7] by borrowing company name and country location between borrowing firms in the Dealogic Loan Analytics sample and corporate-level data in Thomson Reuters Worldscope. Our matched sample consists of 27,678 loan issuances from 8,243 unique firms. We use this full sample to examine the trends in the maturity structure of corporate syndicated loans in our sample period.

For the regression analysis on the determinants of corporate syndicated loan maturity, due to restrictions in corporate balance sheet data availability, we work with a sample of 15,300 loan deals from 4,866 unique firms operating in 43 countries.[8] We winsorize corporate characteristics at the 1 percent level and drop firms that had only one issuance throughout the whole sample period.

[5]A syndicated loan may have more than one tranche. Therefore, some variables are recorded at the tranche level and others at the deal level.

[6]As discussed in Sufi (2007), it is appropriate to work with syndicated loan data at the deal level because the contract is drafted at the deal level for all participants collectively (not independently). Consequently, it is inappropriate to work at the tranche level as that would treat tranches within the same deal as independent observations.

[7]Notably, there are no common identifiers between Dealogic and Worldscope. In performing this match, we only consider those companies that return a perfect match by name and location.

[8]Countries that drop off from the full sample include Croatia, Cyprus, Kazakhstan, Lebanon, and Ukraine.

Corporate Balance Sheet Data

Because firms may receive financing other than from bond issuances or syndicated loan deals (for example, nonsyndicated bank loans and other financing), we use corporate-level balance sheet data to analyze the share of short-term debt held by firms. This balance sheet data comes from Orbis, a data set compiled by Bureau van Dijk from various national sources. Because the coverage of the data is limited before 2005, we focus on the period 2005 to 2014.

We keep one observation at the corporate-year-consolidation level and drop duplicates. To avoid double counting, we drop consolidated accounts and keep only unconsolidated accounts that do not integrate the statements of a firm's controlled subsidiaries.[9] We drop firms that do not have a NACE Rev. 2 code. We drop public firms and firms in the utility and financial sector because these firms likely face different regulations.[10] If the account closing date is after or on June 1, the current year is assigned. Otherwise the previous year is assigned.

Our set of corporate-level controls includes asset tangibility (measured by the ratio of fixed assets to total assets), profitability (measured by return over assets), growth opportunities (measured by the growth of sales to assets ratio), size (measured by the natural logarithm of total assets), and leverage (measured by the ratio of total debt to total assets). All ratios are expressed in percentages.

We drop firms with missing or nonpositive values in total assets, short-term debt, or long-term debt. We drop firms with short-term debt or long-term debt greater than total assets. We drop firms with zero total debt. We drop firms if total shareholders' funds and liabilities does not equal total assets. We express the financial variables in real US dollars 2005 base using the World Bank GDP deflator data. As a last step, we winsorize the distribution of each corporate-level variable by trimming the top and bottom 1 percent within the corresponding year. The data cleaning results in 7,328,800 firms in our sample (5,547,232 in AEs and 1,781,568 firms in EMDEs).

Our sample predominantly consists of privately held firms and small- and medium-sized enterprises (SMEs).[11] For AEs, about 0.2 percent of the firms (11,284) are publicly listed on a stock exchange and the rest are privately owned; about 98.5 percent of the firms (3,443,272) are SMEs. For EMDEs,

[9]We keep unconsolidated accounts with consolidation code 20, 21, 40, or 41.

[10]We drop firms with NACE two-digit codes 35, 36, 37, 38, 39 (utilities); 64, 65, 66 (financial sector); 84, 85 (public sector); or 97, 98, 99 (other services).

[11]We use the European definition of SMEs defined as firms with less than 250 employees.

about 0.7 percent of the firms (13,056) are publicly listed on a stock exchange and the rest are privately owned; about 82.7 percent of the firms (458,576) are SMEs. Our sample composition implies that our results are predominantly driven by small and unlisted firms, in contrast to the existing literature that has primarily focused on publicly listed firms.

The country coverage in Orbis is highly unbalanced. In our cleaned sample for AEs, the top three countries (France, Italy, Spain) account for 56.4 percent of the sample and the top five (adding Belgium and Germany) account for 72.9 percent. For EMDEs, the top two countries (Russia and China) account for 75.3 percent of the sample and the top five (adding Croatia, Ukraine, and Poland) account for 89.9 percent. The difference in country coverage in our sample mostly reflects the existence and coverage of a national corporate registry, but not necessarily the importance of a country's corporate sector relative to other countries. This is especially the case for EMDEs. For this reason, we use sampling weights in all our regression analysis, where we weight observations by the inverse of the number of a country's observations as a share of the total number of observations.[12] We further restrict our analysis to countries that had a minimum of 25 firms over the period 2005 to 2014.

We measure the use of short-term debt with the share of short-term to total debt, where the numerator includes the sum of short-term financial debt (payable within a year) and the part of long-term financial debt due within a year. The short-term-debt-to-total-debt ratio thus captures the maturity composition of debt. We also examine the ratio of short-term debt to total assets.

Other Data

In the regression analysis of the determinants of debt maturity, a common group of control variables is used to account for country characteristics and global factors.

The growth rate of real GDP per capita and consumer price index inflation are obtained from the January 2017 IMF *World Economic Outlook*. Data on property rights come from the Heritage Foundation property rights index.[13] Domestic credit to private sector (in percent of GDP) is obtained from the World Bank's World Development Indicators. We use general government debt data from the IMF Historical Public Debt Database; reserves data comes from the IMF International Financial Statistics. Macro variables are measured on an annual basis.

[12]Without sampling weights, our results would be driven by a few countries.
[13]http://www.heritage.org/index/property-rights

For the global factors, since data are available daily, we use either data for the issuance date or the last day before the issuance date for which data is available. We obtain data for the average price of high-yield bonds (CSFB High Yield Index II; expressed as a percent of par value) from Bloomberg. These data are available daily since 2010, weekly from July 11, 1996, and monthly before that. The US term spread is computed as the difference between the yields of US 10-year and 3-month government bonds. We obtain the data from DataStream.

All variable definitions and sources are in Table A.2.

Appendix II. Empirical Estimations

The Maturity of Sovereign Issuance

To analyze the determinants of the maturity of sovereign issuances, we estimate the following equation:

$$\text{Sovereign maturity}_{i,t} = \beta_1 \text{Issuance characteristics}_{i,t} + \beta_2 \text{Country characteristics}_{i,t} + \beta_3 \text{Global factors}_t + \alpha_i + \upsilon_{i,t}$$

where *Sovereign maturity* is the original maturity of the debt issued by the central government in country *i* at time *t*. *Issuance characteristics* include dummies for the currency of denomination and the market of issuance.[1] *Country characteristics* include GDP growth, debt-to-GDP ratio, reserves-to-debt ratio, inflation, a property rights index, and the share of private credit to GDP. *Global factors* refer to high-yield bond prices and US term spreads. Country fixed effects are included and represented by α_i. Variable definitions and sources can be found in Table A.2. The results of these estimations are reported in Tables A.3 to A.5.

The Maturity of Corporate Debt Issuances

To analyze the determinants of the maturity of corporate bond issuances, we estimate the following equation:

[1]We control for the currency of issuance by including a dummy equal to one if the issuance was denominated in the local currency and zero for those issuances denominated in a foreign currency. We control for the market of issuance by including a dummy that takes the value of one if the issuance happened in the local market and zero otherwise.

$$\text{Corporate bond maturity}_{j,i,t} = \beta_1 \text{Issuance characteristics}_{j,i,t} + \beta_2 \text{Firm characteristics}_{j,i,t} + \beta_3 \text{Country characteristics}_{i,t} + \beta_4 \text{Global factors}_{t} + \delta_j + \upsilon_{j,i,t}$$

where *Corporate bond maturity* is the original maturity of the debt issued by firm *j* in country *i* at time *t*. *Issuance characteristics* include dummies for the currency of denomination and the market of issuance.[2] Firm characteristics include the log of firm assets, the debt to assets ratio, return on assets (ROA), the growth of sales to assets and the ratio of fixed to total assets. *Country characteristics* and *Global factors* are defined as aforementioned. Corporate-level fixed effects are included and represented by δ_j. Variable definitions and sources can be found in Table A.2. The results of these estimations are reported in Tables A.6 to A.8.

The Maturity of Syndicated Loan Deals

To analyze the determinants of the maturity of syndicated loan deals, we estimate the following equation:

$$\text{Corporate loan maturity}_{j,i,t} = \beta_1 \text{Loan deal characteristics}_{j,i,t} + \beta_2 \text{Firm characteristics}_{j,i,t} + \beta_3 \text{Country characteristics}_{i,t} + \beta_4 \text{Global factors}_{t} + \delta_j + \upsilon_{j,i,t}$$

where *Corporate loan maturity* is the original maturity of syndicated loans issued by firm *j* in country *i* at time *t*. *Loan deal characteristics* include the number of participants, the number of tranches, dummies to capture the purpose of the loan (acquisition, capital expenditures, general corporate services, project finance, recapitalization, refinancing, trade finance), a dummy for domestic currency loans, and dummies for the type of lender (foreign, domestic, or mixed). *Firm characteristics*, *Country characteristics*, and *Global factors* are defined as aforementioned. Corporate-level fixed effects are included and represented by δ_j. Variable definitions and sources can be found in Table A.2. The results of these estimations are reported in Tables A.6 to A.8.

[2]We control for the currency of issuance by including a dummy equal to one if the issuance was denominated in the local currency and zero for those issuances denominated in a foreign currency. We control for the market of issuance by including a dummy that takes the value of one if the issuance happened in the local market and zero otherwise.

The Share of Corporate Short-term Debt

To analyze the determinants of the corporate short-term debt ratio, we estimate the following equation:

$$\text{Corporate short-term debt ratio}_{j,i,t} = \beta_1 \text{Firm characteristics}_{j,i,t} + \beta_2 \text{Country characteristics}_{i,t} + \beta_3 \text{Global factors}_{t} + \delta_j + \upsilon_{j,i,t}$$

where *Corporate short-term debt ratio* is the ratio of short-term (with maturity less than a year) to total debt. *Firm characteristics*, *Country characteristics*, and *Global factors* are defined as aforementioned. Corporate-level fixed effects are included and represented by δ_j. Variable definitions and sources can be found in Table A.2. The results of these estimations are reported in Tables A.6 to A.8.

Table A.1. Data Coverage

Database	Dealogic			Orbis
Country	Number of sovereign debt issuances	Number of corporate syndicated loan deals	Number of corporate bond issuances	Number of firms
Argentina[1]	137	56	136	192
Australia[2]	602	598	391	7,013
Austria	451	22	290	11,785
Bahrain	13	16	7	14
Belgium[2]	470	46	55	377,992
Brazila	110	233	423	5,751
Canada[2]	162	1,593	854	2,656
Chile[1]	15	100	272	357
China[1]	611	792	678	272,878
Colombia[1]	80	35	126	40,993
Croatia	56	10	5	88,205
Cyprus	10	5	15	1,302
Czech Republic	351	16	52	124,033
Denmark	279	63	30	66
Finland	224	117	179	96,671
France[2]	1,198	341	1,476	1,275,426
Germany[2]	465	407	4,333	536,587
Greece	253	101	36	34,083
Hong Kong SAR	73	480	180	445
India[1]	220	702	1,456	29,782
Ireland[2]	125	71	259	40,243
Israel	168	29	8	1,527
Italy[2]	1,424	199	1,347	989,619
Kazakhstan	81	15	21	866
Korea	13	596	4764	240,305
Lebanon	99	4	2	4
Luxembourg	7	80	317	7,010
Malaysia[1]	99	10	107	2,955
Mexico[1]	119	65	357	5,818
New Zealand	22	112	119	985
Pakistan	12	39	4	418
Peru	24	48	155	1,159
Philippines[1]	270	95	159	12,992
Poland[1]	658	40	12	63,019
Portugal	271	14	343	296,034
Russia[1]	572	40	147	1,068,175
Saudi Arabia	2	7	2	117
Singapore	80	139	289	2,732
Slovak Republic	345	11	35	71,495
South Africa	27	79	13	1,720
Spain[2]	786	193	153	864,326
Sweden[2]	792	210	779	189,202
Thailand[1]	79	32	118	44,271
Turkey[1]	395	229	80	32,473
Ukraine	296	10	14	109,356
United Arab Emirates	12	35	18	53
United Kingdom[2]	653	1,195	1,721	368,594
United States[2]	854	18,348	20,407	7,101
Total	**14,065**	**27,678**	**42,744**	**7,328,800**

Source: Dealogic.

[1]Countries for which we have data on the share ratio of short-term (original maturity) domestically issued debt over total domestic debt from a 2014 updated version of the database by Jeanne and Guscina (2006).

[2]Countries for which we have data on the share of local currency short-term (original maturity) debt over total debt from Abbas et al. (2014).

Table A.2. Variable Definitions and Sources

Variable name	Definition	Source
Issuance characteristics		
Local currency dummy	Dummy equal to one if debt issuance (or loan deal depending on the estimations) is denominated in local currency.	Dealogic DCM for sovereign and corporate issuances Dealogic Loan Analytics for syndicated loan deals
Local market dummy	Dummy equal to one if debt issuance is conducted in the local market	Dealogic DCM for sovereign and corporate issuances
Loan deal characteristics		
Number of participants	Number of participants in a syndicated loan deal	Dealogic Loan Analytics
Number of tranches	Number of tranches in a syndicated loan deal	Dealogic Loan Analytics
Purpose of the loan dummies	Reported use of loan proceeds. Dummies capture the following categories: acquisitions, capital expenditures, general corporate purposes and working capital, project finance, recapitalization, refinancing and trade finance. The omitted category is "other".	Dealogic Loan Analytics
Domestic currency dummy	Dummy equal to one if loan is in domestic currency	Dealogic Loan Analytics
Dummies for type of lender	Dummies for foreign and mixed (combination of domestic and foreign) lenders. Domestic lender is the omitted category.	Dealogic Loan Analytics
Firm characteristics		
Ln(Assets)	Log of assets	Worldscope for corporate issuance estimations Orbis for corporate-level estimations of the share of short-term to total debt
Debt-to-assets	Debt to assets ratio	Worldscope for corporate issuance estimations Orbis for corporate-level estimations of the share of short-term to total debt
ROA	Return on assets	Worldscope for corporate issuance estimations Orbis for corporate-level estimations of the share of short-term to total debt
Growth of sales to assets	Percentage change in the ratio of sales to assets	Worldscope for corporate issuance estimations Orbis for corporate-level estimations of the share of short-term to total debt
Fixed assets to total assets	Ratio of fixed assets to total assets	Worldscope for corporate issuance estimations Orbis for corporate-level estimations of the share of short-term to total debt
Country characteristics		
Growth GDP per capita	Percentage change in GDP per capita in constant dollars	World Economic Outlook (IMF)
Debt/GDP ratio	Ratio of total government debt to GDP	Historical Public Debt Database (IMF)
Reserves/Government Debt	Ratio of international reserves to total government debt	World Economic Outlook (IMF) and Historical Public Debt Database (IMF)
Inflation	Percentage change in the GDP deflator	World Economic Outlook (IMF)
Property Rights Index	Index measures the degree to which a country's laws protect private property rights and the government enforces those laws. It also captures the likelihood that private property will be expropriated and assesses the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. The greater the legal protection of property the higher the score of the index.	Heritage Foundation
Private credit to GDP	Ratio of credit to the private sector to GDP	Bank for International Settlements
Global factors		
CSFB index	Credit Suisse First Boston High Yield Index. Average price expressed as percent of par value.	Bloomberg
US Term Spread	Difference between US long-term interest rate and US 3-month treasury bill	OECD Statistics and Datastream

Source: IMF staff.

Table A.3. The Maturity of Sovereign Bond Issuances—All Countries

	Dependent variable: Bond maturities in years												
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Currency and market													
Local Currency Dummy	1.168											4.025**	4.045**
	(1.01)											(1.46)	(1.45)
Local Market Dummy		−1.357										−3.803***	−3.807***
		(1.00)										(1.23)	(1.24)
Country-level variables													
Growth GDP per capita			0.117***									0.172***	0.107***
			(0.03)									(0.03)	(0.03)
Debt/GDP ratio				0.001								0.004	0.006
				(0.02)								(0.02)	(0.02)
Reserves/Government Debt					0.0004***							0.001**	0.00
					(0.00)							(0.00)	(0.00)
Inflation						−0.043						−0.024	−0.031
						(0.03)						(0.02)	(0.02)
Property Rights Index							0.036					0.042	0.072
							(0.05)					(0.05)	(0.04)
Private Credit to GDP								0.004				0.004	0.004
								(0.01)				(0.01)	(0.01)
Global factors													
CSFB index									0.034***		0.029**		0.015
									(0.01)		(0.01)		(0.01)
US Term Spread										−0.352**	−0.300**		−0.390***
										(0.15)	(0.13)		(0.12)
Observations	13,633	13,633	13,633	13,633	13,633	13,633	13,633	13,633	13,633	13,633	13,633	13,633	13,633
R-squared	0.129	0.13	0.129	0.128	0.128	0.128	0.128	0.128	0.13	0.13	0.131	0.143	0.146

Source: IMF staff calculations.

Note: Estimations follow those in Appendix II for sovereign bond issuances. Country fixed effects are included. Standard errors are clustered at the country and year level are in parentheses. CSFB = Credit Suisse First Boston. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.4. The Maturity of Sovereign Bond Issuances—Advanced Economies

	Dependent variable: Bond maturities in years												
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Currency and market													
Local currency dummy	3.610***											7.327***	7.342***
	(0.69)											(1.60)	(1.60)
Local market dummy		−0.795										−4.573***	−4.569***
		(1.30)										(1.45)	(1.46)
Country-level variables													
Growth GDP per capita			0.070*									0.133***	0.063
			(0.04)									(0.04)	(0.05)
Debt/GDP ratio				0.005								0.007	0.009
				(0.02)								(0.02)	(0.02)
Reserves/Government Debt					0.0004***							0.001***	0.001**
					(0.00)							(0.00)	(0.00)
Inflation						−0.122						−0.057	−0.070
						(0.10)						(0.10)	(0.09)
Property Rights Index							0.029					0.019	0.043
							(0.06)					(0.05)	(0.05)
Private credit to GDP								0.003				−0.004	−0.004
								(0.01)				(0.01)	(0.01)
Global factors													
CSFB index									0.028*		0.024*		0.012
									(0.01)		(0.01)		(0.01)
US Term Spread										−0.283*	−0.245*		−0.352**
										(0.14)	(0.12)		(0.16)
Observations	9,717	9,717	9,717	9,717	9,717	9,717	9,717	9,717	9,717	9,717	9,717	9,717	9,717
R-squared	0.136	0.125	0.125	0.124	0.124	0.125	0.124	0.124	0.126	0.126	0.127	0.154	0.157

Source: IMF staff calculations.

Note: Estimations follow those in Appendix II for sovereign bond issuances. Country fixed effects are included. Standard errors are clustered at the country and year level are in parentheses. CSFB = Credit Suisse First Boston. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.5. The Maturity of Sovereign Bond Issuances—Emerging Market and Developing Economies

	Dependent variable: Bond maturities in years												
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Currency and market													
Local currency dummy	−3.016***											−2.732*	−2.711*
	(0.74)											(1.34)	(1.34)
Local market dummy		−2.644***										−1.349	−1.347
		(0.72)										(1.18)	(1.19)
Country-level variables													
Growth GDP per capita			0.187***									0.216***	0.145**
			(0.04)									(0.06)	(0.06)
Debt/GDP ratio				−0.030								−0.011	−0.006
				(0.02)								(0.02)	(0.03)
Reserves/Government Debt					0.670*							0.666	0.622**
					(0.35)							(0.39)	(0.23)
Inflation						−0.038						−0.061***	−0.070**
						(0.03)						(0.02)	(0.03)
Property Rights Index							0.058					0.035	0.073
							(0.09)					(0.09)	(0.09)
Private credit to GDP								0.009				0.020	0.013
								(0.01)				(0.02)	(0.02)
Global factors													
CSFB index									0.053***		0.042**		0.028
									(0.02)		(0.02)		(0.03)
US Term Spread										−0.537*	−0.441		−0.446
										(0.31)	(0.31)		(0.26)
Observations	3,916	3,916	3,916	3,916	3,916	3,916	3,916	3,916	3,916	3,916	3,916	3,916	3,916
R-squared	0.124	0.122	0.114	0.11	0.11	0.11	0.109	0.109	0.114	0.114	0.117	0.143	0.148

Source: IMF staff calculations.

Note: Estimations follow those in Appendix II for sovereign bond issuances. Country fixed effects are included. Standard errors are clustered at the country and year level are in parentheses. CSFB = Credit Suisse First Boston. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.6. The Maturity of Corporate Debt—All Countries

Variables	Syndicated loan maturity at issuance (in years)	Bond maturity at issuance, (in years)	Short-term debt to total debt (%)
Corporate characteristics			
Ln(Assets)	0.004	0.325	−2.079***
	(0.02)	(0.24)	(0.63)
Debt-to-Assets	−0.001	−0.002	−0.177***
	(0.00)	(0.01)	(0.05)
ROA	0.009***	0.046**	−0.0866***
	(0.00)	(0.02)	(0.03)
Growth of sales to assets	−0.001	0.067	−0.0003
	(0.00)	(0.27)	(0.00)
Fixed Assets-to-Assets	−0.004	0.032*	−0.194***
	(0.00)	(0.02)	(0.03)
Country characteristics			
Growth GDP per capita	0.002	1.786***	−0.252
	(0.02)	(0.17)	(0.15)
Inflation	0.092**	−0.141	0.049
	(0.04)	(0.09)	(0.14)
Property rights index	0.059**	0.144***	−0.229
	(0.02)	(0.04)	(0.31)
Private Credit to GDP	0.002	0.015	−0.028
	(0.00)	(0.02)	(0.04)
Debt/GDP ratio	0.016***	−0.003	−0.080
	(0.00)	(0.01)	(0.05)
Reserves/Government Debt	0.000	3.041*	0.007
	(0.00)	(1.61)	(0.02)
Global factors			
CSFB index	0.026***	0.062***	1.400
	(0.01)	(0.02)	(0.79)
US Term Spread	−0.132***	−0.070	0.185
	(0.03)	(0.05)	(0.11)
Observations	13,325	21,061	12,160,285
R-squared	0.603	0.370	0.776
Firm FE	Yes	Yes	Yes
Cluster Country and Year	Yes	Yes	Yes
Additional controls	Deal characteristics	Bond characteristics	None
Number of countries	42	43	43

Source: IMF staff calculations.

Note: Estimations follow those in Appendix II for corporate bond and loan issuances and for the share of short-term debt. Firm fixed effects are included. Standard errors are clustered at the country and year level are in parentheses. CSFB = Credit Suisse First Boston; ROA = return on assets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.7. Variance Decomposition—Corporate Maturity—All Countries

	Syndicated loan maturity at issuance	Bond maturity at issuance	Share of short-term debt
Loan/bond characteristics	19.9	0.6	n.a.
Corporate characteristics	66.6	88.9	85
Country characteristics	7.8	9.4	15
Global factors	5.7	1.1	0

Source: IMF staff calculations.

Table A.8. The Maturity of Corporate Debt—Advanced Economies

Variables	Syndicated loan maturity at issuance (in years)	Bond maturity at issuance (in years)	Short-term debt to total debt (%)
Corporate characteristics			
Ln(Assets)	−0.006	0.586**	−1.943*
	(0.03)	(0.21)	(1.02)
Debt-to-Assets	0.001	−0.001	−0.191**
	(0.00)	(0.01)	(0.06)
ROA	0.009***	0.050**	−0.0902***
	(0.00)	(0.02)	(0.03)
Growth of sales to assets	0.000	0.129	−0.002
	(0.00)	(0.29)	(0.00)
Fixed Assets-to-Assets	−0.003	0.043***	−0.152***
	(0.00)	(0.01)	(0.04)
Country characteristics			
Growth GDP per capita	−0.008	1.125	−0.056
	(0.02)	(0.97)	(0.15)
Inflation	0.115***	−0.166	−0.141
	(0.03)	(0.20)	(0.17)
Property rights index	0.068***	0.140*	0.41
	(0.02)	(0.07)	(0.28)
Private Credit to GDP	0.001	0.016	0.028
	(0.00)	(0.02)	(0.03)
Debt/GDP ratio	0.016***	−0.009	−0.014
	(0.00)	(0.01)	(0.04)
Reserves/Government Debt	0.000	1.494	0.025
	(0.00)	(2.16)	(0.06)
Global factors			
CSFB index	0.029***	0.067***	0.70
	(0.01)	(0.02)	(0.49)
US Term Spread	−0.134***	−0.036	0.09
	(0.03)	(0.07)	(0.07)
Observations	12,070	18,654	11,432,464
R-squared	0.547	0.356	0.794
Firm FE	Yes	Yes	Yes
Cluster Country and Year	Yes	Yes	Yes
Additional controls	Deal characteristics	Bond characteristics	None
Number of countries	23	25	23

Source: IMF staff calculations.

Note: Estimations follow those in Appendix II for corporate bond and loan issuances and for the share of short-term debt. Firm fixed effects are included. Standard errors are clustered at the country and year level are in parentheses. CSFB = Credit Suisse First Boston; ROA = return on assets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.9. The Maturity of Corporate Debt—Emerging Market and Developing Economies

Variables	Syndicated loan maturity at issuance (in years)	Bond maturity at issuance (in years)	Short-term debt to total debt (%)
Corporate characteristics			
Ln(Assets)	0.602*	0.102	−1.954**
	(0.314)	(0.215)	(0.770)
Debt-to-Assets	−0.018	0.004	−0.163**
	(0.018)	(0.018)	(0.065)
ROA	0.032	0.016	−0.086
	(0.036)	(0.044)	(0.048)
Growth of sales to assets	−0.005	−0.112	0.001
	(0.005)	(0.497)	(0.005)
Fixed Assets-to-Assets	−0.005	−0.024	−0.240***
	(0.025)	(0.020)	(0.042)
Country characteristics			
Growth GDP per capita	0.006	3.084	−0.334
	(0.038)	(3.980)	(0.234)
Inflation	0.023	−0.124	0.110
	(0.063)	(0.111)	(0.160)
Property rights index	−0.022	0.096	−0.508
	(0.052)	(0.087)	(0.584)
Private Credit to GDP	−0.017	−0.025	−0.111
	(0.015)	(0.027)	(0.081)
Debt/GDP ratio	0.031	−0.001	−0.037
	(0.025)	(0.032)	(0.119)
Reserves/Government Debt	−0.004	2.923*	0.010
	(0.009)	(1.519)	(0.025)
Global factors			
CSFB index	−0.004	0.014	1.884
	(0.024)	(0.013)	(1.375)
US Term Spread	−0.014	−0.409	0.269
	(0.103)	(0.247)	(0.191)
Observations	1,255	2,407	727,821
R-squared	0.776	0.514	0.747
Firm FE	Yes	Yes	Yes
Cluster Country and Year	Yes	Yes	Yes
Additional controls	Deal characteristics	Bond characteristics	None
Number of countries	19	18	20

Source: IMF staff calculations.

Note: Estimations follow those in Appendix II for corporate bond and loan issuances and for the share of short-term debt. Firm fixed effects are included. Standard errors are clustered at the country and year level are in parentheses. CSFB = Credit Suisse First Boston; ROA = return on assets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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