

SPECIAL FOCUS 2

Corporate Debt:
Financial Stability and Investment Implications

Corporate Debt: Financial Stability and Investment Implications

Average corporate debt in emerging market and developing economies (EMDEs) has risen over the past decade. This trend raises concerns for their financial stability and growth prospects. Debt service costs of EMDE firms are expected to rise as advanced economies normalize monetary policy, and debt is increasingly held by firms with riskier balance sheets. Firm-level empirical analysis also suggests that debt overhang may be associated with weak investment, especially in large or highly leveraged firms. Countercyclical and macroprudential policies can address financial stability concerns. Structural policies, including the strengthening of bankruptcy regimes, are appropriate tools to address the investment implications of elevated corporate debt.

Introduction

By 2017, corporate debt in emerging market and developing economies (EMDEs) had reached levels that significantly exceeded its average prior to the global financial crisis as well as its longer-term average (1995-2007; Figure SF2.1). EMDE corporate debt now also rivals the size of government debt. While the increase in corporate indebtedness among EMDEs partly reflects improved and deeper access to capital markets, it raises two concerns.

First, excessive corporate debt can threaten financial stability, leading to distress in the non-financial corporate sector and systematic balance sheet difficulties in the banking sector. Most directly, as policy interest rates rise and the cost of debt service increases, incidence of corporate distress tends to intensify. Firms may also become more vulnerable to balance sheet shocks, such as through currency mismatches associated with U.S. dollar appreciation.¹ Deterioration in nonfinancial corporate balance sheets may transmit to the banking sector as well. Previous episodes of rapid corporate debt buildup have at times coincided with episodes of financial stress, which can have adverse macroeconomic consequences.²

Note: This Special Focus was prepared by Eduardo Borensztein and Lei Sandy Ye. Research assistance was provided by Miyoko Asai, Julia Roseman, and Heqing Zhao.

¹Large unhedged exposure in foreign exchange combined with depreciation of currency may raise this vulnerability (Acharya et al. 2015).

²Debt overhangs were found to have impacted investment on European economies after the global financial crisis, and leverage was found to have an impact on U.S. firms during the crisis (Kalemli-Ozcan, Laeven, and Moreno 2015; Giroud and Mueller 2017). Also,

Second, elevated corporate debt may have implications for longer-term growth if it coincides with a period of subdued post-crisis private investment growth (World Bank 2017; Kose et al. 2017). Excessive corporate debt could dampen investment and the expansion of productive capacity necessary for healthy growth, as a disproportionate amount of corporate earnings would need to be paid to creditors rather than equity investors. This channel can adversely impact the growth prospects of EMDEs, and is the primary topic addressed in this Special Focus.

The Special Focus first discusses trends in EMDE corporate debt and associated financial stability risks. It subsequently assesses empirical linkages between corporate debt and investment activity based on firm-level data, with a focus on the “debt overhang” channel. The analysis focuses on nonfinancial corporations, as they are foremost in private capital investment activity and thus are most germane to the linkage between corporate debt and investment.

Four questions are addressed:

- How has corporate debt evolved in EMDEs?
- What are the financial stability risks associated with elevated corporate debt?
- Does a “debt overhang” dampen capital investment in the EMDE corporate sector?

the Republic of Korea’s Chaebol debt-driven expansion abruptly ended and required massive corporate restructuring during the Asian Financial Crisis. These issues were compounded by an insolvency system that was unable to effectively resolve corporate distress.

- What are the main policy implications associated with elevated corporate debt?

This Special Focus documents the rise in corporate debt over the past decade in EMDEs, and finds that an increasing share of debt is held by firms with higher financial risk (e.g., lower interest coverage ratios). Moreover, high corporate debt has been associated with weaker investment growth. At both the country and firm level, private investment growth has been correlated with corporate debt service capacity. Moreover, the adverse effect of debt overhangs on investment is more pronounced among large and highly leveraged firms. This investigation studies this medium-term channel that may impact investment for an extended period of time even absent the occurrence of a crisis.

This analysis contributes to the literature on corporate debt overhangs by analyzing the reaction of investment to debt overhang by large and small private firms for a diverse sample of large EMDEs. It subsequently explores cross-sectional dimensions, such as firm size, that may affect the sensitivity of investment to debt overhang across firms. The literature on this linkage has thus far focused on stock exchange listed firms, which may not fully reflect the state of the corporate sector in EMDEs.

The analysis points to both cyclical and structural policy priorities:

- From a cyclical perspective, the financial stability risks highlight the need for the build-up of fiscal buffers to prevent a corporate default surge from having systemic consequences. Prudential regulations that monitor liquidity and currency risks in large firms' debt would also be appropriate, especially since the boom in corporate debt has been concentrated among large (and likely systemically important) firms.
- From a structural policy perspective, in cases where debt overhangs are slowing private investment over an extended period, policy measures to curb debt bias—such as thin capitalization rules or equity market

promotion—are warranted. Policies to encourage equity financing and promote debt/equity balance are especially relevant for small firms. Similarly, policies to strengthen bankruptcy regimes may both improve investment activity by increasing investor confidence and by mitigating the macroeconomic costs of bankruptcies when they occur.

Corporate debt landscape in EMDEs

Corporate debt in EMDEs has, on average, risen from about 60 percent of GDP in 2006 to 86 percent of GDP in 2017 (Figure SF2.1). This increase has been especially pronounced in China, where corporate debt reached more than 160 percent of GDP by 2017. In other EMDEs, corporate debt has risen by more than 10 percentage points of GDP over 2006-2017.³

Trends in EMDE corporate debt are quite heterogeneous across countries, and their rise has been concentrated in larger EMDEs. In 2016-17, a number of large emerging economies—especially in Latin America and the Caribbean (LAC) and Europe and Central Asia (ECA)—experienced lower credit growth, partly due to higher credit risks associated with higher debt built-up in earlier years.

A number of other features characterize recent developments in corporate debt among EMDEs:

- **EMDEs versus advanced economies.** By 2017, China's corporate debt-to-GDP ratio far exceeded the average of advanced economies. For other EMDEs, corporate debt levels are still substantially below that of advanced economies.⁴

³ In China, the decline in the corporate debt-to-GDP ratio over the past two years was primarily driven by slowing credit growth. In other EMDEs, while credit growth slowed as well, faster nominal GDP growth in 2017 also contributed to the decline in corporate debt-to-GDP ratios.

⁴ The benchmark sample of 16 EMDEs with Bank for International Settlements (BIS) data consists of mostly large EMDEs that comprise four-fifth of EMDE GDP.

- Regional dimensions.** The increase in corporate debt ratios over the past decade was most pronounced in East Asia and Pacific (EAP) and ECA.⁵ Corporate debt ratios also rose in most other regions of the world over the past decade, and tend to range between 30 to 40 percent of GDP.
- Corporate versus other sectors.** Corporate debt is, on average, substantially higher than household and financial sector debt in EMDEs. By 2017, corporate debt is now comparable in magnitude to sovereign debt (Figure SF2.2).
- Domestic versus foreign currency.** The rise in corporate debt has been supported by both borrowing in local and foreign currency.⁶ Outside of China, the contribution of foreign currency debt has been substantial, constituting nearly half of the growth in corporate debt over 2010-2017.
- External versus domestic sources.** More than one-tenth of outstanding corporate debt in EMDEs is financed by cross-border sources.⁷ Outside of China, about one-third of corporate debt is financed by cross-border sources, consistent with the trends for currency composition of corporate debt.
- Bond versus bank debt.** Bond debt remains a modest but increasing fraction of total corporate debt, as corporates have shifted from bank loans to bond issuances over the past decade (Ohnsorge and Yu 2017; Feyen et al. 2015; Ayala, Nedeljkovic, and Saborowski 2017; World Bank 2016). As of 2017, debt securities are estimated to be about one-fifth of EMDE corporate debt. Bond issuances in

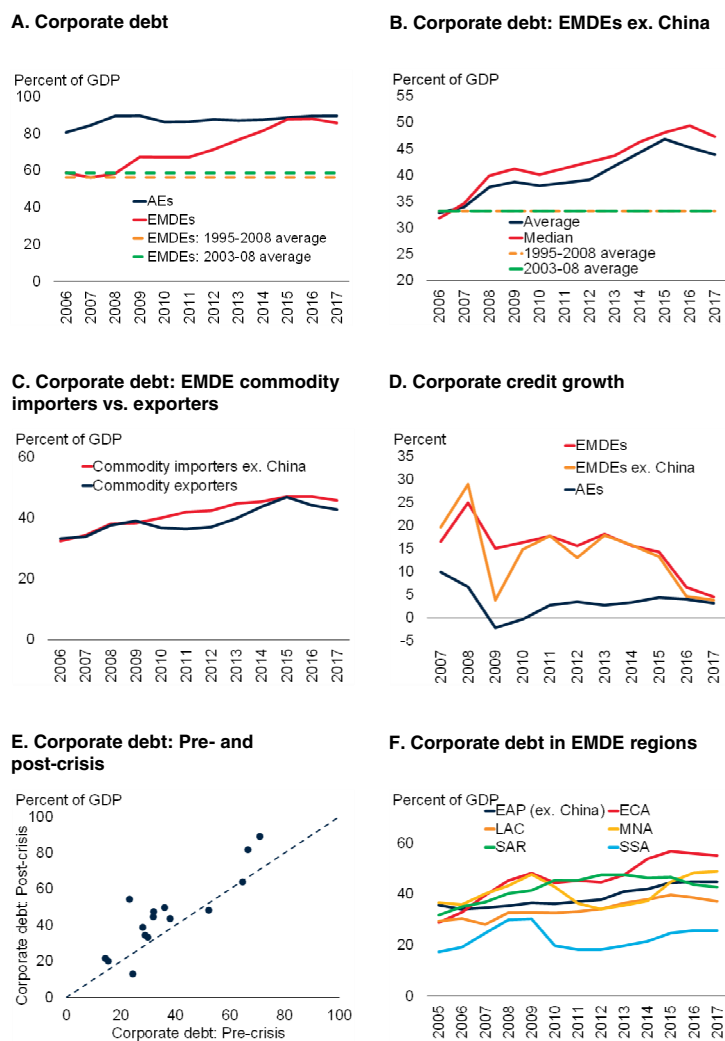
⁵In the Sub-Saharan Africa (SSA) region, growing public debt burdens of low-income countries are of particular concern. Please see Chapter 2 for more details.

⁶The increase in foreign currency debt is not driven by nominal exchange rate valuation. Over the period 2006-2017, the average real effective exchange rate in the sample EMDE economies depreciated by about 5 percent.

⁷Based on data from the BIS, external sources of corporate funding can be proxied by the sum of the stock of outstanding cross-border bank claims and amount of outstanding international debt securities in each country. The residual would be domestic funding.

FIGURE SF2.1 Corporate debt in EMDEs: General trends

Corporate debt in EMDEs has risen over the past decade and is now substantially above long-term averages. The increase in corporate debt has occurred in both commodity exporters and importers. Credit growth has slowed in recent years, especially in a few large commodity exporters. The increase in corporate debt has been especially pronounced among several large EMDEs across regions.



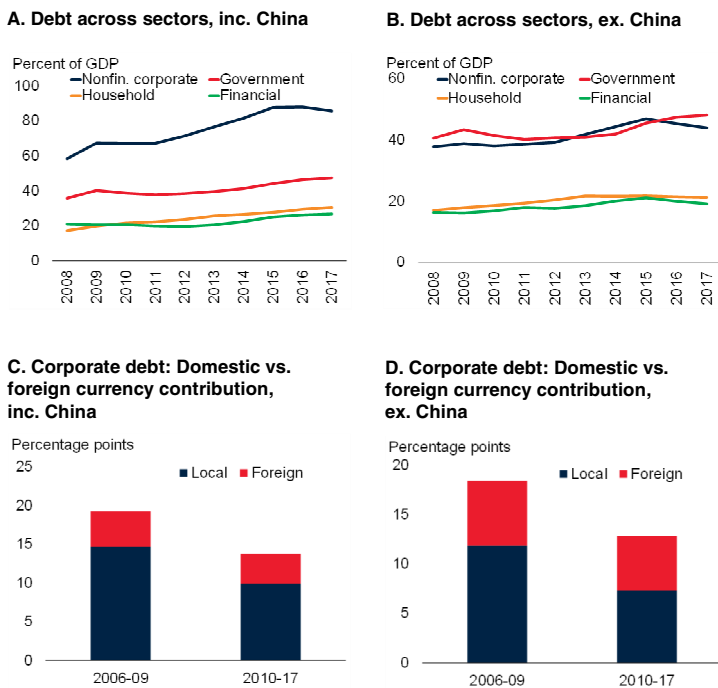
Sources: Bank for International Settlements, Institute for International Finance (IIF).
 A-D. Figures show GDP-weighted averages for 16 EMDEs (seven commodity importers and nine commodity exporters) and 27 advanced economies (AEs).
 E. Average annual corporate debt-to-GDP ratio. Each blue dot denotes an economy. Excludes outliers. Pre-crisis and post-crisis denote 2003-07 and 2010-17, respectively. Dotted line denotes 45 degree line.
 F. EAP ex. China = East Asia and Pacific, ECA = Europe and Central Asia, LAC = Latin America and the Caribbean, MNA = Middle East and North Africa, SAR = South Asia, and SSA = Sub-Saharan Africa. Figure shows GDP-weighted averages that include 4 EAPs, 8 ECAs, 11 LACs, 8 MNAs, 4 SARs, and 7 SSAs (includes expanded sample with IIF data).
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EMDEs tend to be fixed rate, as opposed to floating rate bonds (Gozzi et al. 2015).

- Maturity.** Maturity of bonds and syndicated loans in EMDEs have remained stable over

FIGURE SF2.2 Corporate debt in EMDEs: Composition

Corporate debt in EMDEs has reached levels comparable to, if not exceeding, that of government debt. Outside of China, foreign currency debt has contributed substantially to the rise in EMDE corporate debt in recent years.



Sources: Bank for International Settlements, Institute for International Finance.

A.B. GDP-weighted averages for 16 EMDEs in A and 15 EMDEs in B.

C.D. Percentage point contribution of foreign and local currency-denominated corporate debt growth over the period denoted. GDP-weighted annual averages for 16 EMDEs in A and 15 EMDEs in B.

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the past decade (averaging about 7 years). Large firms were able to issue longer-term bonds, especially in the international capital markets (Cortina, Didier, and Schmukler, forthcoming). For smaller firms, the use of long-term finance remains limited compared to advanced economies (World Bank 2015).

Corporate debt in China has risen sharply, from 107 to 163 percent of GDP from 2006-2017 (Figure SF2.3). Although the stock of corporate debt has declined in the past two years, it remains elevated by international standards. The rise has been concentrated in the real estate, mining and construction sectors, and in state-owned enterprises. This was mostly financed domestically through the banking system as well as nonbank financial intermediaries. The increase in the corporate debt-to-GDP ratio was spurred by the economy's investment-intensive growth model

over most of the post-crisis period, and has contributed to overcapacity in some industries (Maliszewski et al. 2016).

Corporate investment growth has slowed sharply since 2012, both in state-owned enterprises and private enterprises. The slowdown in the former group has partly reflected policy-driven capacity cuts in highly indebted industrial sectors (World Bank 2017).

High corporate leverage in China has been associated with a deterioration of corporate financial performance. Policies that were adopted to address the associated vulnerabilities include macroprudential measures to tighten lending conditions for real estate, capacity reduction targets for heavy industries, and restructuring for weak state-owned enterprises. Use of bankruptcy procedures has also increased (IMF 2017a; Maliszewski et al. 2016).

Corporate debt and financial stability

Over the past decade, increased access to debt, especially non-bank credit, has partly reflected development of EMDE financial markets.⁸ However, as EMDE corporate debt has risen, risks to financial stability have grown in several dimensions, both external and domestic.

External dimensions. During most of the post-crisis period, debt service and financing costs were contained by low global interest rates and compressed risk premiums. Global, rather than firm- and country-specific factors, have been more important drivers of the increase in corporate debt (IMF 2015; Feyen et al. 2015; Ayala, Nedeljkovic, and Saborowski 2017). Countries that had experienced a higher rise in corporate debt also

⁸ For example, credit registry coverage has increased in EMDEs from an average of 4 percent of adults to 13 percent from 2006-2017, and has helped expand financial access (Love, Martínez Pería, and Singh 2013). These economies were also increasingly able to issue debt in the home currency (Hale, Jones, and Spiegel 2016). Other capital market developments in EMDEs are highlighted in Cortina, Didier, and Schmukler (forthcoming); Didier and Schmukler (2014); and Didier, Llovet Montanes, and Schmukler (2017).

tended to have more open capital accounts. Higher debt is also associated with riskier corporate balance sheets (Figure SF2.4).

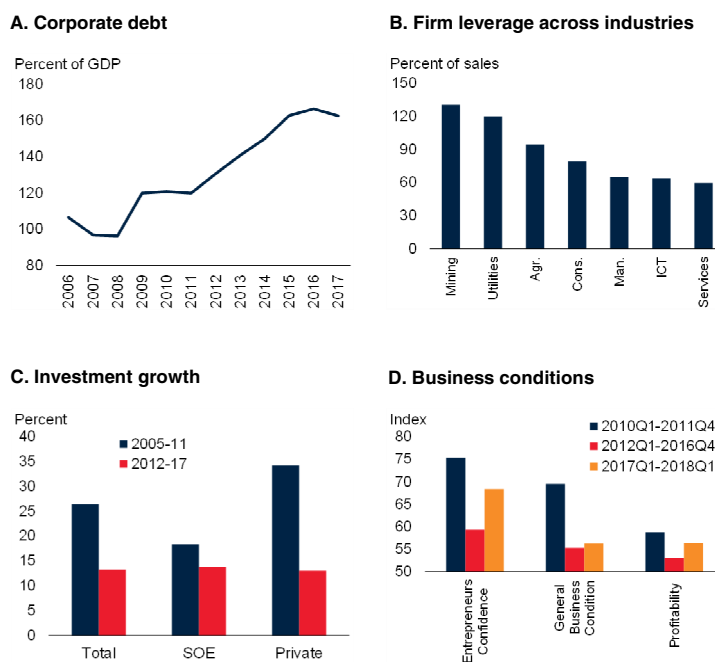
There is a risk of a disorderly tightening of global financing conditions as monetary policy normalizes among advanced economies (Chapter 1, Arteta et al. 2015). Funding conditions for EMDE corporates could significantly worsen, due to higher interest rates and risk premiums, and also the potential reversal of capital flows. Debt service cost may be especially sensitive to interest rates for floating rate bonds. A sharp appreciation of the U.S. dollar may also weaken balance sheets to the extent that foreign currency liabilities are not matched by assets. Many EMDE multinationals have issued bonds for intra-company financial intermediation across subsidiaries, channeling external financial conditions into the domestic financial system (Bruno and Shin 2017; Shin 2013).

Domestic dimensions. Although moderate levels of corporate debt can be benign, excessive levels of debt for individual corporations may affect bank balance sheets and banks' ability to extend credit, given bank debt still constitutes about four-fifth of outstanding EMDE corporate debt. The potential impact on loan supply could subsequently lower aggregate demand and collateral values. Higher corporate debt also has implications for the public sector balance sheet, given the contingent liability it may pose, especially during periods of crisis (World Bank 2016). This is especially relevant in developing economies, where implicit liabilities associated with state-owned enterprises are often not consolidated in official government debt statistics. In the majority of EMDEs that experienced sharp increases in corporate debt, public debt also rose sizably, as common factors like low global interest rates supported the expansion of both types of debt.

Largely accommodative financial conditions have supported a rapid rise in bond issuances in recent years. Although bond financing is less vulnerable than bank financing on some grounds, such as longer average maturity, it bears other vulnerabilities. These include weaker monitoring standards associated with the more dispersed

FIGURE SF2.3 Corporate debt in China

Corporate debt in China has risen sharply over the past decade, although it has stabilized in the past two years. Leverage has been particularly pronounced in heavy-industry sectors, such as mining and utilities. The increase in corporate debt coincided with a deceleration in investment growth and business conditions.



Sources: Bank for International Settlements, Haver Analytics, Orbis.

B. Agr. = Agriculture, Cons. = Construction, Man. = Manufacturing, and ICT = Information and communications technology. Figure shows medians across firms in 2015. Based on Orbis data sample for mostly non-state-owned private firms.

C. Figure shows period average annual nominal growth in fixed asset investment. "SOE" stands for state-owned enterprises. "Private" stands for private enterprises.

D. Figure shows period averages of quarterly data. China industrial enterprise survey of 5,000 leading enterprises to rate their perception on selected topics. An index reading higher than 50 indicates improvement.

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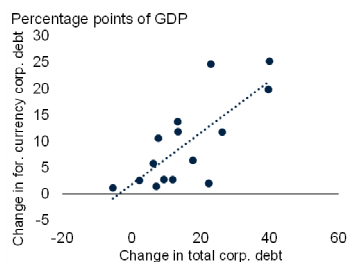
nature of bond investors, allowing more firms with weaker fundamentals to issue during benign financing conditions but raising vulnerabilities in a downturn. In the next three years, a rising amount of bonds maturing within one year also entails rollover risk if financial conditions tighten abruptly (Figure SF2.4).

Not only have corporate debt levels risen, evidence suggests that this debt has been disproportionately raised by firms that are risky, as measured by their low interest coverage ratios and other balance sheet distress indicators (Figure SF2.5; Feyen et al. 2017). Moreover, procyclical retrenchment by such firms can harm macroeconomic conditions, affect lenders (via reduced borrowing demand, and higher losses and non-performing loans) and

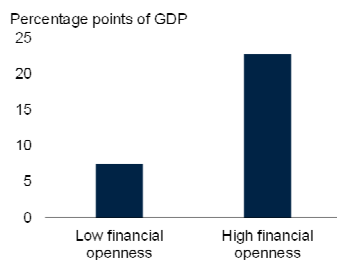
FIGURE SF2.4 Corporate debt in EMDEs: Macroeconomic vulnerabilities

In the majority of EMDEs, the corporate debt ratio has risen in tandem with an increase in foreign currency debt. The increase in the corporate debt ratio has been more pronounced in economies that had more open capital account and are associated with higher corporate vulnerability. Given a growing amount of international bonds is expected to mature in EMDEs over the next three years, rollover risks may rise if financial conditions tighten abruptly.

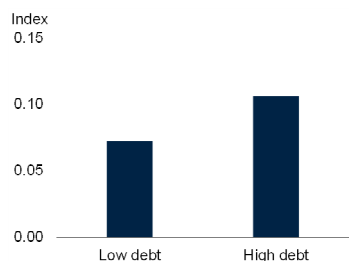
A. Change in corporate debt: Total vs. foreign, 2006-post-crisis peak



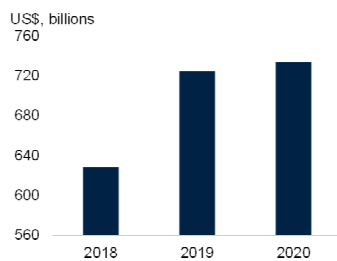
B. Change in corporate debt: Financial openness



C. Corporate Vulnerability Index: High and low debt



D. International corporate bonds maturing in one year: EMDEs



Sources: Bank for International Settlements, Chinn-Ito Index, Feyen et al. (2017), Haver Analytics, Institute for International Finance, World Bank.

A. Post-crisis peak is country- and indicator-specific and denotes the highest corporate/foreign currency corporate debt-to-GDP ratio in each country over 2010-17. Each dot refers to an economy. Excludes outliers.

B. Median corporate debt change from 2006-post-crisis peak year, which is country-specific. High/low financial openness cutoff is based on the median capital account restrictiveness index of Chinn and Ito (2006, updated to 2015), and for each country is measured over the average of 2010-15. Includes 16 EMDEs.

C. The corporate vulnerability index (CVI) tracks financial conditions of the non-financial corporate sector. The CVI uses firms' balance sheet information covering seven indicators: interest coverage ratio, leverage ratio, net debt-to-EBIT ratio, current-to-long term liabilities ratio, quick ratio, return to assets, and market-to-book ratio. The CVI ranges from 0 (i.e., firms in a particular country are not financially vulnerable in any of the seven indicators) to 1 (i.e., all firms in a particular country are financially vulnerable in all seven indicators). For more details, see Feyen et al. (2017). Y-axis denotes medians. Includes 16 EMDEs for 2010-17. High/low debt cutoff is based on medians.

D. Denotes amount of international bonds outstanding with remaining maturity of 12 months in each year denoted (data as of 2018Q1). Includes 54 EMDEs.

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impact government finances via cyclical revenue weakness. This suggests that higher corporate leverage can make the corporate sector more vulnerable to weaker growth or higher debt service costs. Stress tests on EMDE corporates have shown that a combination of exchange rate shocks and weaker-than-expected growth could significantly erode firms' interest coverage ratios and an interest rate shock may boost the share of

risky debt from 25 to 31 percent (Chow 2015; Beltran, Garud, and Rosenblum 2017). These vulnerabilities may be mitigated to some extent, however, by improvement in corporate profitability in 2017 (IMF 2018).

Leverage in the EMDE corporate sector is highly heterogeneous and has been concentrated in a number of industrial sectors, such as construction and utilities. Domestically-owned firms exhibit higher leverage than multinationals, which can access funds via intra-company borrowing across affiliates within the conglomerate (e.g., Desai, Foley, and Forbes 2008). Large firms account for nearly four-fifth of corporate debt.⁹ Exchange-listed firms account for about one-quarter of debt. High concentrations of debt in large and interconnected firms can amplify systemic risks, even if corporate debt were moderate in aggregate.

Corporate debt and economic growth

Analytical linkages

Elevated corporate debt in EMDEs not only poses risks for financial stability, it also poses the risk of dampening investment and long-term growth.¹⁰ The increase in China's corporate debt has raised concerns regarding investment efficiency, especially among state-owned enterprises (Maliszewski et al. 2016). In India, high corporate leverage has been concentrated in a number of industries (e.g., mining, transportation, construction), and may have been a significant factor behind weak private investment growth (Das and Tulin 2017). In Brazil, high corporate leverage also contributed to

⁹ Large firms are defined as those with assets greater than \$50 million, similar to the criteria used by the European Union. Results are not sensitive to alternative measures of large firms, such as those defined by the International Finance Corporation (IFC) (larger than \$15 million). In robustness checks of the empirical analysis, the sample was broken into small, medium, and large firms based on the IFC criteria, but there is no significant differences between small and medium-sized firms.

¹⁰ See Acharya et al. (2015); World Bank (2016); IMF (2015); Feyen et al. (2017); de Mooij and Hebous (2017); Demirgüç-Kunt, Martínez-Peria, and Tressel (2015); Alter and Elekdag (2016); Brown and Lane (2011); Beltran, Garud, and Rosenblum (2017); Corsetti et al. (2015); Alfaro, Asis, Chari, and Panizza (2017); and Occhino and Pescatori (2015).

weak investment during 2014-early 2017 (IMF 2017b).

Indeed, since 2011, EMDEs in general have experienced weak private investment growth. Further, countries that had more elevated corporate debt in the 2011-17 period showed lower average private investment growth (Figure SF2.6).¹¹

Although debt flows may help finance investment, an excessively large stock of debt may eventually constrain investment by creating conflicts of interest between equity and debt holders (Myers 1977). This conflict arises because the larger a firm's debt, the greater the extent to which equity holders need to share the fruits of that investment with debt holders. This reduces the attractiveness of investment from the perspective of the equity holders, possibly leading to underinvestment even in value-enhancing investment projects.

In the subsequent firm-level analysis, the measure of debt overhang is defined as the ratio of total debt to earnings before interest and taxes (EBIT), where total debt is the sum of current liabilities and long-term debt. This measure includes both bonded and bank debt, and conforms to the basic insight that a firm is more likely to experience debt overhang when its debt relative to earnings is high (Myers 1977). The measure of debt overhang used here more closely accounts for a firm's debt relative to earnings capacity than a simple measure of leverage.¹² The analysis confirms that firms with high debt overhang tend to have lower net investment rates (Figure SF2.6).

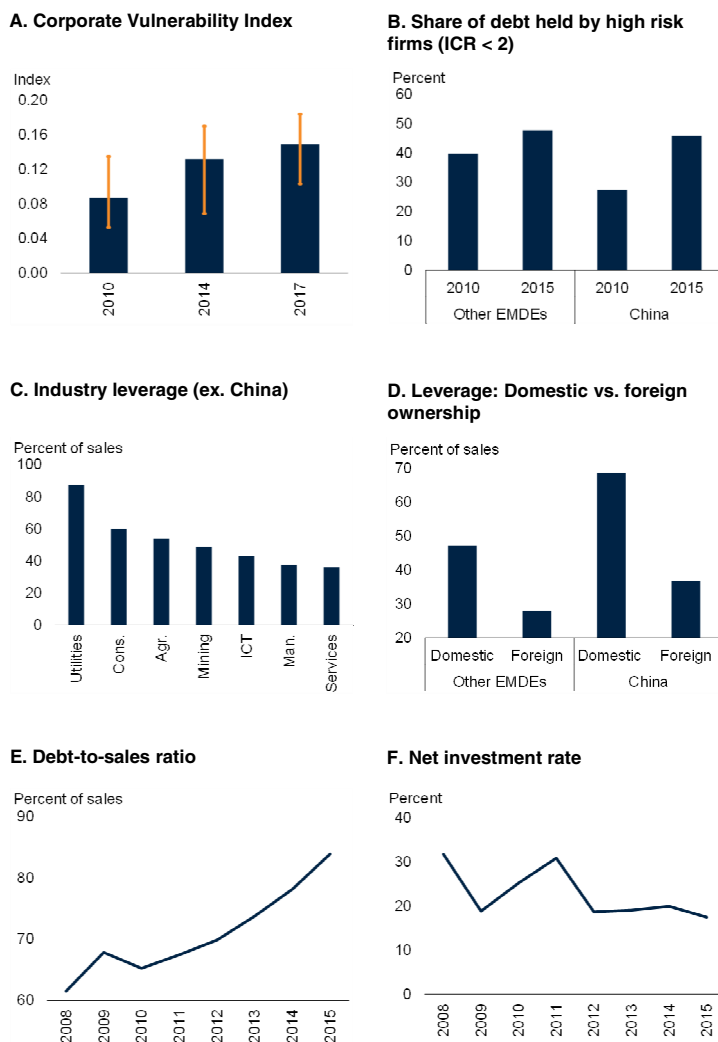
While the theory that corporate debt overhang dampens investment dates back several decades, the empirical literature on the linkage in EMDEs

¹¹This relationship does not appear to have been driven by differences in cross-country growth, as countries with a higher corporate debt-to-real-GDP growth ratio, a proxy for "corporate debt efficiency," also experienced lower private investment growth. A similar metric was used to assess investment efficiency for China by Maliszewski et al. (2016).

¹²This analysis draws on Borensztein and Ye (forthcoming). Other works that have used this measure to proxy for debt overhang include IMF (2018); Chen and Lu (2016); and Kalemlı-Ozcan, Laeven, and Moreno (2015). In the baseline specification, results on leverage are consistent with literature that uses leverage as a proxy for a debt constraint and finds a negative relationship between leverage and investment (Das and Tulin 2017; Magud and Sosa 2015).

FIGURE SF2.5 Corporate debt riskiness in EMDEs

Not only has corporate debt become more elevated, but the share of debt held by high-risk firms has also increased. Corporate leverage is particularly high in industrial sectors, such as utilities and mining. Leverage is also significantly higher in domestic firms as compared to multinationals, which have greater access to internal capital markets via affiliates.



Sources: Feyen et al. (2017), Haver Analytics, Orbis, World Bank.

A. The corporate vulnerability index (CVI) tracks financial conditions of the non-financial corporate sector. The CVI uses firms' balance sheet information covering seven indicators: interest coverage ratio, leverage ratio, net debt-to-EBIT ratio, current-to-long term liabilities ratio, quick ratio, return to assets, and market-to-book ratio. The CVI ranges from 0 (i.e., firms in a particular country are not financially vulnerable in any of the seven indicators) to 1 (i.e., all firms in a particular country are financially vulnerable in all seven indicators). For more details, see Feyen et al. (2017). Includes 47 EMDEs. Medians. Vertical lines indicate interquartile range.

B. Denotes share of total debt held by firms with interest coverage ratio (ICR) less than 2 (threshold for "risky" firms). Based on a balanced sample of firms for 13 EMDEs.

C.D. Firm total debt scaled by sales. Median across firms in 2015. Based on all available firm-level data in Orbis for 13 EMDEs.

C. Agr. = Agriculture, Cons. = Construction, ICT = Information and communications technology, and Man. = Manufacturing.

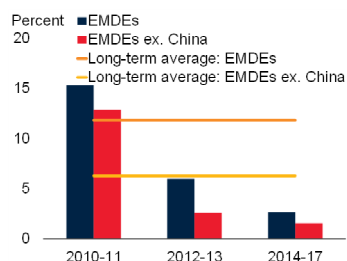
E.F. Sales-weighted averages of debt-to-sales ratio and net investment rate based on a fully balanced sample of firms over 2008-15.

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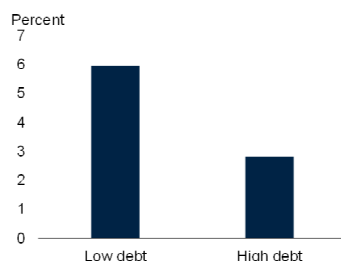
FIGURE SF2.6 Correlates of corporate debt and private investment growth in EMDEs

Increased corporate debt in EMDEs has coincided with a period of weak private investment growth after 2011. Elevated corporate debt has been associated with weaker private investment growth, both at the macroeconomic and microeconomic levels. This relationship is not driven by differences in country-level growth performance or firm-level earnings.

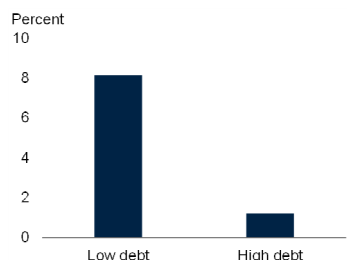
A. Private investment growth: EMDEs



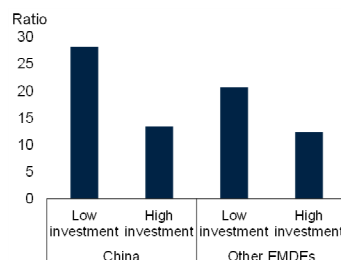
B. Private investment growth: High and low corporate debt, 2011-17



C. Private investment growth: High and low corporate-debt-to-real-GDP growth ratio, 2011-17



D. Debt to earnings in low and high investment firms



Sources: Bank for International Settlements, Haver Analytics, International Monetary Fund, Institute for International Finance, Orbis, Oxford Economics, World Bank.

A. GDP-weighted average of 12 EMDEs (available data among BIS corporate debt sample countries). Data are estimates for some EMDEs. Long-term average refers to 1995-2008. Period average of annual growth rates.

B. High-low denotes country-year observations of corporate debt-to-GDP ratio above/below the median. Includes 16 EMDEs. Data are not available for 2016-17 for some economies. Y-axis denotes median private investment growth.

C. High-low denotes country-year observations of corporate debt-to-GDP ratio to real GDP growth above/below the median. Includes 16 EMDEs. Data are not available for 2016-17 for some economies. Y-axis denotes median private investment growth.

D. Low and high investment rates denote the bottom and top one-thirds, respectively, of the investment rate distribution. Inverse of median EBIT (3-year smoothed average) to debt ratio in 2015. Investment denotes net investment. Based on all available data in Orbis for 13 EMDEs.

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is more recent. A few papers report that leverage contributes to weak investment growth in EMDEs (e.g., World Bank 2017; IFC 2016; Magud and Sosa 2015; Das and Tulin 2017). At the firm level, Magud and Sosa (2015) and IFC (2016) introduce a debt variable for a cross section of listed firms in various EMDEs, and found a negative relationship between leverage and investment. Kalemli-Ozcan, Laeven, and Moreno (2015) test the effect on fixed investment of corporate debt (relative to current earnings) for a

broad sample of European firms in the aftermath of the financial crisis.¹³

This analysis attempts to expand upon this literature by studying the reaction of investment to debt overhangs by both large and small private firms for a diverse sample of large emerging and developing economies, and subsequently exploring two cross-sectional dimensions that may affect the sensitivity of investment to debt overhangs: size and leverage.

Building on the macroeconomic trends and correlates highlighted earlier, the next section will analyze the extent to which future profits are put at risk by high levels of debt and may discourage investment at the micro-level. The analysis employs data covering a large sample of companies that include both large, publicly-traded and smaller, privately-owned firms for a diverse group of EMDEs.

Empirical findings

Firm-level fixed effects panel estimation is conducted to estimate the relationship between debt service capacity (inverse of “debt overhang”) and investment activity. Net investment for a broad cross-section of private and public firms in 13 EMDEs is modelled as a function of the ratio of EBIT to total debt, in addition to a number of standard correlates that are associated with investment (e.g., sales growth, cash flows), based on 2007-2015 data. The analysis includes fixed effects at the firm- and country-industry-year levels, which further control for other observed and unobserved factors that may impact investment activity, such as macroeconomic shocks (See Annex SF2.1 for more details on the data and empirical methodology). In the baseline specification, the analysis examines the relationship between debt service capacity and investment, conditional upon leverage.

Linkage between corporate debt and investment. The results suggest that debt overhangs are negatively associated with investment across EMDE firms. In

¹³ Kalemli-Ozcan, Laeven, and Moreno (2015) is grounded on a similar framework but focuses on European firms in a crisis setting.

other words, debt service capacity is positively (and significantly) associated with net investment (Table SF2.1). This relationship is robust for samples that include and exclude China, although the sensitivity is smaller for the China sample.¹⁴ Furthermore, the relationship is not sensitive to the inclusion of cash flow or leverage as explanatory variables in the regression equation, although the magnitude decreases slightly once controlling for these two variables. The result is not driven by volatility in earnings over time (see Annex SF2.1).

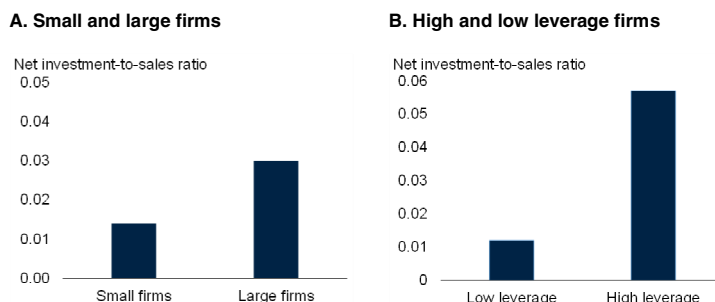
In the full sample, the magnitude of the coefficient implies that an increase in debt service capacity from the 10th percentile to the 90th percentile is associated with about 1.4 percentage point higher net investment to sales ratios. In the China and non-China samples, this interquartile increase is associated with about 1 percentage point and 2 percentage points higher investment rates, respectively. These sensitivities amount to about one-third of the average level of net investment-to-sales ratio in both the China and non-China sample.

In aggregate, debt overhang is associated with 16 percent of the decline in the net investment-to-sales ratio in the sample from 2011-2015. This effect was concentrated in the China sample, however, where deterioration in debt service capacity is higher than the non-China sample and is associated with about one-fifth of the decline in investment from 2011-15.

Small and large firms. The analysis also examines whether the debt overhang-investment sensitivity varies across small and large firms, as a large literature in macroeconomics and finance has established the importance of size for determining a firm's access to credit (e.g., Chodorow-Reich 2014; Gertler and Gilchrist 1994). Large firms, defined as firms with assets above \$50 million, tend to enjoy wider access to both bank credit and bond markets, and thus may be more likely to

FIGURE SF2.7 Linkage between debt overhang and investment across firms

Investment is more sensitive to corporate debt service capacity among large firms and firms that are highly indebted.



Sources: Orbis, World Bank.

A. Denotes sensitivity of net investment to debt service capacity (in response to one percentage point increase in debt service capacity), based on the specification in eq. (1) in Annex for small and large firms. Large firms are defined as firms with assets greater than \$50 million and include one fifth of the sample. See text for more details.

B. Denotes sensitivity of net investment on debt service capacity (in response from one percentage point change in debt service capacity) based on the specification in eq. (1) in Annex, under low and high leverage. High-low leverage cutoff is based on the median within a country-industry pair, and thus the share of highly leveraged firms is 50 percent. See text for more details.

[Click here to download data and charts.](#)

increase their liabilities and run into a debt overhang when a serious shock hits. This is evident by the disproportionate amount of debt they hold. Large firms may also be more exposed to international financial and goods markets, and thus be more sensitive to debt service costs associated with fluctuations in global financing conditions. Focusing on large firms is also warranted for policy implications, as a growing literature has shown that large firms' performance can have a systemic impact and is more correlated with aggregate growth of an economy (Gabaix 2011), can be more sensitive to macroeconomic shocks (Alfaro et al. 2017), and serve as a key channel for foreign shocks transmission (di Giovanni, Levchenko, and Mejean 2014, 2018).

By estimating the baseline equation for small and large firms separately, the analysis finds that the debt overhang effect is present among both groups (Figure SF2.7). The coefficients for large firms in both the overall and non-China sample are larger than those of smaller firms, although the coefficient is not significant for China's large firms. Estimates of the full regression show that the debt overhang impact on investment among large firms is twice that of small firms. This suggests that larger firms are more sensitive to debt

¹⁴ The firm-level data for China contained only a limited number of state-owned enterprises. Thus, the data are more reflective of the debt service capacity to investment sensitivity among firms in the non-state-owned private sector.

overhang, and that the consequences from their disproportionate undertaking of leverage may outweigh the advantage they have in terms of better access to finance.

Low and highly indebted firms. Since the effect of debt overhangs may be nonlinear, the analysis examines whether the sensitivity varies across high and low-leverage firms. The threshold for high and low levels of debt is defined as the median within a country-industry pair, given that leverage levels may be to some extent driven by the business structure and operational needs of an industry. The debt overhang sensitivity is found to be larger for firms with high debt levels, and moreover, the effect of debt overhang is nearly three times higher in high-debt firms than low-debt firms (Figure SF2.7). These results suggest that the sensitivity of investment to debt overhang can vary significantly, conditional upon pre-existing leverage levels. At high levels of debt, the debtor-equity holder conflict becomes more prominent, as a greater proportion of positive net present value (NPV) projects needs to be paid back to creditors. This means that debt service capacity becomes more binding, and causes higher cutbacks in investment when debt is high.¹⁵

Overall, the results suggest that the debt overhang channel is a vulnerability for investment across EMDE firms. This linkage is especially pronounced in large firms and highly leveraged firms.¹⁶

Policy implications

This Special Focus points to both financial stability and growth-related challenges facing policymakers in countries where corporations exhibit high debt levels. To reduce financial

stability risks associated with elevated corporate debt, cyclical and prudential policies need to be the primary lever. To lift investment activity and mitigate the medium-term consequences of corporate debt overhang, structural policies geared toward promoting financial development are appropriate.

Cyclical policies

Fiscal policy. Corporate distress, such as defaults arising from debt overhang, can provoke the government to provide sizable financial support and contribute to larger public debt burdens (World Bank 2016). This can cause public borrowing costs to rise and fiscal space to shrink, and can force governments to tighten fiscal policy during times of weak growth. Fiscal space in EMDEs has deteriorated during the post-crisis period, even as corporate debt ratios have risen (Figure SF2.8). This suggests that the risk of corporate debt distress is an additional argument for boosting or at least maintaining fiscal buffers in the present environment as insurance against corporate distress.

Prudential policy. The analysis suggests that large firms have taken on a disproportionate share of aggregate debt stock, raising the possibility that there could be financial stability implications if these firms faced balance sheet distress. This argues for increased stress testing of corporate balance sheets and greater monitoring of the largest firms, especially their foreign exchange hedging and liquidity management. These types of policies can increase the scope for adequate preparation for possible corporate distress. They can help to reduce the potential disruptions that could result from tightening advanced-economy financial conditions and increased volatility of international financial flows. Preemptive policies that improve bank risk management and lending practices, such as liquidity requirements in the Basel III accord or caps on foreign currency exposure on bank balance sheets, would help constrain bank risky borrowing (BIS 2013). These policies help prevent EMDE corporates from taking on excessive debt under benign financing conditions and periods of high corporate profitability.

¹⁵ An alternative to exogenously-specified debt thresholds is to allow for endogenous thresholds in the relationship between debt service capacity and investment. Threshold regressions following Hansen (1999) based on a balanced sample also suggests a similar nonlinear relationship between debt service capacity and investment under low and high levels of debt to sales ratio.

¹⁶ The analysis also experiments with sensitivity of debt service capacity to investment across countries of varying financial development, creditor rights protection, and public debt levels. The analysis does not find consistent evidence that this sensitivity varies significantly along these lines.

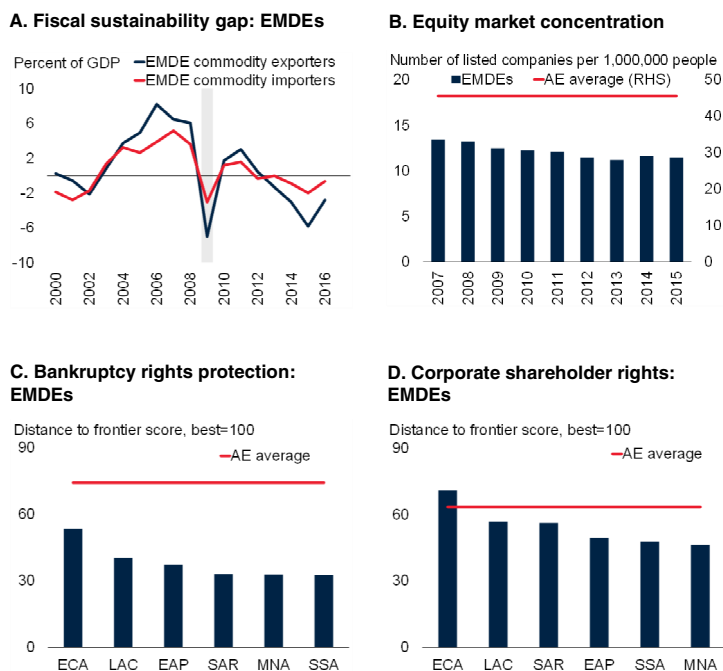
Structural policies

The foregoing analysis illustrates the potential for excessive corporate debt to dampen private investment. There are a number of structural policy options that can help reduce this risk:

- Most tax systems favor the use of debt over equity by providing tax deductibility for interest payments. Policies such as “thin capitalization rules,” which limit the amount of debt companies can issue relative to equity, have been found to be effective in lowering debt ratios and reducing financial distress under certain conditions (de Mooij and Hebous 2017).
- The quality of debt could be increased by improving credit information and collateral registries to shorten collateral recovery times and reduce default losses. These policies help improve credit-relevant information flows and break down information asymmetries, and thereby help channel more credit to those firms that lack access to credit, especially among small- and medium-sized enterprises (SMEs).
- Many EMDEs have not developed their equity markets to full potential in part because of regulatory burdens that discourage new listings and weaknesses in corporate governance and shareholder rights that undermine the integrity and liquidity of stock markets. Addressing these shortcomings would strengthen equity markets and mitigate debt biases. Equity financing helps increase firms’ resilience, improves their creditworthiness, and lessens the risk of large-scale, broad-based, and correlated corporate retrenchments. Promoting a more balanced debt/equity mix and incentivizing equity financing may be particularly relevant for small firms, which tend to rely mostly on bank and internal financing.
- An excessive accumulation of corporate debt can occur when explicit or implicit state guarantees are too generous, and when bankruptcy regimes do not allow quick and fair debt workouts for companies. Overall,

FIGURE SF2.8 Policy implications

Fiscal space has deteriorated in EMDEs since the crisis, which may increase the costs of financial support in cases of systemic corporate distress. Policies to promote equity market development in EMDEs, including strengthening corporate shareholder rights, can help achieve a more balanced debt/equity mix. Strengthening bankruptcy protection, which lags behind global best practices in EMDEs, may help contain corporate distress costs from debt overhang.



Sources: International Monetary Fund, World Bank.
 A. Simple averages. A sustainability gap is defined as the difference between the actual fiscal balance and the debt-stabilizing balance (Kose et al. 2017). Sustainability gaps are measured under current conditions. The year of global recession (2009) is shaded in gray.
 B. Number of listed companies per 1,000,000 people.
 C.D. AE = Advanced Economies, EAP = East Asia and Pacific, ECA = Europe and Central Asia, LAC = Latin America and the Caribbean, SAR = South Asia, and SSA = Sub-Saharan Africa. Denotes year 2017. Distance to frontier score based on World Bank *Doing Business* report.
 C. Distance to frontier score for strength of insolvency resolution. AE, EAP, ECA, LAC, MNA, SAR, SSA include 37, 20, 19, 28, 16, 8, and 44 economies, respectively.
 D. Distance to frontier score for strength of shareholder rights protection. AE, EAP, ECA, LAC, MNA, SAR, SSA include 37, 20, 21, 29, 16, 8, and 44 economies, respectively.
[Click here to download data and charts.](#)

EMDE bankruptcy protection law lags international best practices, implying scope for policy reforms in this area. Historical experience suggests strengthening bankruptcy protection can boost investment activity and facilitate responsible corporate risk-taking, helping to relieve the costs of debt overhang (e.g., Gopalan, Mukherjee, and Singh 2016; World Bank 2014). For small firms, these policies should also promote long-term financing, which has been limited in EMDEs (World Bank 2015). Recent reforms in

bankruptcy procedures have occurred in several EMDEs, including the introduction of a new bankruptcy law in Egypt, strengthening

of secured creditors' rights in India, and setting up new restructuring mechanisms in Poland (IMF 2017c; World Bank 2018b).

TABLE SF2.1 Debt overhang and investment: Baseline specification

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	all	all	all	all	ex China	ex China	ex China	ex China	China	China	China	China
Debt overhang (inverse)	0.020*** (0.002)	0.018*** (0.002)	0.017*** (0.003)	0.017*** (0.003)	0.033*** (0.006)	0.028*** (0.005)	0.030*** (0.006)	0.027*** (0.006)	0.009*** (0.002)	0.009*** (0.002)	0.007*** (0.002)	0.007*** (0.002)
Cash flows			0.068*** (0.026)	0.034 (0.027)			0.045 (0.031)	0.013 (0.032)			0.126*** (0.043)	0.105** (0.042)
Leverage		-0.013*** (0.002)		-0.013*** (0.002)		-0.013*** (0.002)		-0.013*** (0.002)		-0.017*** (0.005)		-0.016*** (0.005)
Maturity	-0.081*** (0.013)	-0.068*** (0.013)	-0.083*** (0.013)	-0.068*** (0.013)	-0.106*** (0.020)	-0.088*** (0.020)	-0.108*** (0.020)	-0.089*** (0.020)	-0.045*** (0.012)	-0.039*** (0.012)	-0.047*** (0.012)	-0.040*** (0.012)
Sales growth	0.013*** (0.001)	0.013*** (0.001)	0.014*** (0.002)	0.013*** (0.002)	-0.001 (0.003)	-0.002 (0.003)	-0.001 (0.003)	-0.002 (0.003)	0.024*** (0.001)	0.024*** (0.001)	0.024*** (0.001)	0.024*** (0.001)
Size	-0.057*** (0.005)	-0.083*** (0.005)	-0.059*** (0.005)	-0.083*** (0.005)	-0.050*** (0.007)	-0.082*** (0.008)	-0.052*** (0.007)	-0.083*** (0.008)	-0.057*** (0.005)	-0.076*** (0.006)	-0.054*** (0.006)	-0.073*** (0.006)
Observations	453,793	453,793	453,793	453,793	241,173	241,173	241,173	241,173	212,620	212,620	212,620	212,620
R-squared	0.361	0.362	0.361	0.362	0.353	0.354	0.353	0.354	0.388	0.389	0.388	0.389

All right hand side variables are lagged by one year. Clustered standard errors by firm in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Notes: Dependent variable is net investment to sales ratio. Debt overhang (inverse) denotes the ratio of earnings before interest and taxes (EBIT) to total debt. Cash flows is EBIT-to-sales ratio. Leverage is total debt-to-sales ratio. Maturity is the ratio of long-term debt to total debt, Size is log of sales. EBIT is three-year smoothed average. Regressions include firm and country-sector-year fixed effects. Regression sample includes 129,687 firms.

Annex SF2.1 Data and methodology: Firm-level analysis

Data

The firm-level analysis is based on data from ORBIS, produced by Bureau van Dijk Electronic Publishing (BvD). The sample contains firm-level balance sheet information in 13 large EMDEs across Africa, Asia, Europe, and Latin America. The countries include Brazil, China, Colombia, Hungary, India, Malaysia, Mexico, the Philippines, Poland, the Russian Federation, South Africa, Thailand, and Turkey. The balance sheet information comes from regulatory and other sources (e.g., local chambers of commerce).

The sample is an unbalanced panel based on data for 2007-2015. In contrast to most other major firm-level databases (e.g., *Worldscope*), most firms in the sample are non-publicly-listed firms (more than 95 percent). About 90 percent of firms in the sample have an asset size below \$50 million (the cutoff for “large firm”). Industry-level information is available based on the NACE Rev. 2 classification.

A limitation of the Orbis dataset is that it does not comprise the full universe of firms in the EMDE sample considered, and hence may not necessarily reflect the entire corporate sector in these economies. Nevertheless, compared to other standard firm-level datasets, it covers a much larger sample of private firms, which are important drivers of economic activity in the EMDE corporate sector.¹⁷

The primary aim of the firm-level analysis is to take advantage of the dataset’s highly granular cross-sectional structure and employ a rich set of interactive fixed effects. It also aims to control for factors that are intrinsic to industry operations or demand, as well as to explore heterogeneity in corporate debt behavior across firms.

The dataset comprises those firms in the ORBIS database that have available data on fixed assets,

¹⁷ Based on a balanced sample for the sample as a whole, however, their trends in debt and net investment broadly reflect that of the aggregate (Figure SF2.5). The empirical results are also robust to estimation based on a balanced sample.

long-term corporate debt, earnings before interest and taxes (EBIT), and total assets (above \$5 million) in at least one year over the sample period. A cleaning procedure similar to Kalemlı-Ozcan, Laeven, and Moreno (2015) is conducted to generate a usable dataset, including the following:

1. drop company-years that simultaneously lack data on total assets, sales, and employment.
2. drop entire company for all years if total assets, employment, sales, tangible fixed assets, or fixed assets is negative in any given year.
3. drop companies denoted as non-profit organizations
4. change value to “missing” if long-term debt or current liabilities are negative.

This yields an unbalanced sample of 434,256 firms. In the non-China sample, the number of firms in each country is not dominated by any particularly country.¹⁸ All observations are winsorized (transformed by limiting extreme values) at the 1 percent level to prevent the impact of extreme outliers.

Methodology

Investment is measured from data on the stock of fixed assets. Thus, investment is measured on a net basis, calculated as the annual difference in fixed assets (deflated in real terms, scaled by real sales). Total debt is defined as the sum of long-term debt plus current liabilities. The primary debt overhang variable is measured as the ratio of a rolling three-year average of earnings before interest and taxes (EBIT) to current total debt, which is an indicator of the size of accumulated debt relative to expected

¹⁸ The sample comprises 6,758 firms in Brazil, 225,699 firms in China, 11,245 firms in Colombia, 6,677 firms in Hungary, 19,886 firms in India, 21,268 firms in Malaysia, 1,246 firms in Mexico, 5,345 firms in the Philippines, 19,487 firms in Poland, 87,402 firms in Russia, 228 firms in South Africa, 19,711 firms in Thailand, and 9,304 firms in Turkey. In the full baseline regression, constraints on data availability across all variables yields a firm sample of about 130,000 firms.

profits (Myers 1977). In the regression framework, this variable is expressed as the ratio of EBIT to total debt rather than its reciprocal to avoid problems in cases where EBIT may be equal to or close to zero.

To examine the sensitivity of investment to debt overhang, the baseline estimating equation is as follows:

$$y_{cijt} = a_0 + a_1 \text{Overhang}_{cij,t-1} + X_{cij,t-1} \delta + u_i + v_{cjt} + \varepsilon_{cijt} \quad (1)$$

where y_{cijt} denotes the net investment rate of firm i , industry j , country c , and year t . Overhang_{cijt} denotes the benchmark measure of firm debt overhang as described earlier. In other words, Overhang_{cijt} measures the debt-service capacity of a firm. A higher value of a_1 thus implies a higher sensitivity of investment to debt-service capacity. $X_{cij,t-1}$ denotes a vector of control variables, which include firm size (log of total sales in U.S. dollars), sales growth, cash flows (EBIT-to-sales ratio), leverage (debt-to-sales ratio), and debt maturity (ratio of long-term debt to total debt). Long-term debt is defined in the dataset as debt held by each firm with residual maturity greater than one year. These variables are considered standard control

variables in the corporate finance literature. ε_{cijt} is the error term. The standard errors in the benchmark specification are clustered at the firm level, but the results are robust to clustering at the country-industry level. Given that the debt overhang measure includes EBIT as well as total debt, it may be correlated to some extent with cash flow and leverage. Thus, these two variables are included sequentially to check the robustness of the debt overhang sensitivity.

Given the well-known volatility of EBIT, a three-year rolling average is used in calculating this variable. The result is also robust to a measure of debt overhang where each firm's sample average EBIT is used for all years. All variables on the right-hand side are lagged by one period. The specification also includes firm fixed effects, u_i , and country-industry-year fixed effects, v_{cjt} , to control for firm-level time invariant heterogeneity and a rich set of unobserved and observed time-varying factors at the country-industry level, respectively. These factors may include, for example, industry demand effects or macroeconomic shocks. The estimations are also conducted for China and non-China separately.

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