Emerging Market Corporate Leverage

and

Global Financial Conditions[1]

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Abstract

Corporate debt in emerging markets has risen significantly in recent years amid accommodative global financial conditions. This paper studies the relationship of corporate leverage growth in emerging markets (EMs) to U.S. monetary conditions, and more broadly, to global financial conditions. We find that accommodative U.S. monetary conditions are reliably associated with faster EM leverage growth during the past decade. Specifically, a 1 percentage point decline in the U.S. policy rate corresponds to an appreciable increase in EM leverage growth of 9 basis points, on average (relative to the sample average leverage growth of 35 basis points per year). This impact is more pronounced for sectors dependent on external financing, for SMEs, and for firms in more financially open EMs with less flexible exchange rates. The findings suggest that global financial conditions affect EM firms' leverage growth in part by influencing domestic interest rates and by relaxing corporate borrowing constraints.

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I. INTRODUCTION

Corporate leverage in emerging markets has risen sharply in recent years amid exceptionally favorable global financial conditions. In fact, the corporate debt of nonfinancial EM firms quadrupled from about US$5 trillion in 2006 to almost US$20 trillion in 2015, with China being the lead actor (Figure 1). Likewise, the EM corporate debt-to-GDP ratio has also risen by more than 30 percentage points in the same period. In a comprehensive survey of the literature, which predominantly focuses on advanced economies, Frank and Goyal (2009) identify the most reliable determinants of corporate leverage. In particular, for the United States, these include firm-, sector-, and country-level determinants.[2] We seek to complement this vast literature by investigating whether global financial conditions—such as global monetary conditions—influence leverage growth in emerging markets (EMs).

Conceptually, accommodative global monetary conditions can encourage EM leverage growth via several related, and potentially mutually reinforcing channels. Since Calvo, Leiderman, and Reinhart (1993), studies have argued that monetary policy loosening in advanced economies (AEs) is typically accompanied by greater EM capital inflows. For example, if central banks cut interest rates to mitigate appreciation pressures when confronted with large capital inflows, the ensuing lower domestic interest rates would then encourage corporate borrowing as it stimulates demand. At the same time, favorable global monetary conditions can foster leverage growth by relaxing financial (borrowing) constraints. In particular, firms that are most dependent on external finance for their business operations, which would likely include small- and medium-sized enterprises (SMEs) and/or companies with limited collateral to pledge, stand to benefit the most from accommodative global financial conditions, and would more likely disproportionately increase their leverage ratios relative to other types of firms.

Recent changes in transmission channels of shocks and spillovers from AEs to EMs are particularly relevant for monetary policy and financial stability. For instance, the role of risk taking channel, also known as international credit channel, has been especially important in the aftermath of the Global Financial Crisis (GFC). Several studies point at a potential link between lax monetary policy conditions and excessive risk-taking behavior. In order to earn excess returns in a low interest rate environment, investment managers and bankers may adopt strategies

[2] Specifically, these determinants include profitability, firm size, tangibility, market-to-book assets ratio (firm-level), industry median leverage, and (country-level) expected inflation (see Frank and Goyal, 2009) for further details. See also Titman and Wessels (1988), Harris and Raviv (1991), Lemmon, Roberts, and Zender (2008), Graham, Leary, and Roberts (2015), Oztekin (2015), and De Angelo and Roll (2015).

which focus on risky securities such as EM corporate bonds ("search for yield"); see, for example, Rey (2015), Bekaert, Hoerova, and Lo Duca (2013), Feyen et al. (2015), or Gozzi et al. (2015).[4] Moreover, the composition of capital flows has changed over the past decade, with the share of bond financing increasing substantially.[5] Roughly half of the new EM firm financing has occurred offshore where companies issued foreign currency bonds, mostly denominated in US dollars (Avdjiev et al., 2017; Fuertes and Serena, 2016; McCauley, McGuire, and Sushko, 2015). The latter development contrasts the decline in cross-border bank lending, driven primarily by supply factors.[6]

Nevertheless, at a more granular level, there is a gap in the existing literature which we intend to fill in this paper. On one hand, we shed light on the main recipients of international capital flows and, on the other hand, institutional factors and channels which can amplify or mitigate these flows to EM firms are emphasized. This is particularly relevant given the upcoming balance sheet normalization and monetary policy tightening by central banks in AEs which has the potential to partially reverse capital flows to EMs and amplify financial volatility, especially where risks and leverage have been built excessively. Against this background, a key policy debate concerns to what extent are EM firms vulnerable to currency and rollover risks given the recent buildup in corporate leverage and the potential reversal in capital flows.

Accordingly, the main question this paper addresses is the following: Are more accommodative global financial conditions associated with higher EM corporate leverage growth? In addition, our empirical framework sheds light on the following questions: What is the role of country-specific characteristics such as financial openness or the exchange rate regime? What can we say about the channels through which global financial conditions influence EM leverage growth?

Our empirical analysis begins by regressing leverage growth against a measure of global financial conditions, standard firm-level determinants of leverage, and other controls using panel data from more than 400,000 firms (including small- and medium-sized enterprises, SMEs) in 24

[4] See also Aizenman, Chinn, and Ito (2016), Cerutti, Claessens, and Puy (2015), and Cerutti, Claessens, and Ratnovski (2017).

[5] However, bank loans remain the main source of financing for EM firms. Note that, as documented in IMF (2016), portfolio equity inflows, another source of corporate finance, remained negligible throughout 2000-15 for a major of EMs.

[6] Global banks continued to strengthen their balance sheets in order to satisfy new regulatory requirements, which led to the retrenchment from cross-border activities in the aftermath of the Global Financial Crisis (IMF 2015a).

EMs.[7] Initially, we proxy global financial conditions using a measure of the U.S. monetary policy stance, as is common in the literature, but we consider other indicators as well, including "shadow rates" and estimated monetary policy shocks. This setup helps sharpen identification because global monetary conditions can be seen as exogenous to any individual EM firm. Furthermore, to help distinguish the role of global financial conditions from other global factors, we differentiate firms based the degree of financial constraints they face (including, for example, firms' dependence on external finance). This differentiation facilitates identification because it is more likely that global financial conditions would disproportionately affect more financially constrained firms as compared to, for instance, global growth or commodity prices fluctuations.

We find compelling evidence suggesting that accommodative U.S. monetary conditions are positively associated with faster EM corporate leverage growth:

- A 1 percentage point decline in the U.S. policy rate corresponds to an increase in EM leverage growth of 9 basis points, on average, an appreciable increase given the sample average leverage growth of 35 basis points per year.

- Furthermore, this impact is more pronounced for firms with a relatively high intrinsic dependence on external financing. For instance, a decrease in the U.S. policy rate of one standard deviation is associated with leverage growth that is about 5 basis points greater for firms whose financial dependence is at the 75th percentile relative to firms whose financial dependence is at the 25th percentile. This difference is appreciable because incremental rises in leverage can build up over time, especially in the context of persistently loose global financial conditions. Likewise, relative to other types of firms, SMEs and/or firms with less collateral also disproportionately increase their leverage ratios amid accommodative U.S. monetary conditions.

- We also find that the impact of U.S. monetary policy conditions on EM leverage growth is greater for sectors that are more heavily dependent on external funding in financially open EMs with relatively more rigid exchange rate regimes.

These findings suggest that global financial conditions affect EM firms' leverage growth in part by influencing domestic interest rates and by relaxing corporate borrowing constraints.

[7] A battery of robustness checks is employed, including the use of different proxies for global financial conditions, various leverage measures, listed versus non-listed firm subsets, splits by level of country development (i.e., EMs vs AEs), and different metrics for financial constraints, among others.

This paper contributes to the literature along several dimensions. First, in contrast to Feyen et al.(2015), Gozzi et al.(2015), among others, who primarily focus on bond issuance, this paper considers *total* debt (which encompasses both bond- *and* bank-based debt, among others), thus providing a much more comprehensive picture of how EM corporate leverage growth is influenced by global financial conditions. Second, as opposed to much of the corporate finance literature that focuses on listed firms (predominantly in the United States), we consider SMEs and other private firms in addition to listed firms, to get a more comprehensive picture of corporate leverage dynamics. The importance of considering SMEs and other non-listed firms is emphasized by Kalemli-Ozcan, Sorensen, and Yesiltas (2012) who spotlight leverage dynamics across advanced economies. Third, and in the spirit of Frank and Goyal (2009), we uncover a new, quantitatively important, and reliable determinant of capital structure that is likely to be of relevance for any small, financially integrated emerging or advanced economy.[8] In addition, we highlight how the relationship between global financial conditions depends on sector- and country-specific features including dependence on external financing, financial openness, and exchange rate regime. Fourth, this paper provides novel empirical evidence that financial frictions play an important role in the transmission of monetary policy to the real economy, namely to non-financial corporate sector, across EMs.

We proceed as follows. The next section discusses the conceptual and empirical frameworks. Section III gives an overview of the data and variable definitions while relegating additional details to the Appendix. Section IV presents the main results of the paper, along with a very large array of robustness exercises, and Section V concludes.

II. METHODOLOGY

This section provides an overview of the conceptual and empirical frameworks that underpin the subsequent analysis.

[8] These results are consistent with the vast literature on capital flows. For example, global factors such as risk aversion and economic uncertainty are found to be associated with periods of extreme capital flows (Forbes and Warnock 2012). In the same vein, capital flow surges to EMs synchronize internationally and are driven by global push factors, including US interest rates and investor risk aversion (Ghosh et al., 2014).

A. Leverage Growth and Global Financial Conditions

In principle, global monetary conditions can influence EM leverage growth through several interrelated channels. Rather than providing a comprehensive survey, we provide an overview of the two broad channels that are most relevant for the empirical analysis. First, after Calvo, Leiderman, and Reinhart (1993, 1996), many other papers have documented that monetary policy loosening in advanced economies is characteristically accompanied by greater EM capital inflows. Likewise, more recent studies document a link between EM capital flows and global financial conditions—where U.S. monetary policy takes center stage—including Rey (2015), Miranda-Agrippino and Rey (2015), Fratzscher, Lo Duca, and Straub (2013) and Bruno and Shin (2015). During episodes of large capital inflows, if, for instance, EM central banks react by lowering policy rates more than they would otherwise to alleviate currency appreciation pressures, these lower rates would be transmitted to the real economy and foster corporate borrowing as it stimulates demand.

Second, accommodative global monetary conditions may promote leverage growth by relaxing borrowing constraints. Building on the work of Kiyotaki and Moore (1997), Bernanke, Gertler, Gilchrist (1999), and Iacoviello (2005), open-economy models developed by Gertler, Gilchrist, and Natalucci (2007), Elekdag and Tchakarov (2007) and Fernandez and Gulan (2015), among others, include financial frictions, which can take the form of borrowing constraints, thus prohibiting some firms from implementing their desired investment projects as they are not able to secure the needed funding. These frictions underpin a financial accelerator mechanism whereby the cost of debt, asset prices (including the exchange rate), and collateral valuation, jointly interact and determine the demand for capital and debt. If, for example, lower global interest rates push down domestic rates, this would raise the value of collateral, improve corporate financial positions, and therefore relax borrowing constraints. In turn, greater access to capital sets in motion a feedback loop where increased borrowing, leverage, investment, and output boost asset prices further, thereby further relaxing borrowing constraints. In sum, firms that are most dependent on external finance for their business operations, which would likely include SMEs and/or companies with limited collateral to pledge, stand to benefit the most from accommodative global financial conditions, and would therefore increase their leverage ratios disproportionately relative to other types of firms.

Accordingly, to find evidence that global financial conditions influence EM leverage growth by relaxing borrowing constraints, we use three proxies for these constraints. First, as our main proxy, we follow Rajan and Zingales (1998) and differentiate firms based on their intrinsic dependence on external financing. Second, in the spirit of Gertler and Gilchrist (1993), we argue that SMEs are more likely to face borrowing constraints. Third, as in Braun and Larrain (2005),

we use asset tangibility to capture the binding nature of borrowing constraints. In other words, we differentiate firms based either on their dependence on external finance, their availability of collateral, or their status as an SME.

B. Regression Specifications

To investigate the relationship between EM corporate leverage growth and global financial conditions, we start by estimating the following equation:

$$\Delta Leverage_{i,s,c,t} = \alpha * Monetary\ Conditions_t + \delta * Controls_{i,s,c,t-1} + \varepsilon_{i,s,c,t} \quad (1)$$

where *i*, *s*, *c*, and *t*, are indices of firms, sectors, countries, and time. Note that this is an annual panel regression, where firm-level leverage growth is regressed on, $Monetary\ Conditions_t$, firm-specific controls, which are lagged first differences (profitability, size, and tangibility), and macroeconomic conditions (the ICRG index) in some specifications. Furthermore, firm-specific fixed effects are included to account for unobserved firm-level factors (as are combinations of time, country-time, and sector-time fixed effects). In the baseline specifications, we report standard errors that are corrected for clustering by sector, although we consider other possibilities as well, such as two-way clustering (for example, by sector and time). The slope coefficient, α, measures the extent to which the monetary conditions affects EM leverage growth; given the sharp rise in the latter amid favorable global financial conditions, we expect $\alpha > 0$.

To identify the transmission of global financial conditions on corporate leverage more precisely, we differentiate firms based on their degree of financial constraints they face. Therefore, we introduce the interaction between the $Monetary\ Conditions_t$ and $Financial\ Constraints_s$ (which could, for example, include a measure of a sector's dependence on external financing in the spirit of Rajan and Zingales, 1998):

$$\Delta Leverage_{i,s,c,t} = \alpha * Monetary\ Conditions_t + \delta * Controls_{i,s,c,t-1} \quad (2)$$
$$+\beta * Monetary\ Conditions_t * Financial\ Constraints_s + \varepsilon_{i,s,c,t}$$

The slope coefficient on the interaction term, β, captures the extent to which the effect of monetary policy on leverage growth hinges on the nature of firms' financial constraints. We anticipate that favorable global financial conditions will matter more for financially constrained firms, that is $\beta > 0$.

Lastly, we investigate if the impact of global financial conditions on EM corporate leverage varies across countries by adding interaction terms between various country characteristics (such as, financial openness and exchange rate regime) and the inverted shadow rate. In other words, the equation above is augmented as follows:

$$\begin{aligned}\Delta Leverage_{i,s,c,t} = \alpha * Monetary\ Conditions_t + \delta * Controls_{i,s,c,t-1} \\ +\beta * Monetary\ Conditions_t * Financial\ Constraints_s \\ +\gamma * Monetary\ Conditions_t * Country\ Trait_{c,t} + \varepsilon_{i,s,c,t}\end{aligned} \quad (3)$$

where the slope coefficient on the additional interaction term, γ, then captures the degree to which the effect of shadow rate fluctuations depends on a particular country trait. While the sign of the coefficient on the last interaction term, γ, varies according to the specific country under consideration, we would expect that global financial conditions matter more for EMs that are more financially integrated (i.e., more open capital accounts) and for EMs that have less flexible exchange rate regimes.

III. Data and Variable Definitions

This section summarizes the main variables and data sources used in the analysis, with details relegated to the Appendix.

A. ORBIS

The firm-level dataset used is this paper is ORBIS (Bureau van Dijk Electronic Publishing, BvD), an annual global panel dataset for over 130 million public and private companies. Relative to other firm-level cross-country databases, a key advantage of ORBIS is its wider coverage of both listed and non-listed firms—which includes SMEs. Although ORBIS has the advantage of being more comprehensive with millions of firms represented in the database, more detailed information on financial statements (such as debt) is harder to come by in the context of EMs.[9] As explained in detail in the Appendix, our sample covers about 400,000 nonfinancial EM firms over 2004-2013, totaling more than 1.3 million firm-year observations.

[9] Likewise, ORBIS does not contain information on the foreign-currency positions, therefore we are not able to analyze risks owing to net foreign exchange exposures.

B. Measures of leverage

We consider alternative definitions, initially using the total (non-equity) liabilities-to-total asset ratio, TLTA, as our baseline measure of EM corporate leverage (consistent with, for example, Rajan and Zingales, 1995). This is the broadest definition of leverage, and as discussed in detail in the Appendix, circumvents the issue of missing debt data for certain firms (especially SMEs).[10] Furthermore, motivated by the clear upward trends in leverage documented in Figure 1, we focus on the growth (change) of EM corporate leverage, rather than its level. We appear to be in good company: De Angelo and Roll (2015) note that "capital structure stability is the exception, not the rule." Graham, Leary, and Roberts (2015) also consider growth of leverage, in the context of the U.S., a mature economy, thus motivating our focus on leverage growth in the context of faster growing EMs.

C. Global Financial Conditions and Shadow Rates

We initially proxy global financial conditions with measures of the U.S. monetary policy stance, but also account for unconventional monetary policies. In particular, we follow the literature on "shadow rates" which are complementary indicators of the monetary policy stance and can be especially useful once the policy rate has reached the zero lower bound.

D. Controls

As measure of a sector's intrinsic dependence on external finance, we use the financial dependence measure proposed by Rajan and Zingales (1998); at the firm level we control for size (log sales), profitability (return on assets), and asset tangibility (net property, plant, and equipment to total assets ratio). We also include a measure of overall macroeconomic conditions in certain regressions (see Appendix for details and discussions).

E. Descriptive Statistics

Table 1 reports summary statistics for selected variables. Financial dependence ranges from a low of –2.2 for the Tobacco and Cigarettes sectors, an industry that has been in decline over the last decades, to a high of 3.8 for the Electronic Repair and Related Services, an industry that has seen large growth.

[10] Studies have also singled out leverage ratios using long-term debt given that it has a closer link to investment. However, relative to total debt statistics, data on long-term debt is even more difficult to come by in ORBIS.

Estimated shadow rates reasonably reflect monetary policy events in unconventional policy regimes. We initially use the U.S. shadow rate estimated by Krippner (2014), which entered negative territory in November 2008, when the Federal Reserve started the Large Scale Asset Purchases program (Figure 2). The shadow rate further declined as the Fed adopted additional unconventional policies. However, it bottomed out in May 2013, when the Fed raised the possibility of tapering its purchases of Treasury and agency bonds, and has continued to increase since then. Likewise, the global shadow rate has been virtually flat in recent years, reflecting that the tighter stances in the United States and the United Kingdom have been offset by accommodative stances in Japan and the euro area (Figure 2).

In what follows, to facilitate the interpretation of the results, we use the *inverted* shadow rate (which is just the shadow rate multiplied by -1; this simple transformation is applied to other measures of monetary policy for consistency).

IV. EMPIRICAL RESULTS

After presenting the baseline results, this section discusses the implications of country-specific characteristics, and lastly, considers an array of sensitivity exercises to assess the robustness of the main findings.

A. Baseline Results

The baseline results are presented in Table 2. We include firm fixed effects throughout and, to start off with, cluster standard errors at the sector level. In Column 1, as a first pass, we examine the impact of changes in the inverted U.S. shadow rate on EM corporate leverage. We obtain a positive and statistically significant coefficient (0.088). This initial result suggests that expansionary global monetary conditions are associated with faster EM corporate leverage growth. In fact, an increase in the U.S. shadow rate (looser monetary conditions) of 1 percentage point corresponds to an increase in leverage growth of 9 basis points per year, which is not negligible relative to the sample average of 35 basis points (per year).[11]

[11] Although not the focus of the paper, some other findings are noteworthy: Regarding firm-level controls, we find that leverage growth is negatively related to sales growth (size), but positively related with changes in profitability and tangibility. The latter result is generally consistent with the literature: tangible assets are easier to value and tend to lower expected distress costs. The positive link between leverage and profitability growth likely reflects that more profitable firms typically have lower expected financial distress costs and therefore take on more debt. The inverted relationship between leverage and firm size is usually interpreted as being consistent with the pecking order theory (Frank and Goyal 2003). As for macroeconomic conditions, the results also indicate that leverage is procyclical: sounder country-level fundamentals co-vary positively with EM leverage growth, in line with, for example, the theoretical models of Kiyotaki and Moore (1997).

Column 2 introduces an interaction term between the corporate sector's varying dependence on external finance and the inverted U.S. shadow rate which is central to this paper.[12] Indeed, in contrast to other firms, we expect that firms in sectors that are more reliant on external finance to increase their leverage ratios faster amid favorable global financing conditions because of less binding borrowing constraints. The regression does not include the financial dependence variable on its own, as it is fully absorbed by the firm fixed effects terms.

We find that the impact of U.S. shadow rate fluctuations is statistically significantly higher for sectors that depend more on external finance. Based on the estimated coefficient in Column 2 (0.039), an increase in the *inverted* U.S. shadow rate of one standard deviation—corresponding to more accommodative monetary conditions—is associated with leverage growth that is about 5 basis points greater for firms whose financial dependence is at the 75th percentile (Chemicals and Pharmaceuticals) relative to firms whose financial dependence is at the 25th percentile (the Construction sector). This is a notable effect compared to the sample average growth rate of 35 basis points per year. Considering the protracted nature of the exceptionally loose global financial conditions, it is clear how even seemingly incremental increases in leverage can build up over time.

In Column 3, we include dummies for each year to control of other contemporaneous time effects. The inverted shadow rate is now fully captured by these dummies (time fixed effects terms), and is therefore dropped from this specification. The interaction term of interest, $Monetary\ Conditions_t * Financial\ Constraints_s$, is again statistically significant at the 1 percent level, with an estimated coefficient value of 0.038, which is only marginally lower than in the regression without time dummies.

In Column 4, we include dummies for country-time pairs. These terms absorb the country-specific control, and therefore the control for country-specific macroeconomic conditions is omitted from the regression. Again, the interaction term is still highly statistically significant, and in line with the other coefficient estimates.

Finally, in Column 5, we also add dummies for sector-time pairs (in addition to the country-time fixed effects terms). These terms control for unobserved factors that vary over time for each

[12] Recall such differentiation sharpens identification because it is more likely that global financial conditions would disproportionately affect firms based on their varying dependence on external financing rather than, for instance, global growth or commodity prices fluctuations. Note also that our international setting further refines identification because it is rather unlikely that global monetary conditions are influenced by developments in any individual EM firm.

sector. Not surprisingly, the coefficient associated with the interaction term declines, to 0.017, but is still statistically significant at the 5 percent level. The lower slope estimate most likely reflects the correlations between the interaction term, and the country-time and sector-time dummies.

In sum, these results support our first two hypotheses: (1) we find that accommodative U.S. monetary conditions are reliably associated with faster EM corporate leverage growth, and (2) this impact more pronounced for sectors that relatively more in need of external financing.

B. Country Traits

We now investigate whether and how the impact of the U.S. monetary conditions varies across countries. In Table 3, firm and time fixed effects terms are included in the regressions.

In Column I, we consider the implications of financial development by adding a proxy for domestic financial development and its interaction with the inverted U.S. shadow rate. Many other studies, beginning with King and Levine (1993), have shown that financial development boosts economic growth by relaxing financial constraints. Following this literature, we initially measure domestic financial development with domestic credit to the private sector scaled by GDP.

The interaction term of domestic financial development and the inverted U.S. shadow rate is negative and statistically significant. This finding suggests that more financially developed countries are less sensitive to global financing conditions in part because they benefit from greater domestic funding opportunities.[13] This finding is corroborated if we use the financial development index of Sahay et al.(2015) as shown under Column II.

In Columns III and IV we consider the role of capital account openness. We find that in countries that have more open capital accounts (that is countries that are more financially open) firms' leverage growth tends to be more responsive to U.S. monetary conditions. This result holds up when we control for exchange rate regimes and the degree of policy rate synchronization between the U.S. and individuals EMs.[14]

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[13] The measure of capital account openness is based on Chinn and Ito (2006).

[14] For the former, we use the exchange rate regime classification proposed by Reinhart and Rogoff (2004). To facilitate interpretation, we invert the series such that a *lower* value denotes *greater* exchange rate flexibility. For the latter, we follow

This last finding hints at an important channel that may be at work: U.S. monetary conditions may affect EM firms' leverage growth through domestic interest rates. Given a completely liberalized capital account, theory suggests that when a country adopts a fixed exchange rate regime, it must forgo monetary autonomy; that is, its own interest rate must change in response to foreign monetary conditions. Moreover, even countries with flexible exchange rates in practice may choose to use monetary policy to dampen, though not fully prevent, currency fluctuations arising from changing external financial conditions.[15] Therefore, we test whether U.S. monetary conditions have stronger effects in countries with more open capital accounts and with less flexible exchange rates, where domestic interest rates have to accommodate exchange rate policy.[16]

The results are shown in Table 4. Under Columns 1 and 2, using the sample median, countries are split into two groups: those with relatively more open and more closed capital accounts. Similarly, using the median, in Columns 3 and 4, we split the sample into two groups: those with relatively more rigid and more flexible exchange rate regimes. Lastly, under Columns 5 and 6, we compare EMs with less open capital accounts and more flexible exchange rate regimes with EMs that are more financially open and maintain more rigid exchange rate regimes.

The results in Columns 5 and 6 are of most interest. In particular, we find that the coefficient on interaction term, $Monetary\ Conditions_t * Financial\ Dependence_s$, under Column 6 is estimated to be 0.072, and is statistically significant at the 1 percent level, while the coefficient under Column 5 is statistically not different from zero. Thus, in financially open EMs with more rigid exchange rate regimes, the impact of U.S. monetary policy conditions is more pronounced for sectors that depend more on external finance. In sum, these results lend support to the relevance of the monetary policy transmission channel whereby U.S. monetary conditions influence domestic policy rates, especially in countries with open capital account and with less flexible exchange rates.

Laeven and Tong (2012), and measure monetary policy synchronization by taking the correlation of monthly money market rates between the U.S. and each EM over our sample.

[15] Rey (2015) argues that the classic trilemma reduces to an "irreconcilable duo" of monetary independence and capital mobility. Consequently, restricting capital-mobility may be the only way for small open economies to retain monetary autonomy. In contrast, Obstfeld (2015) argues that the trilemma remains valid, but that financial integration worsens trade-offs monetary policy faces when navigating multiple objectives.

[16] More rigid exchange rate regimes are typically pegged to the dollar or to a basket where the dollar has a very large share.

C. Robustness

This section summarizes an extensive set of sensitivity exercises. Alternative measures of monetary conditions, financial constraints, firm-specific characteristics, and leverage ratios are the variables considered in the empirical exercises discussed below. Overall, this section highlights the robustness of our baseline empirical setup and findings.

Monetary conditions

Thus far we have used a measure of the U.S. monetary policy stance as a proxy for global financial conditions. We now consider three complementary measures: First, we use the (inverted) global shadow rate in place of the U.S. shadow rate. Recall that the global shadow rate captures the common dynamics of the shadow rates across the major central banks (that is, the Bank of England, Bank of Japan, European Central Bank, and the Federal Reserve). Relative to the U.S. shadow rate, arguably, the global shadow rate is an even more exogenous measure of global financial conditions. In Table 5, the (inverted) U.S. shadow rate is replaced with its global counterpart. We find similar results: the global shadow rate is positively and statistically significantly correlated with EM leverage growth.[17]

Second, we consider the Federal fund rate, as well as various Treasury rates. These are more common measures of the U.S. monetary policy stance. Interestingly, although constrained by the zero lower bound, the (inverted) Federal fund rate has the expected sign and is statistically significant at the one percent level (Table 6). Note however, that the coefficient estimate (0.028) is lower than when the shadow rate is used (0.038) most likely reflecting the Federal fund rate does not account for the unconventional policy measures (such as large-scale asset purchases). Treasury rates are various maturities are also presented, and further reinforce the baseline results.

Third, we use a measure of U.S. monetary policy shocks in place of the shadow rate. The data is based on Gertler and Karadi (2015).[18] This measure is advantageous because it abstracts from

[17] Although not reported, we also repeat these exercises using lagged U.S. and global shadow rates and obtain very similar results as well—these results available upon request.

[18] We thank Peter Karadi for sharing an updated version of the shocks. For consistency, we again multiply these shocks by -1 so that a positive shock corresponds to a looser monetary stance. The shocks based on the one-year ahead futures on 3-month Eurodollar deposits were the most reliable in the context of this paper. Note that the Gertler-Karadi shocks, as other measures in the literature, are available at the monthly frequency. However, we have an annual panel dataset, and frequency conversion is not trivial. As the Gertler-Karadi estimates are shocks, it would not be surprising to find that the average (or sum) within each year is virtually zero. Therefore, to be able to capture the variation inherent in the shocks, we take the maximum (minimum) monthly value when the shock is positive (negative) in a given year as the annual measure of the shock in this final robustness check.

monetary policy actions that were already anticipated by the market, and like the shadow rate, it allows for the inclusion of the recent period when U.S. short-term rates are close to the zero lower bound (see also Debola, Rivolta, Stracca 2015). Using such a measure strengthens our case of treating U.S. monetary conditions as exogenous, since U.S. monetary policy is unlikely to be affected in a systematic way by idiosyncratic EM shocks.[19] As shown in Table 7, the results once again reinforce the previous findings: there is a positive and statistically significant relationship between the U.S. monetary shocks and EM leverage growth. As we are now considering shocks, it is not surprising that the estimated coefficients are somewhat lower than those reported Table 2. It is also worthy to note that this last set of results takes an international perspective on the transmission channel of U.S. monetary policy, as we shed light on the role of U.S. monetary policy in influencing EM corporate leverage.

We also consider the role of the VIX index, which has been used as an alternative and/or complementary measure of global financial conditions (see papers cited above, including, for example, Rey, 2015). Along with the baseline specifications, Table 8 presents that results when the inverted shadow rate is replaced with the inverted of the VIX (again, to facilitate interpretation). As is clear, the results are in line with our main findings and reaffirm the positive, statistically significant, and robust relationship between global financial conditions and EM leverage growth.

Table 9 includes global growth and oil prices (which were previously accounted for by time fixed effects terms). The results are intuitive. For example, global oil prices and EM leverage appear to move in tandem. Indeed, IMF (2015a) notes that amid elevated commodity prices, energy firms have issued a significant share of nonfinancial EM corporate bonds. More importantly, the coefficients on the shadow rates are essentially unaltered when these alternative global factors are introduced.

Small- and medium-sized enterprises

Our initial measure of financial frictions was based on firms' dependence on external financing. A complementary measure of financial frictions is to categorize firms is by their size. As discussed in, for example, Gertler and Gilchrist (1993), firm size is a reasonable indicator of capital market access, there being a strong correlation between size and access to external

[19] Unless the shocks are global in nature and monetary authorities around the global respond similarly to such shocks.

finance. Specifically, SMEs on average rely heavily on intermediary credit, whereas large firms make far greater use of equity, longer-term debt, and commercial paper. In other words, SMEs have a greater tendency to face borrowing constraints.[20] Therefore we construct a dummy variable that takes a value of unity if a firm is an SME.[21] The results shown in Table 10 indicate that (1) there is a positive relationship between SME leverage growth and the U.S. shadow rate, and (2) SME leverage growth increases disproportionately amid looser U.S. monetary conditions.

Asset tangibility

Asset tangibility is a complementary way to gauge the binding nature of borrowing constraints. As discussed in Braun and Larrain (2005), in an environment with incomplete financial contractibility, having assets that can be easily transferred to investors improves a firms' access to external funding. As in the literature, we construct a tangible assets ratio by scaling "hard" assets such as (net) property, plant, and equipment by total assets. Because a firm-level measure of asset tangibility is already included, for the interaction terms we create a dummy variable that takes a value of one for firms in the bottom tertile of the distribution in terms of their tangible assets ratios. As in the previous exercises discussed thus far, this new ratio is interacted with the shadow rate. Evidence in Table 11 echoes the results discussed thus far. Briefly, firms with a lower share of tangible assets tend to disproportionately increase their leverage ratios when U.S. monetary conditions are loose. Table 12 considers a triple interaction term, and the main takeaway is that SMEs with less tangible assets to pledge as collateral (presumably these firms that face the most binding borrowing constraints) show an even greater tendency to increase their leverage ratios when global financial conditions are favorable.[22]

Standard errors

To further assess robustness, we consider alternative ways to cluster the standard errors. In the baseline we clustered by sector. In Table 13, we cluster by sector *and* time, and the coefficient on

[20] See, for example, studies beginning with Fazzari, Hubbard, and Peterson (1988).

[21] SMEs are firms with operating revenues, total assets, and employees below €10 ($13) million, €20 ($26) million, and 150, respectively.

[22] Other robustness exercises where also conducted, and show, for example, that the triple interaction between the inverted shadow rate, the SME dummy, and the cash conversion cycle (a measure of financial constraints focusing on the need for liquidity; see Raddatz 2006) is also positive and statistically significant.

the interaction term, for example, remains statistically significant. Table 14 summarizes several other ways to cluster standards errors. Again, the main coefficient of interest is statistically significant.[23]

Firm fundamentals

While not the main focus of the paper, we now consider other firm-specific fundamentals. Although we find sales, profitability, and tangibility to be quite robust across an array of specifications—in line with Rajan and Zingales (1995), for example—other studies, such as Frank and Goyal (2009), use total assets as a proxy for size and also include median industry leverage as firm-specific controls. To this end, in Table 15 we consider combinations that replace sale with assets and/or include median firm leverage. In these specifications, the interaction of the inverted shadow rate and financial dependence again remains statistically significant.

Leverage ratios

We also consider alternative leverage ratios (Table 16). These ratios were described above, and the interaction term, $Monetary\ Conditions_t * Financial\ Depdendence_s$, remains statistically significant when it is considered in turn in place of the total liabilities-to-total assets ratio used in the baseline specification.

Sectors and countries

To gauge whether a particular sector or country might be driving the results, we conduct two related exercises. We re-estimate the baseline regression, but exclude each sector one by one, and do the same for each country in our sample. Although not reported (results available upon request), the baseline specification is extremely robust to the exclusion of individual countries, including large ones such as China. Indeed, the interaction between the shadow rate and financial dependence, for example, remain statistically significant at the 1 percent level. Exclusion of individual sectors presents a similar picture. The general contractors (construction) sector is the only sector for which exclusion from the regression lowers statistical significance.

[23] Although not reported, the results remain statistically significant when Driscoll-Kraay standard errors are used (results available upon request). This said, Driscoll-Kraay standard errors are generally more appropriate for panels with a longer time dimensions.

Listed Firms and Extended Time Span

In the last robustness exercise, listed firms from both emerging markets and advanced economies are considered (Appendix Table 3).[24] The analysis with listed firms has the advantage that it spans over a 20-year period, from 1995 to 2014. Although the set of listed firms is much narrower (about 40,000), it allows us to consider 51 countries in total, 18 EMs and 33AEs. In addition, another measure of leverage is considered in this exercise, namely the total debt-to-total assets is used instead of total liabilities-to-total assts. Total debt refers only financial liabilities. However, this measure is not available in Orbis for all major EMs, in particular for Chinese firms. The results from this analysis show comparatively similar magnitude and significance with those obtained with both listed and non-listed firm data from Orbis in our baseline specification (Table 2). Finally, we can confirm the analysis for AE firms (columns 4-6), where results are broadly similar to those when EM firms are considered (columns 1-3). However, the interaction coefficient for AE firms is half the magnitude in EMs, pointing to the fact that borrowing constraints for EM firms were relaxed more than in AEs.

V. CONCLUSIONS

This paper is motivated by sharp rise in emerging market corporate debt in recent years when global financial conditions were exceptionally accommodative. Accordingly, it investigates if there is a reliable relationship between firms' leverage growth in EMs and global financial conditions—initially proxied using a measure of U.S. monetary conditions. The results suggest an economically meaningful and statistically robust relationship whereby accommodative U.S. monetary conditions are associated with faster EM corporate leverage growth. Moreover, this effect is more pronounced for sectors that depend more on external financing, for SMEs, and for more financially open EMs with less flexible exchange rate regimes. These findings suggest that U.S. monetary conditions affect EM firms' leverage growth in part by influencing domestic interest rates and by relaxing corporate borrowing constraints.

To our knowledge, this is the first paper to demonstrate that global financial conditions are a reliable determinant of firm-level leverage dynamics. The focus is on EMs; however, this result

[24] These firm-level data are obtained from Worldscope database and filtered to countries with more than 100 firms. A summary comparison of the firm, country and time coverage among Orbis and WorldScope datasets is presented in Appendix Table 2.

is likely to be relevant for advanced small open economies as well. The greater role of global factors during a period when they have been exceptionally favorable indicates that EMs must prepare for the implications of a potential tightening of global financial conditions.[25]

A potential area for future research is to explore the role of institutional environments, particularly corporate governance, in explaining firm capital structure and leverage dynamics. This topic could be relevant especially in the context of EMs where comprehensive cross-country empirical evidence is relatively scarce. Indeed, country- and firm-level heterogeneity in corporate governance structures could shed light on differential sensitivities to global financial conditions.

[25] See IMF (2015b) for further details.

APPENDIX I. ORBIS

This appendix provides further details on the data and variables used in the analysis.

ORBIS

The firm-level dataset used is this paper is ORBIS (Bureau van Dijk Electronic Publishing, BvD), an annual global panel dataset for over 130 million public and private (non-listed) companies. A notable advantage of ORBIS is that it includes non-listed firms, such as SMEs. Data on firms' financial positions and productive activities is sourced from their balance sheets and income statements. Because ORBIS includes non-listed firms, by construction, all available data is based on book values. Although ORBIS has the advantage of being more comprehensive with millions of firms represented in the database, more detailed information on financial statements is harder to come by in the context of EMs. For example, debt is not reported by many EM firms.[26]

As with other large micro data sets, the data need to be managed carefully before they can be used for formal econometric analysis. Kalemli-Ozcan et al.(2015) discuss challenges of the ORBIS data base and methods to overcome them. Accordingly, when cleaning ORBIS for our purposes, we are guided by the methods laid out in Kalemli-Ozcan et al.(2015), Kalemli-Ozcan, Laeven, and Moreno (2015), Kalemli-Ozcan, Sorensen, and Yesiltas (2012), Fons-Rosen et al.(2013), and for instance, Gopinath et al.(2015). For instance, to avoid double counting and to improve comparability across countries consolidated accounts are considered. We focus on private EM non-financial corporations with total assets in excess of $1 million. As a result, about 60 percent our sample covers SMEs. Finally, all variables are winsorized at 2.5 percent to account for outliers, especially owing to input errors.[27] The ORBIS-based firm-level dataset is then merged with a country-specific measure of macroeconomic conditions (ICRG index) and global factors (for example, a measure of the U.S. monetary policy stance, both which are discussed below. In sum, the dataset comprises over 400,000 firms for 24 EMs during 2004-

[26] Likewise, ORBIS does not contain information on the foreign-currency positions, therefore we are not able to analyze risks owing to net foreign exchange exposures, for example.

[27] Some additional details are as follows: All companies categorized as "Public authority/State/Government" are excluded from our sample. We drop company-years observations with missing information on total assets, total shareholder funds, total liabilities, and sector. We drop also company-year observations with negative total assets, cash holdings, total equity, total fixed assets, current assets, current liabilities, total liabilities, loans, or depreciation and amortization. Moreover, several accounting checks were considered. For example, if the sum of fixed assets and current assets exceeds total assets (by a notable margin) those observations are dropped. Another accounting relationship was to check whether the sum of non-current liabilities, current liabilities, and total equity exceeds total liabilities and shareholder funds.

2013, resulting in an unbalanced panel comprising nearly 1.3 million firm-year observations (Appendix Table 1).

Measures of Leverage

Leverage, or financial leverage, is the degree to which a company uses fixed-income securities such as debt. A high degree of financial leverage entails larger interest payments, which negatively affect firm's profitability. Leverage is usually presented as a ratio, such as debt to assets. The broadest definitions of leverage consider total non-equity liabilities. An advantage of using total liabilities is that it implicitly recognizes that some firms can use trade credit as a means of financing, rather than purely for transactions (Rajan and Zingales, 1995). Another benefit of using total liabilities is its availability. In contrast, for some countries, debt may not be reported in larger datasets that include non-listed firms, which is the reality we face when using ORBIS.

For these reasons, we initially consider the total (non-equity) liabilities-to-total asset ratio, TLTA, as our measure of EM corporate leverage (consistent with, for example, Rajan and Zingales, 1995). Later, we also consider alternative definitions of leverage including the total liabilities-to-total equity, total assets-to-total equity ratios, and total debt-to-total-assets ratio (TDTA) for the Worldscope data. Furthermore, to account for the fact that leverage may have risen owing to the accumulation of precautionary cash buffers, we consider variations of these ratios where cash is netted out.[28]

Financial dependence index

As measure of a sector's intrinsic dependence on external finance, we use the financial dependence measure proposed by Rajan and Zingales (1998). Conceptually, the Rajan and Zingales index aims to identify sectors that are naturally more dependent on external financing for their business operation. They compute a sector's dependence on external finance as:

$$Financial\ Dependence = (Capital\ Expenditures - Cash\ Flow)/Capital\ Expenditures$$

[28] Studies have also singled out leverage ratios using long-term debt given that it has a closer link to investment. However, relative to total debt statistics, data on long-term debt is even more difficult to come by in ORBIS.

where cash flow = cash flow from operations + decreases in inventories + decreases in receivables + increases in payables. The index is computed using data on publicly listed US firms, which are judged to be least likely to suffer from financing constraints relative to generally smaller firms in other countries, including EMs. We use an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011) over 1990-2006, which allows us to consider over 50 sectors.[29]

Firm-level controls

Building on the literature (for example, Rajan and Zingales, 1995) and based on data availability, size (log sales), profitability (return on assets), and asset tangibility (net property, plant, and equipment to total assets ratio) are firm-level controls used in the baseline specification. As noted by Frank and Goyal (2009), the expected signs of these controls are ambiguous based on opposing theoretical predictions.[30]

***Leverage and profitability*:** Profitable firms face lower expected costs of financial distress (and find interest tax shields more valuable), and therefore the tax and bankruptcy costs perspective predicts that profitable firms taken on more debt.[31] Moreover, the agency costs perspective predicts that the discipline provided by debt is more valuable for profitable firms with more acute free cash flow problems (Jensen, 1986). In contrast, the pecking order theory argues that firms prefer internal finance over external funds, implying that profitability and leverage are negatively correlated.

Leverage and size: Large, and potentially more diversified, firms face lower default risk. Therefore, the trade-off theory predicts larger firms to have relatively more debt. Conversely, the pecking order theory is usually interpreted as implying an inverted relationship between leverage and firm size (Frank and Goyal, 2009).

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[29] We thank Hui Tong for sharing their data. For details, please see Tong and Wei (2011). Below we conduct robust exercises to make sure that any single sector does not drive our findings. We also consider a complementary measure of financial frictions and categorize firms is by their size as discussed below.

[30] Departures from the Modigliani-Miller (1958) irrelevance proposition regarding firm capital structure can be categorized into three broad alternative theories: The first is the trade-off theory in which firms issue debt until the benefits (tax incentives) and costs (bankruptcy) of debt are balanced (the "tax-bankruptcy trade-off"). The second is the pecking order theory (Myers and Majluf 1984), which governs the order of financing sources: firms prefer to finance themselves first by using internal funds, then by issuing debt, and, as a last resort, by issuing equity. The third is the market timing theory, in which managers are more likely to tap markets with the most favorable conditions.

[31] If capital expenditures and dividend payouts are fixed, then more profitable firms will become less levered over time.

Leverage and asset tangibility: Tangible assets, such as property, plant, and equipment, are easier for outsiders to value than intangibles, such as goodwill. Therefore, a greater share of tangible assets relative to total assets lowers expected distress costs, and therefore suggests a positive relationship between tangibility and leverage.[32] The pecking order theory makes the opposite prediction. Low information asymmetry associated with tangible assets makes equity issuance less costly, and therefore leverage ratios should be lower for firms with a greater share of tangible assets.[33]

Country-specific controls

In some specifications, we explicitly attempt to account for country-specific macroeconomic conditions. In particular, we follow Bekaert et al.(2014), and take the average of the International Country Risk Guide (ICRG) Economic and Financial Risk Ratings. The ICRG economic risk indicator is designed to capture a country's current economic strengths and weaknesses. It combines information on five economic statistics: GDP levels, GDP growth, inflation, government budgets, and the current account. The ICRG financial risk indicator is designed to assess a country's ability to finance its official, commercial, and trade debt obligations. It combines data from five statistics: foreign debt as a percentage of either GDP or exports, the current account as a percentage of exports, official reserves, and exchange rate stability. In both cases, a higher value indicates stronger fundamentals.[34] Recall that various theoretical studies have differing predictions regarding the cyclicality of leverage, further motivating our empirical analysis. Although we use the ICRG to control for country-specific macroeconomic conditions, we also consider regressions that include country-time fixed effects, thereby controlling for a wider array of factors that may be affecting firm-level leverage depending on their location and period in question.[35]

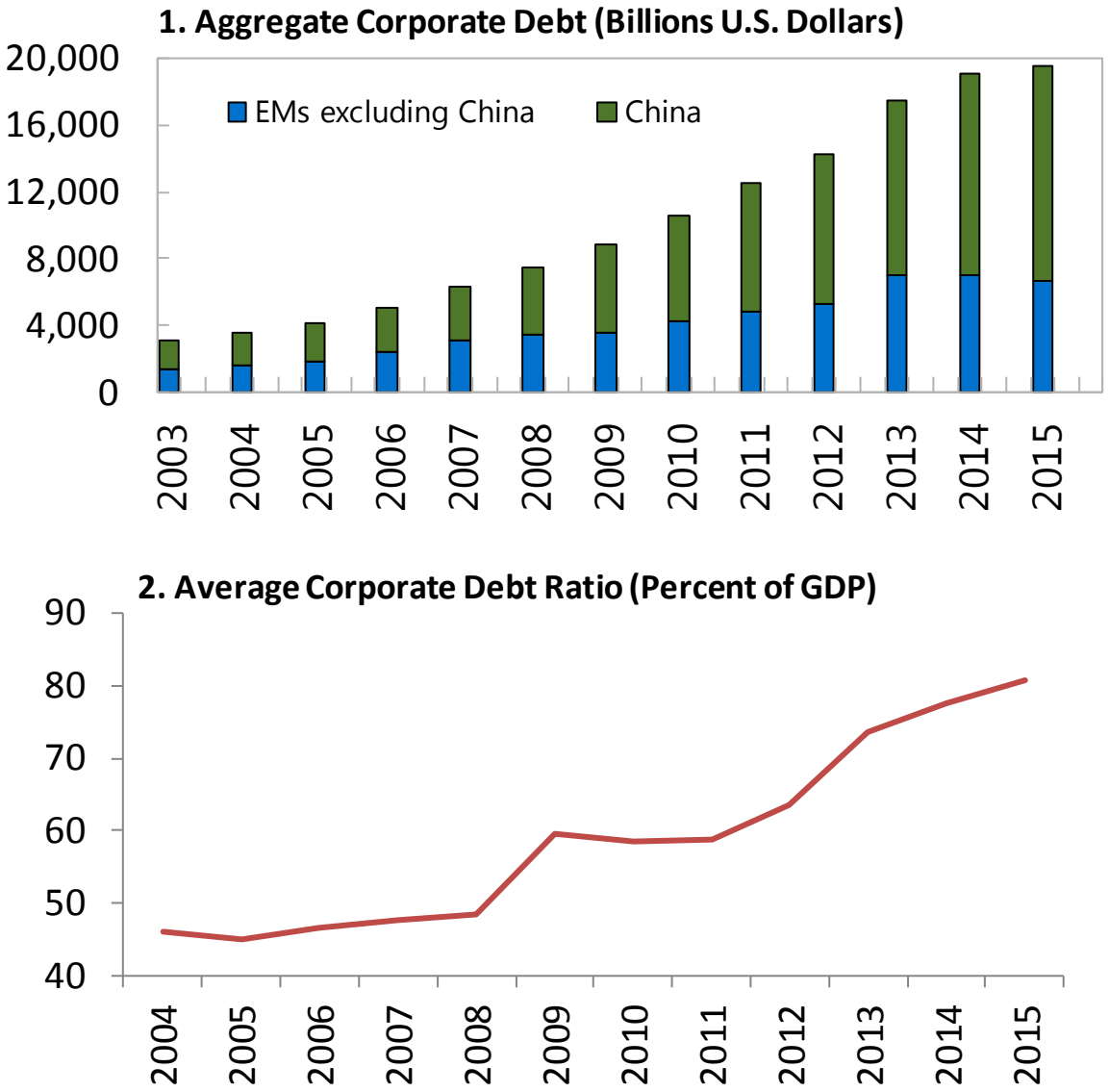
[32] Furthermore, tangibility makes it difficult for shareholders to substitute high-risk assets for low-risk ones, and few debt-related agency problems also predict that leverage and tangibility are positively correlated.

[33] However, as noted in Frank and Goyal (2009), if adverse selection is about assets in place, tangibility increase adverse selection and results in higher debt (and we are back to a prediction that tangibility and leverage are positively related). This ambiguity under the pecking order theory reflects the fact that tangibility can be used as a proxy for different economic factors. Likewise, as note by Berger, Ofek, and Yermack (1997), for example, amid agency problems, the relationship between corporate governance and leverage is also ambiguous.

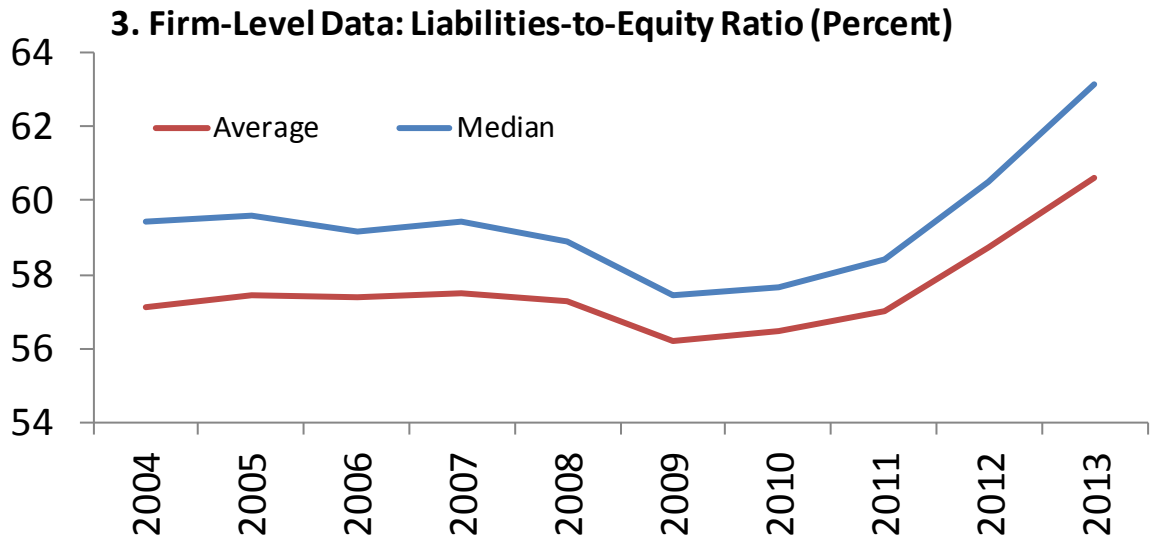
[34] For further details: https://www.prsgroup.com/about-us/our-two-methodologies/icrg.

[35] We also include various global controls in some specifications. In particular, we include oil prices to account for the large increase in leverage, induced by bond issuance for instance, by EM firms in the oil and gas sector (IMF 2015b). Global growth is

Figure 1. Emerging Markets: Aggregate and Firm-Level Measures of Corporate Leverage



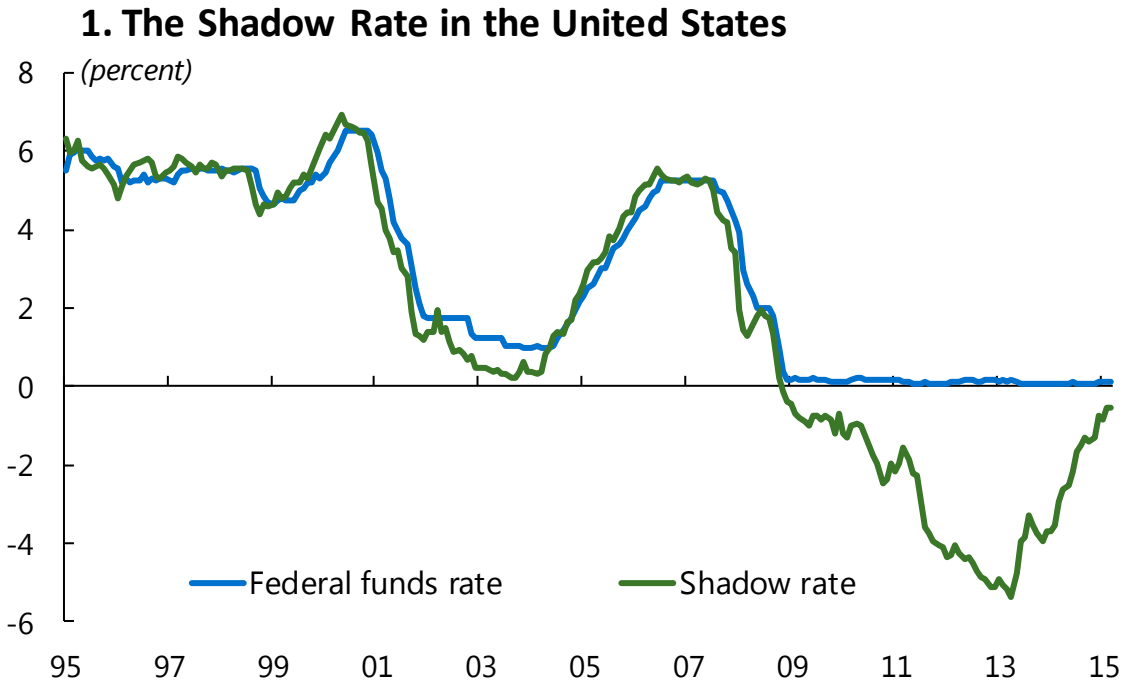
another control considered. This said, regressions are presented which include time fixed effects which take into account oil prices and other factors that might influence leverage growth across EM firms.

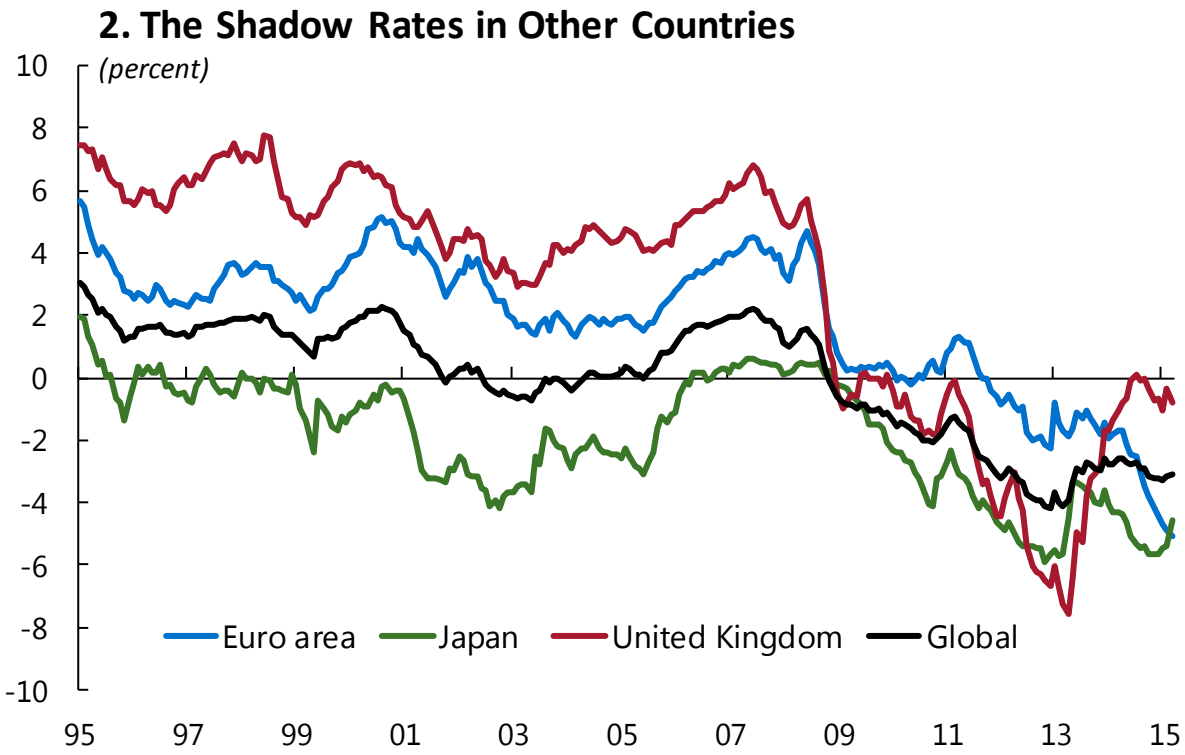


Sources: Bank for International Settlements; Dealogic; IMF; Orbis; and authors' calculations.

Note: The selected emerging markets are presented in Appendix Table 1.

Figure 2. The Shadow Rates





Sources: Reserve Bank of New Zealand home page; and authors' calculations.
Note: The global shadow rate is the first principal component of the shadow rates of the four central banks (Bank of England, Bank of Japan, European Central Bank, and U.S. Federal Reserve).

Table 1. Summary Statistics: Key Variables

Key variables	Observations	Mean	Median	Standard deviation	First quartile	Third quartile	Minimum	Maximum
Leverage	3,996,138	0.58	0.59	0.30	0.34	0.81	0.01	1.41
Sales	3,210,832	15.43	15.41	1.47	14.56	16.35	10.53	19.38
Profitability	3,902,401	0.08	0.03	0.16	0.00	0.11	-0.28	0.85
Tangibility	3,675,210	0.32	0.27	0.27	0.08	0.51	0.00	0.97
Financial dependence	56	0.14	0.06	0.67	-0.08	0.30	-2.19	3.84
Macroeconomic conditions	196	40.50	42.48	4.46	36.88	44.17	27.69	45.71
Inverse U.S. shadow rate	10	0.48	0.80	3.35	-1.23	2.87	-5.23	4.58

Sources: Orbis database; Reserve Bank of New Zealand; PRS Group; Authors' calculations.

Note: Leverage is the ratio of Total non-equity liabilities to Total assets. Sales is the logarithmic transformation of total sales. Profitability is Return-on-assets. Tangibility is defined as Net property, plant, and equipment to Total assets. Financial dependence is the updated version of the original Rajan-Zingales (1998) index based on Tong and Wei (2011). Macroeconomic conditions are proxied by the ICRG economic and financial index. The (inverted) shadow rate is estimated from a term-structure model based on Krippner (2014).

Table 2. Baseline: EM Corporate Leverage and Global Financial Conditions

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.651***	-1.697***	-1.747***	-1.821***	-1.813***
	(0.123)	(0.120)	(0.121)	(0.121)	(0.122)
Profitability	0.107***	0.103***	0.105***	0.107***	0.108***
	(0.00549)	(0.00471)	(0.00469)	(0.00513)	(0.00513)
Tangibility	0.0764***	0.0773***	0.0784***	0.0780***	0.0782***
	(0.00297)	(0.00306)	(0.00312)	(0.00313)	(0.00315)
Macroeconomic conditions	0.197***	0.188***	0.132***		
	(0.0147)	(0.0147)	(0.0148)		
Inverted shadow rate	0.0879***	0.0794***			
	(0.0122)	(0.00941)			
Inverted shadow rate x		0.0386***	0.0376***	0.0329***	0.0174**
Financial dependence		(0.0108)	(0.00972)	(0.00928)	(0.00727)
Observations	1,424,409	1,363,751	1,363,751	1,363,844	1,363,844
R-squared (within)	0.010	0.010	0.011	0.014	0.015
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 3. Leverage, Global Financial Conditions, and Country Traits

Leverage	(1)	(2)	(3)	(4)
Sales	-1.361***	-1.413***	-1.399***	-1.408***
	(0.122)	(0.125)	(0.126)	(0.124)
Profitability	2.290***	2.243***	2.342***	2.233***
	(0.279)	(0.281)	(0.286)	(0.280)
Tangibility	0.0764***	0.0761***	0.0761***	0.0760***
	(0.00333)	(0.00346)	(0.00330)	(0.00346)
Macroeconomic conditions	0.121***	0.117***	0.114***	0.136***
	(0.0151)	(0.0170)	(0.0169)	(0.0169)
Inverted shadow rate (ISR) x	0.0230***	0.0236***	0.0311***	0.0242***
Financial dependence	(0.00725)	(0.00682)	(0.00832)	(0.00680)
Credit-to-GDP	0.0204***			
	(0.00476)			
Credit-to-GDP x ISR	-0.000763***			
	(0.000229)			
Financial development index (FDI)		0.0661***		
		(0.00981)		
FDI x ISR		-0.00157***		
		(0.000542)		
Per capita income (PCI)			2.825***	
			(0.405)	
PCI x ISR			-0.0197	
			(0.0185)	
Capital account openness (KAO)				-0.285
				(0.376)
KAO x ISR				0.0969***
				(0.0186)
Observations	1,352,180	1,328,563	1,361,768	1,328,563
R-squared (within)	0.008	0.008	0.008	0.008
Fixed effects				
Firm	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial development index summarizes country-level information regarding financial institutions and markets based on Sahay et al.(2015). Capital account openness is an index based on Chinn and Ito (2006). Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 4. Leverage, Global Financial Conditions, Financial Openness, and Exchange Rate Regimes

Leverage	(1)	(2)	(3)	(4)	(5)	(6)
Relative capital account openness	Less open	More open			Less open	More open
Relative exchange rate flexibility			More flexible	Less flexible	More flexible	Less flexible
Sales	-0.687***	-1.952***	-2.026***	-0.868***	-1.791***	-1.256***
	(0.0974)	(0.127)	(0.129)	(0.0851)	(0.172)	(0.140)
Profitability	1.775***	2.779***	3.018***	2.413***	4.723***	1.041*
	(0.317)	(0.428)	(0.429)	(0.409)	(0.881)	(0.608)
Tangibility	0.0733***	0.0794***	0.0758***	0.0800***	0.0428***	0.0745***
	(0.00383)	(0.00459)	(0.00478)	(0.00402)	(0.0107)	(0.00752)
Macroeconomic conditions	0.249***	-0.0278	-0.189***	0.159***	-1.647***	0.141***
	(0.0376)	(0.0208)	(0.0329)	(0.0212)	(0.273)	(0.0190)
Inverted shadow rate x	0.0216**	0.0300***	0.0159*	0.0672***	0.00383	0.0716***
Financial dependence	(0.0103)	(0.00735)	(0.00881)	(0.0121)	(0.0264)	(0.0129)
Observations	635,988	725,780	833,340	528,428	211,589	104,029
R-squared (within)	0.004	0.013	0.013	0.007	0.015	0.016
Fixed effects						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Capital account openness is an index based on Chinn and Ito (2006). Exchange rate flexibility is a de facto exchange rate regime classification based on Ilzetzki, Reinhart, and Rogoff (2008). Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 5. Robustness: Global Shadow Rate

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.650***	-1.695***	-1.747***	-1.821***	-1.814***
	(0.124)	(0.122)	(0.121)	(0.121)	(0.122)
Profitability	0.107***	0.104***	0.105***	0.107***	0.108***
	(0.00540)	(0.00475)	(0.00470)	(0.00513)	(0.00513)
Tangibility	0.0767***	0.0777***	0.0784***	0.0780***	0.0782***
	(0.00301)	(0.00310)	(0.00312)	(0.00313)	(0.00315)
Macroeconomic conditions	0.197***	0.190***	0.132***		
	(0.0144)	(0.0147)	(0.0148)		
Inverted shadow rate	0.322***	0.300***			
	(0.0395)	(0.0300)			
Inverted global shadow rate x		0.134***	0.134***	0.109***	0.0579***
Financial dependence		(0.0337)	(0.0329)	(0.0271)	(0.0211)
Observations	1,424,409	1,363,751	1,363,751	1,363,844	1,363,844
R-squared (within)	0.010	0.010	0.011	0.014	0.015
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) global shadow rate is the principal component of the shadow rates in euro area, Japan, and United States based on Krippner (2014). Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 6. Robustness: U.S. Policy Rates

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.747***	-1.748***	-1.748***	-1.749***	-1.750***
	(0.121)	(0.121)	(0.121)	(0.122)	(0.122)
Profitability	0.105***	0.104***	0.104***	0.105***	0.104***
	(0.00469)	(0.00466)	(0.00466)	(0.00467)	(0.00465)
Tangibility	0.0784***	0.0784***	0.0784***	0.0784***	0.0784***
	(0.00312)	(0.00310)	(0.00310)	(0.00311)	(0.00310)
Macroeconomic conditions	0.132***	0.133***	0.132***	0.131***	0.131***
	(0.0148)	(0.0148)	(0.0149)	(0.0152)	(0.0155)
Inverted shadow rate x	0.0376***				
Financial dependence	(0.00972)				
Inverted Federal funds rate x		0.0310**			
Financial dependence		(0.0140)			
Inverted 2-year rate x			0.0668**		
Financial dependence			(0.0302)		
Inverted 5-year rate x				0.111***	
Financial dependence				(0.0353)	
Inverted 10-year rate x					0.123***
Financial dependence					(0.0391)
Observations	1,363,751	1,363,751	1,363,751	1,363,751	1,363,751
R-squared (within)	0.011	0.011	0.011	0.011	0.011
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes	Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is estimated from a term-structure model based on Krippner (2014), while (inverted) federal funds rate is the interest rate at which US depository institutions lend reserve balances to other depository institutions overnight, on an uncollateralized basis. The 2-year rate, 5-year rate, and 10-year rate are the US treasury bond yields for those respective maturities. Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 7. Robustness: U.S. Monetary Policy Shocks

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.637***	-1.673***	-1.744***	-1.818***	-1.813***
	(0.118)	(0.117)	(0.121)	(0.121)	(0.122)
Profitability	0.104***	0.100***	0.105***	0.107***	0.108***
	(0.00541)	(0.00448)	(0.00470)	(0.00513)	(0.00514)
Tangibility	0.0760***	0.0771***	0.0784***	0.0781***	0.0782***
	(0.00294)	(0.00301)	(0.00311)	(0.00313)	(0.00315)
Macroeconomic conditions	0.154***	0.145***	0.131***		
	(0.0137)	(0.0137)	(0.0152)		
Inverted shadow rate	0.0315***	0.0290***			
	(0.00544)	(0.00426)			
Inverted monetary policy shocks x		0.0316***	0.0300***	0.0269***	0.0194***
Financial dependence		(0.00761)	(0.00695)	(0.00647)	(0.00566)
Observations	1,424,409	1,363,751	1,363,751	1,363,844	1,363,844
R-squared (within)	0.010	0.009	0.011	0.014	0.015
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) monetary shocks are surprises in year-ahead futures on the 3-month Eurodollar deposits based on Gertler and Karadi (2015). Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 8. Robustness: VIX

Leverage	(1)	(2)	(3)	(4)	(5)	(6)
Sales	-1.747***	-1.821***	-1.813***	-1.387***	-1.468***	-1.459***
	(0.121)	(0.121)	(0.122)	(0.126)	(0.124)	(0.124)
Profitability	0.105***	0.107***	0.108***	2.248***	2.279***	2.270***
	(0.00469)	(0.00513)	(0.00513)	(0.285)	(0.281)	(0.279)
Tangibility	0.0784***	0.0780***	0.0782***	0.0762***	0.0755***	0.0756***
	(0.00312)	(0.00313)	(0.00315)	(0.00330)	(0.00323)	(0.00324)
Macroeconomic conditions	0.132***			0.125***		
	(0.0148)			(0.0169)		
Inverted shadow rate x	0.0376***	0.0329***	0.0174**			
Financial dependence	(0.00972)	(0.00928)	(0.00727)			
Inverted VIX x				0.0112***	0.0131***	0.0113***
Financial dependence				(0.00365)	(0.00397)	(0.00327)
Observations	1,363,751	1,363,844	1,363,844	1,361,768	1,361,861	1,361,861
R-squared (within)	0.011	0.014	0.015	0.007	0.011	0.011
Fixed effects						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Time	Yes			Yes		
Country-time		Yes	Yes		Yes	Yes
Sector-time			Yes			Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). The (inverted) VIX is the Chicago Board Options Exchange Market Volatility Index. Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 9. Robustness: Other Global Controls

Leverage	(1)	(2)	(3)	(4)	(5)	(6)
Sales	-1.297***	-1.361***	-1.296***	-1.359***	-1.239***	-1.295***
	(0.133)	(0.125)	(0.134)	(0.127)	(0.130)	(0.125)
Profitability	2.438***	2.342***	2.365***	2.272***	2.383***	2.282***
	(0.298)	(0.300)	(0.288)	(0.289)	(0.291)	(0.288)
Tangibility	0.0740***	0.0754***	0.0747***	0.0762***	0.0744***	0.0759***
	(0.00328)	(0.00327)	(0.00331)	(0.00328)	(0.00332)	(0.00328)
Macroeconomic conditions	0.178***	0.168***	0.119***	0.108***	0.112***	0.0964***
	(0.0140)	(0.0138)	(0.0154)	(0.0137)	(0.0176)	(0.0138)
Inverted shadow rate	0.0561***	0.0478***	0.0676***	0.0600***	0.0637***	0.0559***
	(0.00837)	(0.00577)	(0.00854)	(0.00607)	(0.00894)	(0.00652)
Inverted shadow rate x		0.0284***		0.0273***		0.0292***
Financial dependence		(0.00734)		(0.00640)		(0.00798)
Oil prices			0.0112***	0.0114***		
			(0.00183)	(0.00186)		
Global growth					0.120***	0.130***
					(0.0213)	(0.0199)
Observations	1,422,401	1,361,768	1,422,401	1,361,768	1,422,401	1,361,768
R-squared (within)	0.006	0.006	0.007	0.007	0.006	0.007
Fixed effects						
Firm	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Oil prices and global growth are proxied by World Economic Outlook' Commodity Price Index and Global real GDP growth, respectively. Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 10. Robustness: SMEs

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.651***	-1.648***	-1.703***	-1.776***	-1.764***
	(0.123)	(0.123)	(0.123)	(0.122)	(0.123)
Profitability	0.107***	0.107***	0.109***	0.111***	0.112***
	(0.00549)	(0.00548)	(0.00545)	(0.00548)	(0.00543)
Tangibility	0.0764***	0.0765***	0.0775***	0.0772***	0.0776***
	(0.00297)	(0.00298)	(0.00305)	(0.00305)	(0.00305)
Macroeconomic conditions	0.197***	0.195***	0.141***		
	(0.0147)	(0.0147)	(0.0168)		
Inverted shadow rate	0.0879***	0.0479***			
	(0.0122)	(0.0127)			
Inverted shadow rate x SME		0.0665***	0.0683***	0.0634***	0.0575***
		(0.0137)	(0.0132)	(0.0112)	(0.0109)
Observations	1,424,409	1,424,409	1,424,409	1,424,535	1,424,535
R-squared (within)	0.010	0.010	0.011	0.015	0.015
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). SME is a dummy variable for small and medium-sized enterprises. Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 11. Robustness: Tangibility

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.651***	-1.653***	-1.707***	-1.778***	-1.766***
	(0.123)	(0.123)	(0.123)	(0.122)	(0.123)
Profitability	0.107***	0.107***	0.109***	0.111***	0.112***
	(0.00549)	(0.00548)	(0.00545)	(0.00546)	(0.00539)
Tangibility	0.0764***	0.0763***	0.0772***	0.0770***	0.0774***
	(0.00297)	(0.00296)	(0.00303)	(0.00303)	(0.00304)
Macroeconomic conditions	0.197***	0.195***	0.140***		
	(0.0147)	(0.0147)	(0.0167)		
Inverse shadow rate	0.0879***	0.0730***			
	(0.0122)	(0.0117)			
Inverse shadow rate x TAN		0.0526***	0.0593***	0.0794***	0.0649***
		(0.0122)	(0.0131)	(0.0125)	(0.00912)
Observations	1,424,409	1,424,409	1,424,409	1,424,535	1,424,535
R-squared	0.010	0.010	0.011	0.015	0.015
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. TAN is a dummy variable indicating that a firm's tangible assets are in the lower tertile of the distribution. Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 12. Robustness: SMEs and Tangibility

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.651***	-1.651***	-1.706***	-1.777***	-1.766***
	(0.123)	(0.123)	(0.123)	(0.122)	(0.123)
Profitability	0.107***	0.107***	0.109***	0.111***	0.112***
	(0.00549)	(0.00550)	(0.00547)	(0.00550)	(0.00542)
Tangibility	0.0764***	0.0763***	0.0773***	0.0771***	0.0775***
	(0.00297)	(0.00297)	(0.00303)	(0.00304)	(0.00304)
Macroeconomic conditions	0.197***	0.195***	0.140***		
	(0.0147)	(0.0148)	(0.0169)		
Inverse shadow rate	0.0879***	0.0760***			
	(0.0122)	(0.0109)			
Inverse shadow rate x TAN x SME		0.0683***	0.0753***	0.0886***	0.0732***
		(0.0157)	(0.0159)	(0.0137)	(0.0125)
Observations	1,424,409	1,424,409	1,424,409	1,424,535	1,424,535
R-squared	0.010	0.010	0.011	0.015	0.015
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. SME is a dummy variable for small and medium-sized enterprises. TAN is a dummy variable indicating that a firm's tangible assets are in the lower tertile of the distribution. Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 13. Robustness: Clustering—Sector and Time

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.651***	-1.697***	-1.747***	-1.821***	-1.813***
	(0.173)	(0.167)	(0.161)	(0.160)	(0.162)
Profitability	0.107***	0.103***	0.105***	0.107***	0.108***
	(0.0120)	(0.0119)	(0.0124)	(0.0133)	(0.0134)
Tangibility	0.0764***	0.0773***	0.0784***	0.0780***	0.0782***
	(0.00698)	(0.00714)	(0.00746)	(0.00761)	(0.00765)
Macroeconomic conditions	0.197***	0.188**	0.132***		
	(0.0751)	(0.0780)	(0.0484)		
Inverted shadow rate	0.0879**	0.0794**			
	(0.0352)	(0.0360)			
Inverted shadow rate x		0.0386***	0.0376***	0.0329***	0.0174**
Financial dependence		(0.00963)	(0.0102)	(0.00964)	(0.00825)
Observations	1,287,828	1,230,537	1,230,537	1,230,622	1,230,622
R-squared (within)	0.010	0.010	0.009	0.009	0.009
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

Source: Authors' calculations.
Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Standard errors are two-way clustered by sector (two-digit level) and time, respectively. Fixed-effects are not reported.

Table 14. Robustness: Clustering—Other

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.469***	-1.469***	-1.469***	-1.469***	-1.469***
	(0.0380)	(0.178)	(0.333)	(0.305)	(0.331)
Profitability	2.282***	2.282***	2.282***	2.282**	2.282***
	(0.160)	(0.401)	(0.474)	(0.934)	(0.487)
Tangibility	0.0754***	0.0754***	0.0754***	0.0754***	0.0754***
	(0.00167)	(0.00437)	(0.00474)	(0.00598)	(0.00508)
Inverted Shadow Rate x	0.0261***	0.0261**	0.0261**	0.0261**	0.0261***
Financial dependence	(0.00546)	(0.00982)	(0.0106)	(0.0110)	(0.00858)
Observations	1,361,861	1,361,861	1,361,861	1,228,994	1,228,994
R-squared (within)	0.011	0.011	0.011	0.006	0.006
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Country-time	Yes	Yes	Yes	Yes	Yes
Cluster					
Firm	Yes				
Sector (SIC 1 digit)		Yes			
Country			Yes		
Country and time				Yes	
Country and sectors					Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Standard errors are clustered two-way in regressions 4 and 5. Fixed-effects are not reported.

Table 15. Robustness: Firm Fundamentals

Leverage	(1)	(2)	(3)
Sales		-1.468***	
		(0.123)	
Profitability	1.320***	2.277***	1.318***
	(0.328)	(0.281)	(0.328)
Tangibility	0.0615***	0.0754***	0.0615***
	(0.00169)	(0.00322)	(0.00169)
Total assets	-3.749***		-3.747***
	(0.444)		(0.444)
Median sector leverage		-0.247***	-0.142*
		(0.0721)	(0.0754)
Inverted shadow rate x	0.0134*	0.0277***	0.0142*
Financial dependence	(0.00738)	(0.00736)	(0.00762)
Observations	1,669,413	1,361,861	1,669,413
R-squared (within)	0.017	0.011	0.017
Fixed effects			
Firm	Yes	Yes	Yes
Country-time	Yes	Yes	Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is the total liabilities-to-total assets ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Total assets are an alternative measure for size. Median sector leverage is computed for each sector (two-digit level) and each year. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Table 16. Robustness: Alternative Leverage Ratios

Leverage	(1) TLTE	(2) TATE	(3) NTLTA	(4) NTLTE	(5) NTATE
Sales	-0.157***	-0.163***	-1.456***	-0.194***	-0.198***
	(0.0183)	(0.0200)	(0.110)	(0.0220)	(0.0235)
Profitability	0.367***	0.382***	3.396***	0.434***	0.443***
	(0.0552)	(0.0596)	(0.396)	(0.0758)	(0.0814)
Tangibility	0.00799***	0.00823***	0.0388***	0.00572***	0.00584***
	(0.000485)	(0.000512)	(0.00542)	(0.000783)	(0.000824)
Inverted Shadow Rate x	0.00693***	0.00797***	0.0188**	0.00820***	0.00899***
Financial dependence	(0.00190)	(0.00215)	(0.00716)	(0.00220)	(0.00241)
Observations	1,361,796	1,361,796	895,177	895,125	895,125
R-squared (within)	0.003	0.003	0.009	0.003	0.003
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Country-time	Yes	Yes	Yes	Yes	Yes

Source: Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is a different measure of leverage in each regression. TLTE stands for the total liabilities-to-total equity ratio (first differenced). TATE stands for the total assets-to-total equity ratio (first differenced). NTLTA stands for the total liabilities (net of cash)-to-total assets ratio (first differenced). NTLTE stands for the total liabilities (net of cash)-to-total equity ratio (first differenced). NTATE stands for the total assets (net of cash)-to-total equity ratio (first differenced). Sales is the logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant, and equipment to total assets. Firm-specific regressors are first differenced and lagged. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Standard errors are clustered by sector (two-digit level). Fixed-effects are not reported.

Appendix Table 1. Country and Firm Coverage (Orbis)

Panel A.

Country	N	in %
Argentina	729	0.2
Brazil	2,833	0.7
Bulgaria	8,393	2.0
Chile	158	0.0
China	209,381	49.1
Colombia	11,472	2.7
Croatia	7,055	1.7
Hungary	11,474	2.7
India	2,754	0.6
Indonesia	335	0.1
Kazakhstan	119	0.0
Lithuania	2,313	0.5
Mexico	902	0.2
Pakistan	149	0.0
Peru	437	0.1
Philippines	1,044	0.2
Poland	24,342	5.7
Republic of Korea	48,985	11.5
Romania	15,729	3.7
Russian Federation	45,933	10.8
Serbia	6,571	1.5
Turkey	4,150	1.0
Ukraine	21,156	5.0
Venezuela	17	0.0
Total	**426,431**	**100.0**

Panel B.

Size Category	N	in %
Very large company	20,059	4.7
Large company	144,193	33.8
Medium sized company	225,119	52.8
Small company	37,060	8.7
Total	**426,431**	**100.00**

Panel C.

BvD Major Sector	N	in %
Chemicals, rubber	61,197	14.4
Construction	26,515	6.2
Education, Health	3,074	0.7
Food, beverages	27,146	6.4
Gas, Water, Electricity	9,975	2.3
Hotels & restaurants	3,801	0.9
Machinery, equipment	86,453	20.3
Metals & metal prod.	36,048	8.5
Other services	23,544	5.5
Post & telecom.	1,222	0.3
Primary sector	23,218	5.4
Publishing, printing	7,326	1.7
Textiles, wearing ap.	36,243	8.5
Transport	10,145	2.4
Wholesale & retail	58,083	13.6
Wood, cork, paper	12,441	2.9
Total	**426,431**	**100.0**

Sources: Orbis Database; Authors' calculations.

Note: BvD = Bureau van Dijk Electronic Publishing. Cross-sectional statistics presented for 2007. The criteria for firm size categories follow BvD's definitions.

Appendix Table 2. Summary Coverage: Orbis versus Worldscope

	Orbis	Worldscope
Number of firms	426,431	41,179
Type	Listed and Non-listed	Listed only
Countries	24 EMs	18 EMs & 33 AEs
Time span	2004 - 2013	1995 - 2014

Sources: Orbis Database; Worldscope Database; Authors' calculations.

Note: Countries covered in Orbis are listed in Appendix Table 1. Worldscope country coverage: 1) AEs: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, South Korea, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan, United Kingdom, and United States; EMs: Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Lithuania, Malaysia, Mexico, Peru, Philippines, Poland, Romania, Russian Federation, Thailand, and Turkey.

Appendix Table 3. Listed firms: EM Corporate Leverage and Global Financial Conditions

Leverage: TDTA	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	EM			AE			ALL		
Sales	-0.323*	-0.253	-0.357*	0.262**	0.262*	0.135	0.157	0.183	0.0652
	(0.172)	(0.181)	(0.184)	(0.125)	(0.134)	(0.135)	(0.107)	(0.115)	(0.116)
Profitability	0.0277**	0.0374***	0.0357***	0.0215***	0.0205***	0.0194***	0.0218***	0.0214***	0.0203***
	(0.0124)	(0.0129)	(0.0130)	(0.00408)	(0.00428)	(0.00430)	(0.00391)	(0.00412)	(0.00413)
Tangibility	0.0301***	0.0255***	0.0291***	0.0174***	0.0177**	0.0176**	0.0207***	0.0194***	0.0207***
	(0.00689)	(0.00742)	(0.00743)	(0.00671)	(0.00728)	(0.00731)	(0.00533)	(0.00582)	(0.00584)
Macroeconomic conditions	-0.0353	-0.0317	-0.00299	0.0381*	0.0351*	0.0660**	0.0167	0.0191	0.0314*
	(0.0262)	(0.0282)	(0.0349)	(0.0200)	(0.0211)	(0.0261)	(0.0153)	(0.0163)	(0.0179)
Inverted Shadow Rate	0.0338**	0.0348**		0.0324***	0.0249**		0.0276***	0.0223***	
	(0.0135)	(0.0147)		(0.00973)	(0.0105)		(0.00766)	(0.00831)	
Inverted Shadow Rate x		0.0625**	0.0609**		0.0397**	0.0378*		0.0475***	0.0443***
Financial Dependence		(0.0254)	(0.0254)		(0.0194)	(0.0194)		(0.0155)	(0.0155)
Observations	75,445	66,354	66,354	262,630	242,170	242,170	338,075	308,524	308,524
R-squared (within)	0.001	0.002	0.004	0.001	0.001	0.004	0.001	0.001	0.004
Number of firms	9,785	8,591	8,591	31,394	28,875	28,875	41,179	37,466	37,466
Fixed Effects:									
Firm	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time			YES			YES			YES

Sources: Worldscope Database; Authors' calculations.

Note: ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The dependent variable is total debt-to-total assets (TDTA, first differenced). Sales is logarithmic transformation of total sales. Profitability is measured by the return-on-assets, while tangibility is the ratio of net property, plant and equipment to total assets. Firm specific regressors are lagged and first differenced. Macroeconomic conditions are measured by the ICRG economic and financial index. Financial dependence is an updated version of the original Rajan and Zingales (1998) index based on Tong and Wei (2011). The (inverted) shadow rate is based on Krippner (2014). Period covered 1995-2014. ALL includes listed firms from both emerging markets (EM) and advanced economies (AE). Fixed effects are not reported.

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