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Corporate Leverage in EMEs:
Has the Global Financial Crisis
Changed the Determinants?

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Abstract

Has the global financial crisis changed the pivotal determinants of corporate leverage in EMEs? This paper attempts to address this issue using a panel-GMM framework and quantile-analysis for 10 major EMEs. Analysing 19-year database covering the period 1996-2014, the study finds that enabling conditions in the financial markets in the post-crisis period facilitated higher corporate leverage notwithstanding slower growth, which is in contrast to its largely pro-cyclical behaviour. Furthermore, the results suggest that global factors like world GDP growth and Fed shadow rate assumed centre stage while some of the traditional drivers like domestic growth and firm-specific factors faded away as determinants of corporate leverage in the post-crisis period. These findings evince policy concerns, as the former set is exogenously determined depriving the EMEs of their conventional endogenous domestic set of policy levers.

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Introduction

The global financial crisis (GFC) which started with failure of Lehman Brothers in 2008 has changed the central banking landscape by re-emphasizing their role in financial stability and its systemic influence on monetary and price stability. Several macroprudential indicators that were peripherally captured in the central banks' radar were brought to fore in the aftermath of the GFC. Corporate leverage is one such variable that registered significant increase in the aftermath of the crisis, especially in EMEs. It is neither a coincidence nor an accident that multilateral organisations (IMF, 2014; *Chui et. al.*, 2014) and think-tanks (CIEPR, 2015) have been harping upon high corporate leverage in most of their publications in the post-GFC period. At this juncture, this study takes a deep dive to address issues relating to changing determinants of corporate leverage for EMEs in the post-GFC period so as to equip policymakers in ring-fencing their economies against global liquidity spillovers and adverse systemic fall-outs.

The theme is triggered by an ongoing debate surrounding the corporate leverage literature. The traditional school of thought pioneered by Modigliani and Miller's 'irrelevance hypothesis', which was later extended to pecking order theory (Myers, 1984) and market timing theory (Baker and Wurgler, 2002), emphasise the role of firm specific and industry specific determinants such as the profitability of firms, asset tangibility, market to book value ratio *etc.* Later studies, notably Rajan and Zingales (1995) and Borio (1990), however, underline the importance of country-specific macroeconomic and institutional factors as drivers of corporate leverage. In the aftermath of GFC, while the macroeconomic scenario was characterised by abundant liquidity, low global interest rates and world growth and spike in corporate leverage in EMEs leading to riddle whether the first has caused the later and what could be the policy implications of such an alliance. Our findings suggest that this issue assumes importance because in the changed scenario, drivers of corporate leverage are no longer limited to domestic factors that can be influenced by internal policy initiatives, but are exogenous from the perspective of EMEs, which highlights financial stability risk.

The major contribution of the study lies in explicitly evaluating the role of exogenous global factors such as world GDP growth and the Fed shadow rate as drivers of corporate leverage in EMEs. Besides, it analyses changed role of traditional determinants of corporate leverage, both firm and country specific, in the post-crisis environment. The study also adds to the existing research as it uses
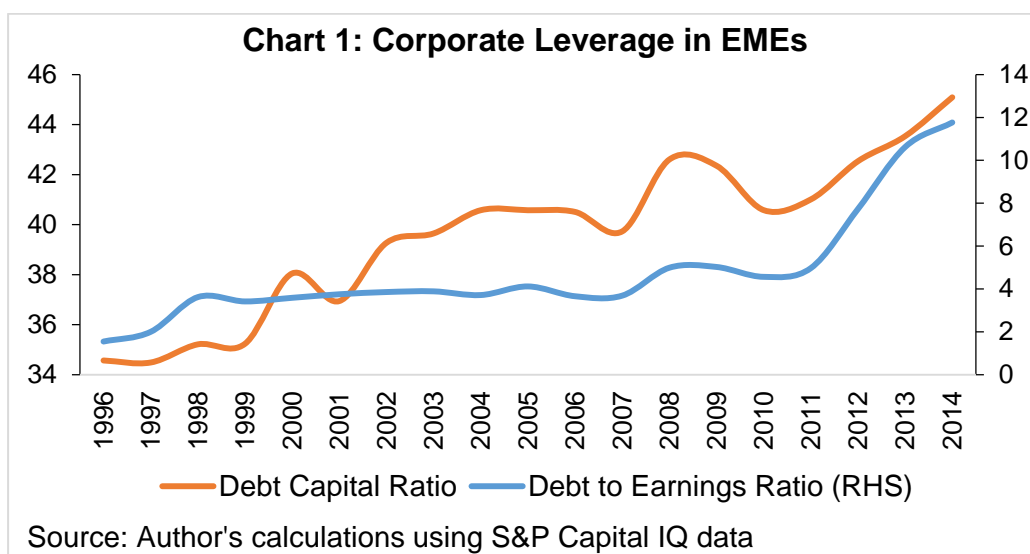
financial conditions indicator (FCI) for each EMEs taking cognisance of co-movement of financial variables and to get a comprehensive view.

The present paper is organised as follows. Section I sets out the motivation of the study; Section II presents the literature survey; in Section III we evaluate the links between the variables used in the empirical exercise and their relationship with corporate leverage and also set out the contributions of this study to the literature; Section IV documents the data and methodology used in this study; Section V evaluates the empirical results and Section VI concludes with policy implications.

II. Motivation

One of the major themes of research in corporate leverage has been whether, over a period of time, the capital structure of firms remains unchanged leading to significantly stable leverage ratios (Hanousek and Shamshur, 2011). Recent research suggests that leverage cross-sections differ markedly over a few years, with no sign of reverting or stabilising. Research suggests that models with time-varying target leverage ratios can best replicate this behaviour in corporate leverage (DeAngelo and Roll, 2015).

Corporate leverage in EMEs, which averaged around 49 per cent of GDP between 2003 and 2008, rose substantially to around 55 per cent of GDP during 2009-2014 (*see* IMF, 2014). The increase in debt was accompanied by lower earnings in a weak macroeconomic environment and, as a result, debt earnings ratio as well as debt capital ratio increased significantly (Chart 1).

Chart 1: Corporate Leverage in EMEs

Legend: Debt Capital Ratio — Debt to Earnings Ratio (RHS)

Source: Author's calculations using S&P Capital IQ data

This build-up in corporate leverage in EMEs has been happening amid the macroeconomic conditions that characterise the aftermath of the GFC. World GDP growth has remained weak, with considerable uncertainty about revival. As a

response to the financial market turmoil and its cascading effects on the real economy, interest rates in most advanced economies, led by the US Fed, remained at historically low levels (Chart 2a). Even though the GFC did not originate in EMEs, the real and financial sectors of EMEs were adversely affected as reflected in the GDP slowdown after the crisis and the financing conditions that corporates faced in raising domestic resources. The FCI in Chart 2b represents the average of country-wise FCI for issuance of corporate debt. This FCI is calculated from each country's money market interest rates, stock market returns and liquidity and government bond market yields, using principal component analysis.

Chart 2: Macroeconomic Conditions

a: Global Conditions

b: Domestic growth and financing conditions in EMEs
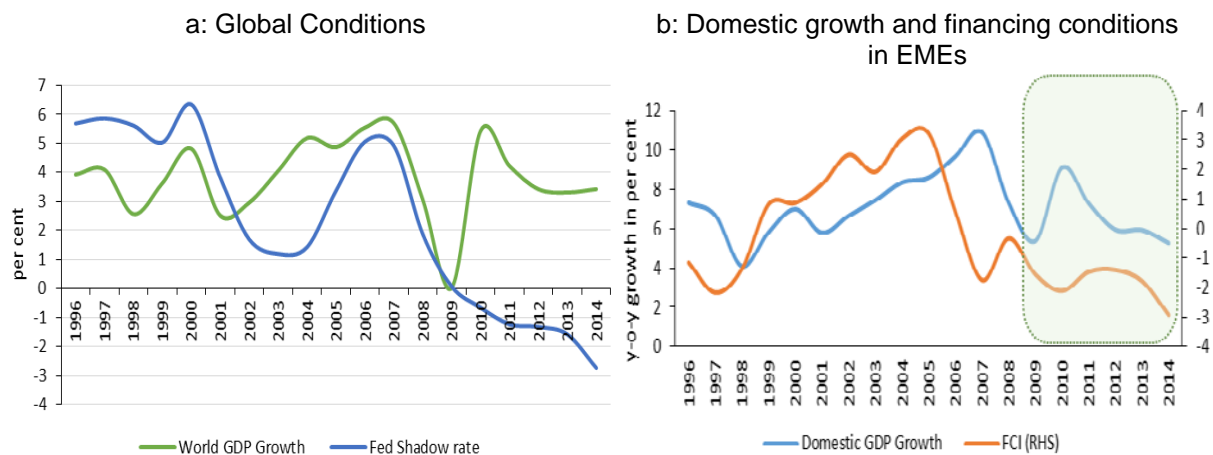
Even though the current leverage ratios in EMEs are lower than their levels in the 1990s, the rapid rise in corporate leverage, especially considered against the backdrop of other macroeconomic factors like low growth, falling commodity prices and the risk of imminent rise in policy rates in the advanced economies (AEs), has raised policy concerns. The empirical literature suggests that build-up and subsequent drawdown of corporate leverage is often cyclical (Mendoza and Terrones, 2008). To understand the risks and policy implications of high corporate leverage, it is important to understand the causes behind the high leverage.

III. Literature Survey

The 'traditional' models of corporate leverage, starting from Modigliani and Miller's 'irrelevance hypothesis' which was later extended to pecking order theory (Myers, 1984) and market timing theory (Baker and Wurgler, 2002), emphasise the role of firm specific and industry specific determinants, although no consensus seems to be emerging (Frank and Goyal, 2009). Some studies agree that leverage increases with tax incentives favouring debt, firm size, fixed assets and growth opportunities but decreases with advertising expenditure, volatility, bankruptcy

probabilities, research and development expenditures, uniqueness and profitability of the product (Harris and Raviv, 1991). Other studies do not provide support for the hypothesis that collateral value, non-debt tax shields, future growth or volatility have an effect on debt ratios (Titman and Wessels, 1988). Several other studies have identified factors such as industry median leverage, depreciation, liquidity, maturity of assets and financial constraints as determinants of corporate leverage (Korajczyk and Levy, 2003; Frank and Goyal, 2009; Hanousek and Shamshur, 2011; Gungoraydinoglu and Oztekin, 2011). These theories and the empirical research have focused on firm- and industry-specific determinants of leverage even as no consensus seems to be emerging either from the supporting theories or the empirical evidence (Frank and Goyal, 2009; Lemmon *et al.*, 2008). Some studies agree that leverage increases with tax incentives favouring debt, firm size, fixed assets and growth opportunities but decreases with advertising expenditure, volatility, bankruptcy probabilities, research and development expenditures, uniqueness and profitability of the product (Harris and Raviv, 1991). Other studies do not provide support for the hypothesis that collateral value, non-debt tax shields, future growth or volatility have an effect on debt ratios (Titman and Wessels, 1988). Several other studies have identified factors such as industry median leverage, depreciation, liquidity, maturity of assets and financial constraints as determinants of corporate leverage (Korajczyk and Levy, 2003; Frank and Goyal, 2009; Hanousek and Shamshur, 2011; Gungoraydinoglu and Oztekin, 2011).

Apart from firm-specific determinants, a growing body of literature incorporates country-level characteristics to explain a firm's leverage. Rajan and Zingales (1995) analysed corporate capital structures in G-7 countries and concluded that while firm leverage is similar across countries, the differences amongst them cannot be easily explained by the institutional characteristics of these countries. Borio (1990) also suggested that a number of institutional characteristics, including simultaneous holding of debt and equity, lower fragmentation of debt claims and government policy, have been conducive to support relatively high debt burdens. Starting from this, a huge body of literature has developed that tries to identify country-specific factors that may have an impact on corporate leverage and can explain cross-country differences in corporate leverage.

Within this strand of literature, two lines of thought can be identified; the first identifies country-specific, time-variant factors like GDP growth, inflation, stock and bond market development and deepening of the banking sector as determinants of corporate leverage (Frank and Goyal, 2009; Kayo and Kimura, 2011). The second line identifies institutional factors like the corruption perception index, bank/ market-based financial system, agency costs, bankruptcy costs and information asymmetry costs as explanatory variables (Gungoraydinoglu and Oztekin, 2011; Hanousek and

Shamshur, 2011). Empirical work related to these factors often combines firm-level, macroeconomic and institutional factors in varying degrees. Some research studies conclude that a country's institutional characteristics are systematically related to cross-country differences in firm's choices of capital structure due to the impact of various costs including bankruptcy, information asymmetry and agency costs imposed on firms. This implies that a firm's capital structure is not only determined by its own characteristics but is also influenced by the environmental and traditional factors under which the firm operates (Gungoraydinoglu and Oztekin, 2011). Others have found that the adjustment speed of aligning a firm's capital structure to the 'optimal leverage' is influenced significantly by the country's legal and financial traditions (Oztekin and Flannery, 2012).

Research on the impact of macroeconomic variables on corporate leverage typically reports low explanatory power of these variables, especially compared with firm-level variables (Booth *et al.*, 2001; Kayo and Kimura, 2011; Gungoraydinoglu and Oztekin, 2011). This, however, does not mean that it is futile to pursue such studies since the low explanatory power could be due to several reasons. Frank and Goyal (2009) suggest that the explanatory power is low simply because country-level factors vary less than firm-level factors. Kayo and Kimura (2011) point out that it is important to include such factors as their inclusion improves the performance of the aggregate model.

Since the focus of the present paper is analysing the changes in drivers of corporate leverage before and after the financial crisis, we do not explicitly introduce institutional, time-invariant factors in the model. These variables, though possibly important in analysing the drivers of corporate leverage, are captured through country-specific dummies. This study concentrates on firm-level and macroeconomic drivers, which may have changed significantly after the crisis, to understand how an exogenous macroeconomic shock affects corporate capital structure decisions.

IV. Firm-specific, Domestic and Global factors and Corporate Leverage

As mentioned in the literature survey, innumerable firm-specific factors as well as macroeconomic factors have been analysed in the literature for their impact on corporate leverage. As the focus of the present paper is on comparing the determinants of EME corporate leverage before and after the GFC, we narrow our focus to a few variables. As a starting point, we begin with five firm-specific factors that have been identified by Frank and Goyal (2009) as 'reliably important' determinants of corporate structure. These factors include firm specific factors like tangibility, profitability, market-to-book value ratio and firm size as well as median leverage of the industry to which the firm belongs. To these firm-specific factors, the

present paper adds domestic and global macroeconomic factors as well as the financing condition indicator as explanatory variables. Frank and Goyal (2009) also identified domestic inflation as a reliably important determinant of corporate leverage. However, since we have incorporated real interest rates in the FCI, inflation is implicitly captured and hence is not explicitly added in the specification. Earlier studies document the influence of institutional factors such as information asymmetry costs, agency costs, bankruptcy costs, insider information and securities market enforcement (Gugoraydinoglu and Oztekin, 2011). However, since the emphasis of the present paper is on evaluating the drivers of corporate leverage before and after the GFC, these institutional time-invariant factors are captured through the use of country dummies. The aim of the present section is to discuss the economic rationale behind the macroeconomic explanatory variables considered in this paper[2].

Domestic and Global GDP growth: During a high GDP growth phase, stock prices generally move up, expected bankruptcy costs decline and taxable income increases. Cash held by corporates also increases. Firms are likely to raise more resources during this phase to finance their expansion plans. The value of corporate collateral follows a pro-cyclical trend and is higher during this phase. If firms raise resources through borrowings against the collateral, the leverage may be pro-cyclical.

In the present study, apart from domestic GDP growth, global GDP growth has also been included as an explanatory variable in recognition of the fact that in an environment characterised by increased integration of markets, corporate leverage may be expected to be influenced by domestic as well as international factors. Also, as domestic and global GDP have diverged periodically, especially in the period after the GFC, it is important to explicitly include both variables separately.

Global interest rates: The trade-off theory suggests that corporates weigh the cost and benefits of debt *vis-a-vis* equity to take decisions about how to raise funds. In high and increasing interest rate scenarios, firms are likely to substitute equity for debt to reduce their interest expenditure, implying a negative relationship between the two. In the present context, the unprecedented, accommodative, global monetary conditions that prevailed in the aftermath of the GFC may have encouraged corporate leverage in EMEs through several channels. Following Caruana (2012) and He and McCauley (2013), three major transmission channels can be identified. First, EMEs tend to set lower interest rates than AEs to offset currency appreciation pressures. Second, large-scale asset purchases in the AEs affected bond yields not

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[2] Frank and Goyal (2009) present a detailed literature survey of firm specific factors that are reliably important in determining corporate leverage and the same is avoided for brevity.

only in the countries where policy actions were initiated, but also in EMEs due to portfolio rebalancing. In addition, the 'search for yield' following the highly accommodative monetary policy in the AEs resulted in greater capital flows to most of the EMEs. Third, any change in policy rates in the AEs quickly affects the debt-servicing burden of emerging market foreign currency denominated debt with variable rates. Thus the widespread availability of low cost funding and appreciated collateral values in expansionary global monetary conditions facilitate greater corporate leverage and helping to reduce emerging market borrowing constraints (IMF, 2015).

In recognition of the fact that in a globalised world, interest rates of major central banks directly or indirectly influence corporate leverage decisions, this paper explicitly introduces global interest rates by using the Wu-Xia shadow Federal Funds rate as a proxy.

Domestic Financial Conditions

One of the contributions of this paper is to introduce financing conditions as an explanatory variable of corporate leverage. While global factors directly affect corporate leverage decisions of firms with foreign debt exposure, firms that have only domestic debt exposures are also not completely insulated from their influence. Our hypothesis is that global conditions affect these companies indirectly. At least three major channels can be identified: first, low global interest rates exert downward pressure on domestic interest rates; second, low global growth translates to low external demand and lower growth prospects for EME corporates, which adversely affects their stock returns and stock market liquidity; and, third, the lower growth macroeconomic scenario may require larger government deficits, which may crowd out corporate debt. One way of taking cognisance of these financial market variables is to introduce each of them separately in the equation, especially when there is some doubt about the expected sign of the relationship for each variable. However, this poses a multicollinearity problem. This paper hypothesises that there is an inverse relationship between these variables and corporate leverage; since these variables may be interrelated, a financial conditions indicator (FCI) is constructed and used as an explanatory variable. The links between financial condition variables and corporate leverage are discussed below.

a) *Stock market conditions:* The static trade-off theory suggests that strong stock market performance is followed by an increase in leverage as firms try to move towards their 'optimal' leverage ratio. However, market timing theory suggests that managers actively 'time' the equity markets to take advantage of mispricing, resulting in a negative relationship between stock market prices and leverage. Demirgüç-Kunt and Maksimovic (1996) suggest that the

relationship between stock market development on corporate leverage depends on the development stage of the stock market. When a relatively underdeveloped stock market begins to develop, firms initially not only issue new equity but also tend to borrow more from the debt market. As stock market development continues, the firms begin to substitute equity for debt.

We have used three proxies to represent stock market conditions. The stock market capitalisation-to-GDP ratio represents the development of the market; the stock market returns-to-GDP ratio represents the payoffs in the stock market; and the value traded-to-GDP ratio represents market liquidity. Following the literature, the hypothesis is that each of these variables is inversely related to corporate leverage. Specifically, in a well-developed and liquid stock market that yields higher returns, it is lucrative to issue equity and *ceteris paribus* less reliance on corporate debt is expected.

b) *Government debt:* Several studies suggested that an increase in government debt results in higher interest rates, which in turn crowds out private investment (*e.g.*, literature surveys by Elmendorf and Mankiw, 1999; Hubbard, 2011). Some empirical studies in this area have documented a negative relationship between government debt and corporate debt of non-financial firms (Graham, Leary and Roberts, 2014). However, other studies suggest that the links between the two depend on changes in both rates of taxation and market interest rates due to increased government borrowings and therefore the final impact could be ambiguous (Benninga and Talmor, 1988).

We have introduced two proxies for government debt: first, the public debt-to-GDP ratio, which represents the extent of government indebtedness, and second, the long-term G-sec yield, which is a proxy for long-term, risk-free interest rates.

c) *Domestic interest rates:* As emphasised by Barry *et al.* (2008), "[i]n the neoclassical theory of investment, a drop in the cost of capital results in increased investment spending. As firms increase their investments, all else equal, they also tend to issue new debt to finance a portion of those investments. Thus, debt issuance can be a function of the level of capital investment by firms". Examining the relationship between debt issues and the level of interest rates relative to historical levels, they found that companies issue more debt, more debt relative to investment spending, and more debt compared to equity when interest rates are low relative to historical rates.

We have included call money rate, interest spread and real interest rate to cover the entire gamut of short-term interest rates. Details regarding country-

wise instruments used for calculation of the FCI are provided in Table 1. The expected signs of determinants of corporate leverage are summarised in Table 2.

V. Data and Methodology

This study concentrates on 10 major EMEs, *viz.*, Brazil, China, India, Indonesia, Malaysia, Mexico, the Philippines, Russia, South Africa and Thailand. Annual balance sheet data for firms with total asset size of more than US$ one billion in 2014 were chosen for this study. The balance sheet data was sourced from S&P Capital IQ. Countries like Chile, Peru and Turkey were also considered for the study but had to be excluded for lack of consistent data. All the corporates, whether currently operational or not, were included in the sample to avoid 'survival bias'. These companies consist of public and private non-financial corporates from eight major industry groups, *viz.*, energy, materials, industrials, consumer discretionary, consumer staples, healthcare, telecommunication services and utilities. Financial corporations and banks were not included in the sample because the regulations governing their leverage are well specified across major jurisdictions and well supervised. In contrast, there are no regulatory rules regarding corporate leverage; it is more of a choice, based on pros and cons, than a regulatory requirement. Annual data for 2,331 corporates for 1996-2014 were considered for this study. Further, country-specific and global data were collected from a variety of sources, including the World Economic Organization, Bloomberg, Federal Reserve of Atlanta, Federal Reserve Bank of St. Louis, BIS and the World Bank. A detailed list of these variables, their description and data sources is given in Table 3. Summary statistics is presented in Table 4. The data was appropriately winsorized at 90 per cent to reduce the effects of possibly spurious outliers.

The starting point for any empirical estimation of corporate leverage is defining corporate leverage because opinions differ considerably. Several empirical studies view book leverage as just a 'plug number' to balance both sides of the balance sheet. Advocates of the use of market leverage argue that book measure is backward looking whereas market measure is forward looking, and the two may not necessarily match (Welch, 2004).

On the other hand, some researchers suggest that managers focus on book leverage because debt is better supported by assets in place rather than by its growth opportunities (Myers, 1977). Moreover, market leverage fluctuates widely in line with the financial markets and therefore that can be an unreliable guide to corporate structure decisions. Therefore, we use book leverage as a dependent variable.

Apart from the debate about market *vs.* book leverage, the definition of debt has been a topic of academic discussion. While some authors advocate the use of long-term debt as a dependent variable, others choose total debt or total liabilities. In the present paper, we report the results of a broad definition of book leverage, *viz.,* the debt-to-earnings ratio. However, we have also carried out robustness checks using other indicators such as debt-to-capital ratio, debt-to-equity ratio and liabilities-to-asset ratio. The results are largely in line with the trend observed in the tests carried out using the debt-to-earnings ratio as the dependent variable.

To test the impact of firm-specific, domestic and global macroeconomic factors on corporate leverage, we use the partial adjustment model, which is well accepted in the literature (Flannery and Rangan, 2006; Gungoraydinoglu and Oztekin, 2011; IMF, 2015; Korajczyk and Levy, 2003; Oztekin and Flannery, 2012). We start by assuming that every firm has a desired level of long-term leverage.

In the present paper, the firm-specific factors considered are profitability, tangibility, market-to-book value ratio, size of firm and the median industry leverage. The country-specific macroeconomic factors are GDP growth and FCI, while global macroeconomic factors that may affect corporate leverage are global GDP and the Fed shadow rate. Further, an interaction term that captures the impact of firm-level, country-level and global macroeconomic factors on each other is introduced. Incorporating these factors, the baseline reduced form model is:

$$\text{Lev}^{*}_{ijt} = \beta_f \, X_{ijt-1} + \beta_m Y_{ijt-1} + \beta_{fm} \, X_{ijt-1} \, Y_{ijt-1} + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots(I)$$

where Lev^{*}_{ijt} is the desired long-term leverage of firm 'i' in country 'j' at time 't'. β_f, β_m and β_{fm} are coefficient vectors to be estimated. X_{ijt} and Y_{jt} are vectors of firm-level and macroeconomic factors affecting corporate leverage. $X_{ijt} Y_{ijt}$ is the interaction term between firm-level and macroeconomic factors.

With reference to equation (I), rebalancing costs may slow down the firm's adjustment towards this level. Thus, the partial adjustment model is:

$$\text{Lev}_{ij,t} - \text{Lev}_{ij, t-1} = \Lambda \, (\text{Lev}^{*}_{ij,t} - \text{Lev}_{ij,t-1}) + \varepsilon_{ij,t}\ldots\ldots\ldots\ldots\ldots\ldots\ldots(II)$$

where 'Λ' is the adjustment parameter.

Combining (I) and (II) and rearranging, we get,

$$\text{Lev}_{ij,t} = (1- \Lambda)\text{Lev}_{ij, t-1} + (\Lambda \beta_f) \, X_{ij,t-1} + \Lambda \beta_m \, Y_{ijt-1} + \Lambda \beta_{fm} \, X_{ij,t-1} \, Y_{ijt-1} + \Lambda \mu_i + \varepsilon_{ij,t}\ldots\ldots\ldots(III)$$

Equation III implies that the leverage of firm 'i' from country 'j' at period 't' depends on its past leverage, firm-specific factors such as profitability, market-to-

book value *etc.*, domestic macroeconomic factors and global macroeconomic factors.

Country- and time-specific dummies are also added to the specification.

Thus, the aim of the empirical estimation is to check whether the impact of individual βs on corporate leverage is statistically significant (*i.e.,* β≠0). Further, the sign of the coefficient (*i.e.,* β < 0 or β > 0) is expected to be in line with the suggested hypotheses.

Equation (III) represents a dynamic panel model since it consists of an endogenous lagged dependent variable (Lev ij, t) and other potentially endogenous explanatory variables. It is now well recognised that the application of OLS on dynamic panel models may yield biased and inconsistent estimators. One method of addressing this problem is to use Generalised Method of Moments (GMM) proposed by Arellano and Bond (1991). However, these econometric techniques have been criticised for neglecting the crucial stationarity and cointegration aspects of panel data. In view of this, we first check for stationarity of the panel series using the tests given in Levin, Lin and Chu (2002) and Im, Pesaran and Shin (2003). Our results indicate that all the series under consideration are I(0), and therefore are stationary. Since the stationarity issue is resolved, the GMM technique can be applied without hesitation.

While estimating Equation (III) using GMM, we control for potential endogeneity of the firm-specific variables and the interaction term using lags of the same variables as instruments. We take a limited number of lags in order to maintain parsimony in the number of instruments following Roodman (2009). We employ the Sargan test for over-identified restriction in the GMM dynamic panel model. We ensure that there are no second-order serial correlations in the first difference residuals given by AR(2). Apart from testing for the entire sample period 1996-2014, we test for two sub-samples, *viz*. 1996-2007 and 2009-2014, to test whether the drivers of leverage have changed significantly over the two periods.

VI. Empirical Results

Firm-specific factors

Analysing corporate leverage in terms of the debt-to-earnings ratio over the entire period (1996-2014) and two sub-periods for the EMEs in the sample suggests a few interesting results (Table 5). Firm-specific factors such as profitability, tangibility, market-to-book value ratio and firm size emerge as important determinants of corporate leverage.

The coefficients of profitability of the firm are significant across both sub-samples as well as the entire period, with a negative sign, which is consistent with the dynamic trade-off theory as well as pecking order theory.

The coefficients of tangibility are significant for the entire sample period and the pre-GFC period, with a negative sign. This is consistent with the pecking order theory, which suggests that low information asymmetry relating to tangible assets makes equity issuances relatively less costly and therefore the leverage ratio is lower for firms with higher tangibility.

Our results imply that firms with more tangible assets found tapping the equity market more lucrative and were thus less leveraged in the pre-financial crisis period. In the post-crisis period, however, tangibility ceases to be a significant determinant of corporate leverage, possibly suggesting that debt issuing conditions were lucrative for all firms, irrespective of whether they had high or low levels of tangible assets.

The market-to-book value ratio is also significant both before and after the GFC, and the coefficient has a positive sign, which is consistent with the pecking order theory.

Firm size, the coefficient of which is not found to be significant before the GFC, turns out to be significant in the post-financial crisis period, with a positive sign. This implies that larger firms are more leveraged in the post-financial crisis period.

The coefficients of lagged leverage are significant across the full sample period as well as for both sub-samples, all with a positive sign. This is consistent with the theoretical framework, which suggests that corporates attempt to attain an optimal level of leverage. Since the distance of the present time period leverage from optimal leverage depends on the lagged leverage, the significant coefficient is as per our hypothesis. The positive sign of the coefficient is consistent with the findings of Lemmon, Roberts and Zender (2008) that suggest that firms with high (low) leverage maintain relatively high (low) leverage.

Industry leverage, which is often considered a 'hold-all variable' that subsumes correlated but otherwise omitted variables such as competition, heterogeneity in the type of assets, business risk, technology or regulation, is significant in both sub-periods as well as the full sample period. It is noteworthy that the sign of the coefficient has reversed in the post-financial crisis period, although given the diversity of the factors listed above, any strong interpretation may be erroneous.

Macroeconomic factors

For the sample consisting of all the EMEs, domestic GDP growth is an important determinant of corporate leverage, both before and after the GFC, with a positive sign, which is consistent with the hypothesis that corporate leverage is pro-cyclical. On the other hand, it is interesting that changes in the FCI, the coefficient of which was statistically not significant in the pre-crisis period, turned significant in the post-crisis period and with a negative sign of the coefficient. This crucial result shows that changes in financial conditions were immaterial to corporate leverage decisions in the pre-crisis period but influenced capital structure in the post-crisis period.

The result that lagged world GDP growth is an important determinant of leverage in the pre-crisis as well as the post-crisis period is also along expected lines. The coefficient of changes in the Fed shadow rate, which was statistically not significant in the pre-crisis period, turned significant in the post-crisis period, with a negative sign. This crucial result suggests that the historically low global interest rates created an environment that encouraged corporates to raise more debt.

Sample excluding China

We recognise that Chinese firms face certain domestic macroeconomic conditions that are likely to bias our results. For example, even though the People's Bank of China (PoBC) recently liberalised interest rates, they were maintained artificially below market rates for a long time (The Economist, 2015). Directed credit was also part of the policy framework before the recent liberalisation measures. Thus the impact of changed macroeconomic, especially global, condition may not be transmitted fully to the Chinese corporates' balance sheets. Since our sample is dominated by Chinese firms (out of the sample of 2,331 firms, 1,305 firms are Chinese), an analysis of the sample excluding China is carried out (Table 5). This analysis reveals three significant results that are different from the 'all EMEs' sample.

First, while in the 'all EMEs' sample, profitability was a significant determinant across all the sub-periods, in the 'excluding China' sample it emerges as a significant determinant only in the post-crisis period. Second, while market-to-book value ratio was an important determinant of corporate leverage in both sub-samples in 'all EMEs', it is a statistically significant determinant only in the post-crisis period for the 'excluding China' sample. Third, the 'excluding China' sample results suggest that global macroeconomic factors, *viz.*, world GDP growth and the Fed shadow rate, emerge as statistically significant only in the post-crisis phase. This is different from the 'all EMEs' sample, where only the Fed shadow rate turned statistically significant in the post-crisis period.

The analysis of the 'excluding China' sample thus reinforces the hypothesis that global macroeconomic variables, which were not significant determinants of corporate leverage in the pre-crisis period, turned out to be influential determinants in the post-crisis period.

Generalised Method of Moments (GMM)

Recognising that application of OLS on dynamic panel models may yield biased and inconsistent estimators, we also employed the GMM proposed by Arellano and Bond (1991) (Table 6). This exercise also emphasises the importance of firm-specific factors such as firm size, industry level of leverage and lagged leverage. More importantly, global macroeconomic factors, *viz.*, world GDP growth and changes in the Fed shadow rate, emerged as significant determinants of EME corporate leverage in the post-financial crisis period.

Quantile Regression

In order to evaluate whether macroeconomic changes after the GFC affected firms at different levels of corporate leverage differently, quantile regressions are used (Table 7). While the overall result is in line with the results presented earlier, one striking result is that in the post-crisis period, the changes in Fed shadow rate affected firms at different corporate leverage levels, differently. In particular, low Fed shadow rate resulted in more corporate leverage for the lowest quantile firms. This implies that firms which are less leveraged benefitted most due to the lower global interest rate regime and helped them in increasing their leverage. In contrast, firms in the highest quantile seem to have reduced their leverage.

Small firms versus large firms

We examined whether small firms and large firms differ in their responses to the GFC. Within our sample of 'excluding China', which consists of firms with an asset size of more than US$ one billion, we segregate firms based on their asset size; firms with an asset size greater than the median are classified as 'large', while firms with an asset size less than the median are classified as 'small'. The analysis reveals significant differences in leverage determinants for large and small firms (Table 8).

While earlier results suggest that more profitable corporates tend to be less leveraged, the present bifurcation between small and large firms sheds further light on this point. The coefficient of profitability is significant only for large firms in the post-crisis period; the negative sign implies that in the post-financial crisis period large corporates with less profitability increased their corporate leverage. In the post-financial crisis period, as profitability of corporates declined, their retained earnings

also shrank. Larger firms, which in normal circumstances have access to greater retained earnings, found themselves in an environment characterised by less retained earnings but low cost of external funding and availability of abundant liquidity. Our results suggest that these pull and push factors may have together resulted in the higher leverage of large corporates.

In the case of small firms, our results indicate that leverage build-up was higher for firms with lower tangible assets but higher growth potential in the post-crisis period, while these factors were not influential in the pre-crisis period. More importantly, in the case of small firms, the coefficients of world GDP growth and the Fed shadow rate are statistically significant only in the post-financial crisis period, which indicates the influence of global developments on small firms in the post-crisis period. The GMM results for this exercise are reported in Table 9.

As a robustness check, we also employed the larger model individually on each country for the period 1996-2014 (Table 10). The model generally fits well, with the exception of Indonesia and Malaysia. The results highlight cross-country differences in the drivers of corporate leverage. In case of India, most of the domestic factors (excluding profitability, firm-size and credit-GDP ratio) and global factors turned out to be significant in explaining corporate leverage.

VII. Conclusions

This paper counters the mainstream view that firm level factors are of pivotal importance as determinants of corporate leverage and presents evidence that the changed macroeconomic scenario led to the sharp rise in corporate leverage in EMEs in the post-crisis period. This set of macroeconomic factors include international factors, such as global GDP growth and Fed policy, which are often considered exogenous to an EME, highlighting the possibility of global financial spillovers to EMEs through the corporate leverage route in the post-crisis period.

We use a variety of panel data models and quantile analysis, which suggest that large but less profitable firms have raised more resources from the debt market in the post-crisis period. This could be because of the fact that post crisis period was characterised by abundant global liquidity and search for yield, which possibly resulted in lenient credit-score evaluations and leverage built-up. It is also possible that these firms with low profit took advantage of their possible future upturn and borrowed cheaply from debt markets.

This apparently innocuous outcomes of quantitative easing, in absence of a concomitant increase in investment levels, disguises a possibility of financial distress as it points towards possible non-productive use of these borrowed funds. Moreover,

the result implies that the prolonged low interest rate regime as a pull factor behind the build-up of corporate leverage which suggests the possibility that leveraged assets may turn toxic with the change in policy rate cycle.

On the policy front we, therefore, emphasise on the key findings of increased leverage by large but less profitable corporates, questionable end-usage and pre-dominance of exogenous global factors in determining corporate debt in EMEs in the post-crisis period. In the face of interest rate and un-hedged currency risks, issues relating to the servicing of debt can quickly snowball into a systemic financial stability concern. Against the backdrop of recent history, which showed that the deleveraging process is almost always lengthy, costly and painful, the challenges for policymakers include ring-fencing their financial sector from possible effects of the deleveraging process.

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Table 1:Country Specific Variables Used in Construction of FCI

Country	Bond Market	Money Market	Stock Market
Indonesia	Debt GDP Ratio	Call rate-1 month Interest spread Real interest rate Money market rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
Thailand	Debt GDP Ratio G-Sec yield	Interest spread Real interest rate Money market rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
South Africa	Debt GDP Ratio G-Sec yield 10 years	Interest spread Real interest rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
Russia	Debt GDP Ratio Long term G-sec yield	Interest spread Real interest rate Money market rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
Philippines	Debt GDP Ratio Long term G-sec yield	Call rate Interest spread Real interest rate Money market rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
Mexico	Debt GDP Ratio G-Sec yield 10 years	Interest spread Real interest rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
Malaysia	Debt GDP Ratio G-Sec yield 10 years		Stock traded to GDP ratio Market cap. to GDP ratio Equity return
India	G-Sec yield 10 years	Call rate Real interest rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
China		Interest spread Real interest rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return
Brazil	Debt GDP Ratio	Interest spread Money market rate	Stock traded to GDP ratio Market cap. to GDP ratio Equity return

Data source: CEIC data

Table 2: Expected Signs of Determinants of Leverage

Determinants of Leverage	Expected sign	Previous Literature
Firm-level factors		
Lagged leverage	Positive/negative	Gungoraydinoglu and Oztekin (2011), Hovakimian and Titman (2006), Frank and Goyal (2009)
Profitability	Positive/negative	Haas and Peeters (2006), Rajan and Zingales (1995)
Tangibility	Positive/negative	Rajan and Zingales (1995), Haas and Peeters (2006)
Market-to-Book value	Positive/negative	Haas and Peeters (2006), Frank and Goyal (2009)
Firm Size	Positive/negative	Gungoraydinoglu and Oztekin (2011), Almeida and Campello (2007).
Industry Leverage	Positive/negative	Frank and Goyal (2009)
Macroeconomic Factors		
Domestic/ World GDP	Positive/negative	Frank and Goyal (2009), Gungoraydinoglu and Oztekin (2011), Oztekin and Flannery (2012)
Fed shadow rate	Negative	Gray and Stone (1999), IMF (2015)
Domestic Financing Conditions		
FCI	Negative	Not explored in earlier literature

Table 3: Definitions and Data Sources

Variable	Indicators	Definition	Source
Firm-specific variables			
Leverage	• Debt to equity • Debt to capital • Liabilities to asset • Debt to Earnings	1) Ratio of total debt to equity 2) Total Debt/ (Total Preferred Equity + Total Common Equity + Total Debt+ Minority Interest, Total (Incl. Fin. Div)) 3) (Total Current Liabilities + Total Long-Term Liabilities)/Total Assets 4) Total Debt/EBITDA	S&P Capital IQ
Profitability	• Return on assets • Return on Equity	1) EBIT/Average of current and previous year's assets 2) Net income divided by shareholders' equity	S&P Capital IQ
Market-to-book value		Sum of market value of equity and book value of debt divided by book value of assets	S&P Capital IQ
Asset size	Size by total assets	Total assets in logs in 2014	S&P Capital IQ
Tangibility	Tangible assets to total assets	Net Property, Plant & Equipment/ Total assets	S&P Capital IQ
Industry leverage		Mean of current years' leverage for all the firms in that particular industry	S&P Capital IQ
Country-Specific Macroeconomic Variables			
Domestic GDP Growth	GDP growth	Annual growth in GDP at constant market prices	World Bank
Global Macroeconomic Variables			
Fed Shadow rate	Fed shadow rate and effective Fed rate	Wu-Xi Fed shadow rate since January 2009. Effective Fed Fund rate prior to that.	Board of Governors of the Federal Reserve System, and Wu and Xia (2015)
World growth rate			IMF, World Economic Outlook

Table 4: Descriptive Statistics

	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis
Industry Leverage	5.12	4.40	21.50	0.90	3.36	3.04	13.93
Debt to Earnings	3.98	2.48	17.10	0.00	4.46	1.63	5.06
FCI	-0.2	-0.54	15.65	-10	2.89	0.19	6.23
Domestic GDP Growth	6.99	7.75	14.16	-13.13	3.72	-0.95	5.03
Fed Shadow Rate	2.34	1.88	6.35	-2.74	2.89	-0.18	1.62
Asset	8803.76	2437.40	904535.60	1000.90	34172.47	14.84	302.95
Tangibility	38.88	36.90	109.93	0.00	23.92	0.25	2.10
Market to book ratio	0.36	0.78	1.26	-7750	52.56	-147.35	21728.86
World GDP Growth	3.83	3.93	5.70	0.03	1.32	-0.93	4.35

Table 5: Drivers of Corporate Leverage in EMEs
Dependent variable: Debt Earnings Ratio-Panel with time effect

	1996-2014		1996-2007		2009-2014	
	EMEs	EMEs (excl. China)	EMEs	EMEs (excl. China)	EMEs	EMEs (excl. China)
Lagged leverage	0.692***	0.682***	0.638***	0.657***	0.603***	0.617***
	(0.006)	(0.009)	(0.009)	(0.013)	(0.01)	(0.014)
Profitability (-1)	-0.012***	-0.004**	-0.007***	-0.002	-0.042***	-0.013**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.01)	(0.006)
Tangibility (-1)	-0.004***	-0.006***	-0.008***	-0.006***	-0.001	-0.007***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.00)	(0.002)
Market-to-book value (-1)	0.094***	0.035	0.057***	0.020	0.828***	0.619*
	(0.025)	(0.022)	(0.022)	(0.023)	(0.27)	(0.331)
Firm size (-1)	0.034***	0.046**	-0.020	0.044	0.098***	0.031
	(0.015)	(0.022)	(0.024)	(0.033)	(0.03)	(0.043)
Industry leverage (-1)	0.033***	0.083***	0.052***	0.072*	0.019***	0.025**
	(0.008)	(0.011)	(0.028)	(0.040)	(0.01)	(0.012)
Domestic GDP Growth (-1)	0.053***	0.036***	0.032***	0.018	0.066***	0.028
	(0.007)	(0.012)	(0.010)	(0.017)	(0.01)	(0.021)
Change in FCI	-0.072***	-0.023*	-0.008	-0.023	-0.246***	-0.042
	(0.011)	(0.013)	(0.013)	(0.015)	(0.03)	(0.034)
World GDP Growth (-1)	0.074***	0.040	0.078***	0.030	0.180***	0.109*
	(0.017)	(0.026)	(0.038)	(0.055)	(0.03)	(0.041)
Changes in Fed Shadow Rate	-0.323***	-0.037**	-0.035	-0.042	-0.393***	-0.254***
	(0.012)	(0.017)	(0.025)	(0.035)	(0.04)	(0.043)
Adjusted R-squared	0.51	0.489	0.422	0.461	0.436	0.419
LM test statistics	0.24		0.75		1.300	
Breakpoint test F stat at 2008	2.92***					

Note: 1) The regressions include unreported interaction terms as well as year & country dummies.

2) The standard errors are reported in parentheses below the coefficient estimates

3) ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 6: Drivers of Corporate Leverage in EMEs Dependent variable: Debt-Earnings Ratio-GMM

	1996-2014		1996-2007		2009-2014	
	EMEs	EMEs (excl. China)	EMEs	EMEs (excl. China)	EMEs	EMEs (excl. China)
Lagged leverage	0.944***	1.029***	0.188	0.472*	0.802*	1.906
	(0.086)	(0.090)	(0.177)	(0.270)	(0.457)	(1.384)
Profitability (-1)	0.082	0.074	-0.097	-0.229	0.019	0.152
	(0.06)	(0.065)	(0.16)	(0.205)	(0.171)	(0.424)
Tangibility (-1)	0.005	0.007	-0.014***	0.000	0.004	-0.001
	(0.006)	(0.015)	(0.005)	(0.030)	(0.001)	(0.060)
Market-to-book value (-1)	-2.121	-2.327	0.608	7.893	-0.116	-9.831
	(2.403)	(7.952)	(0.571)	(5.631)	(2.75)	(12.515)
Firm size (-1)	-0.119***	-0.056	-0.346***	-0.273	-0.020	0.080
	(0.044)	(0.289)	(0.128)	(0.467)	(0.13)	(0.344)
Industry leverage (-1)	0.105***	0.078	0.664***	1.164	0.043	0.003
	(0.041)	(0.095)	(0.239)	(1.335)	(0.07)	(0.101)
Domestic GDP Growth (-1)	0.030*	-0.025	0.080***	1.120	0.049	-0.809
	(0.018)	(0.587)	(0.046)	(0.940)	(0.06)	(1.451)
Change in FCI	-0.250*	-0.080	-0.377***	0.339	-0.219***	0.886
	(0.153)	(0.150)	(0.103)	(0.312)	(0.09)	(1.918)
World GDP Growth (-1)	0.127***	-0.057	0.023	0.330	0.212***	0.922
	(0.039)	(0.456)	(0.110)	(0.635)	(0.06)	(1.668)
Changes in Fed Shadow Rate	-0.301***	0.242	-0.119	-0.958	-0.294***	0.150
	(0.138)	(0.550)	(0.106)	(0.614)	(0.08)	(0.621)
Sargan test p-val	0.38	0.406	0.28	0.417	0.42	0.427

Note:

1) The GMM estimates are based on the Arellano and Bond (1991) model.

2) The regressions include unreported interaction term as well as year and country dummies.

3) The standard errors are reported in parentheses below the coefficient estimates.

4) ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

5) The Sargan test reports the p-values for the null hypothesis that the instruments used are not correlated with the residuals.

Table 7: Quantile Regression Results-EMEs Except China Dependent Variable: Debt-Earnings Ratio

	1996-2014			1996-2007			2009-2014		
	25th %tile	Median	75th %tile	25th %tile	Median	75th %tile	25th %tile	Median	75th %tile
Lagged Leverage	0.61***	0.84***	0.97***	0.57***	0.80***	0.98***	0.54***	0.82***	0.95***
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)	(0.01)
Profitability (-1)	0.00	0.00	0.00***	0.00	0.00	0.00***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibility(-1)	0.00	0.00***	0.00***	0.00	0.00	0.00	0.00***	0.00**	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market to book value ratio (-1)	0.01	0.00	0.01***	0.00***	0.00	0.01***	0.64***	0.41***	0.29
	(0.61)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.16)	(0.14)	(0.20)
Firm size	0.07***	0.05***	0.00	0.04***	0.04***	-0.01	0.10***	0.03*	-0.04
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Industry Leverage	0.03***	0.05***	0.06***	0.02	0.03***	0.03	0.00	0.02***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)
Domestic GDP Growth (-1)	0.00	0.01***	0.01	0.00	0.00	0.01	0.01	0.02***	0.01
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Changes in FCI	0.00	-0.01	-0.02***	0.00	-0.01	-0.02***	-0.02	-0.01	0.00
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)
World GDP Growth (-1)	0.02***	0.02***	0.04***	0.01	0.06***	0.03	0.05***	0.04***	0.06**
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)	(0.01)	(0.02)
Changes in Fed Shadow Rate	-0.04***	-0.03***	0.00	-0.01	-0.02*	-0.03	-0.38***	-0.15***	0.25***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.05)	(0.04)	(0.06)
Pseudo R-squared	0.33	0.42	0.45	0.31	0.40	0.43	0.26	0.36	0.41
No. of Obs	7006	7006	7006	3206	3206	3206	3196	3196	3196

Note: 1) The regressions include unreported interaction terms as well as year & country dummies.
2) The standard errors are reported in parentheses below the coefficient estimates
3)***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 8: Drivers of Corporate Leverage in EMEs excluding China Dependent Variable: Debt-Earnings Ratio Panel with time effect

Variable	1996-2014		1996-2007		2009-14	
	Firms		Firms		Firms	
	Large	Small	Large	Small	Large	Small
Lagged Leverage	0.657***	0.692***	0.647***	0.654***	0.586***	0.621***
	(0.012)	(0.014)	(0.017)	(0.022)	(0.021)	(0.021)
Profitability (-1)	-0.003*	-0.022***	-0.002	-0.019	-0.046***	-0.005
	(0.002)	(0.007)	(0.002)	(0.013)	(0.012)	(0.007)
Tangibility (-1)	-0.008***	-0.004*	-0.007***	-0.004	-0.007***	-0.007**
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Market-to-book value ratio (-1)	0.121	0.138***	-0.153	0.125	0.213	0.811*
	(0.271)	(0.046)	(0.380)	(0.084)	(0.447)	(0.499)
Asset size	0.032	0.089*	0.033	0.064	-0.085	0.283**
	(0.029)	(0.048)	(0.044)	(0.072)	(0.061)	(0.123)
Industry Leverage	0.076***	0.083***	0.081	0.055	0.020	0.026
	(0.015)	(0.018)	(0.051)	(0.065)	(0.015)	(0.019)
Domestic GDP Growth (-1)	0.052***	0.024	0.026	0.007	0.060**	0.014
	(0.016)	(0.019)	(0.023)	(0.028)	(0.027)	(0.033)
Change in FCI	0.012	-0.030	0.019	-0.051*	0.014	0.007
	(0.018)	(0.026)	(0.020)	(0.031)	(0.039)	(0.061)
World GDP Growth (-1)	0.013	0.036	0.058	-0.039	0.079	0.118*
	(0.035)	(0.040)	(0.071)	(0.091)	(0.054)	(0.064)
Changes in Fed Shadow rate	-0.033	-0.050*	-0.086**	0.031	-0.203***	-0.303***
	(0.021)	(0.028)	(0.044)	(0.058)	(0.053)	(0.071)
Adjusted R-squared		0.513		0.474		0.423

Note: 1) The regressions include unreported interaction terms as well as year & country dummies.

2) The standard errors are reported in parentheses below the coefficient estimates

3)***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 9: Drivers of Corporate Leverage in EMEs excluding China Dependent Variable: Debt-Earnings Ratio-GMM

Variable	1996-2014		1996-2007		2009-14	
	Firms		Firms		Firms	
	Large	Small	Large	Large	Small	Large
Lagged Leverage	0.560	1.021***	0.728***	0.896***	0.193	1.700
	(5.773)	(0.085)	(0.199)	(0.141)	(0.619)	(1.749)
Profitability (-1)	-0.024	0.048	0.020	-0.012	-0.299	-0.219
	(2.182)	(0.117)	(0.057)	(0.090)	(0.336)	(0.769)
Tangibility (-1)	-0.016	0.005	0.006	0.055*	0.024	0.025
	(0.186)	(0.011)	(0.024)	(0.031)	(0.044)	(0.177)
Market-to-book value ratio (-1)	4.165	-3.461	-1.550	-0.277	8.891	-10.380
	(42.178)	(6.007)	(3.964)	(2.363)	(9.722)	(22.920)
Asset size	-0.601	-0.370	0.211	-0.077	0.006	1.189
	(6.284)	(0.958)	(0.291)	(0.281)	(0.402)	(10.323)
Industry Leverage	0.206	0.117	0.623	1.390	0.006	-0.067
	(1.721)	(0.157)	(1.105)	(1.380)	(0.080))	(0.203)
Domestic GDP Growth (-1)	-0.149	-0.302	-0.104	1.171**	0.489	0.514
	(5.289)	(0.791)	(0.595)	(0.603)	(0.710)	(2.386)
Change in FCI	0.160	0.123	0.183	0.015	-0.533	-0.408
	(2.391)	(0.454)	(0.289)	(0.304)	(0.804)	(1.985)
World GDP Growth (-1)	0.478	0.318	0.561	-0.245	-0.505	-0.826
	(9.249)	(0.593)	(0.537)	(0.479)	(0.821)	(1.186)
Changes in Fed Shadow rate	-0.021	0.358	-0.258	-1.232**	0.228	0.923
	(2.179)	(0.837)	(0.394)	(0.643)	(0.442)	(3.553)

Note:

1) The GMM estimates are based on the Arellano and Bond (1991) model.

2) The regressions include unreported interaction term as well as year and country dummies.

3) The standard errors are reported in parentheses below the coefficient estimates.

4) ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 10: Country Regressions Dependent variable:
Debt-Earnings Ratio 1996-2014

	Brazil	China	India	Indonesia	Malaysia	Mexico	Philippines	Russia	South Africa	Thailand
Book Leverage	0.215***	-0.104***	0.668***	-0.067	-0.199***	0.162***	-0.112***	-0.681***	-0.489***	-0.300***
	(0.004)	(0.021)	(0.009)	(0.144)	(0.050)	(0.001)	(0.015)	(0.041)	(0.071)	(0.042)
Profitability	0.155***	-0.413***	0.023	-0.224	0.635**	-0.064***	-0.017***	-0.133***	0.001	-0.051
	(0.010)	(0.040)	(0.072)	(0.634)	(0.384)	(0.006)	(0.005)	(0.016)	(0.032)	(0.065)
Tangibility	0.037***	-0.059***	0.187***	-0.044	0.199	0.023***	-0.035***	-0.048***	-0.014	-0.017
	(0.003)	(0.008)	(0.015)	(0.398)	(0.183)	(0.002)	(0.007)	(0.009)	(0.014)	(0.041)
Market-to-Book Value	-0.791***	-0.792***	0.695***	34.005	0.731	0.110***	-0.823	0.960***	0.769***	-0.875
	(0.107)	(0.204)	(2.274)	(45.032)	(0.650)	(0.045)	(0.522)	(1.156)	(1.922)	(2.161)
Firm Size	0.859***	0.426***	-0.571	0.696	-0.361	0.844***	0.282*	0.150	0.448***	0.908***
	(0.138)	(0.315)	(0.019)	(7.096)	(0.413)	(0.033)	(0.157)	(0.204)	(0.640)	(0.975)
Domestic GDP Growth	0.110	0.539**	-0.060***	-38.878	-0.031	-0.021***	-0.032	-0.173	-0.837	0.966
	(0.190)	(3.203)	(0.085)	(164.884)	(0.057)	(0.007)	(0.025)	(0.804)	(7.504)	(2.773)
Inflation	-0.279	-0.530***	0.700***	-0.547	0.044	0.065***	0.168***	0.950***	-0.755	-0.276
	(0.281)	(1.970)	(0.142)	(14.271)	(0.491)	(0.004)	(0.021)	(0.709)	(8.113)	(6.280)
Credit GDP Ratio	0.092	-0.155	-0.139	-3.522	-0.563	-0.016***	-0.011	-0.135	0.098	0.271
	(0.070)	(0.182)	(0.043)	(9.855)	(0.409)	(0.003)	(0.012)	(0.308)	(1.342)	(2.954)
Government Debt GDP	-0.282**	0.564***	-0.083**	3.819	0.908	0.069***	0.002	-0.605	0.512	-0.433
	(0.150)	(1.965)	(0.014)	(6.560)	(2.807)	(0.003)	(0.008)	(0.403)	(3.353)	(7.563)
Value Traded GDP Ratio	-0.287**	-0.045**	-0.092***	-3.132	-0.197	0.055***	-0.004	-0.605***	-0.003	0.930
	(0.018)	(0.026)	(0.051)	(18.283)	(0.359)	(0.003)	(0.033)	(0.211)	(1.378)	(4.515)
World GDP Growth	0.017	0.325***	-0.142***	7.577	1.327	0.082***	0.012	-0.598	0.308	-0.966
	(0.179)	(0.484)	(0.052)	(62.492)	(3.546)	(0.016)	(0.022)	(1.552)	(5.462)	(5.071)
Fed Shadow Rate	0.418***	-0.909	0.122**	-10.347	-0.224	0.118***	0.056	-0.095	0.165	0.353
	(0.123)	(0.728)	(0.686)	(21.019)	(4.513)	(0.005)	(0.029)	(0.701)	(2.504)	(3.599)
No. of Observations	1,565	8,207	168	579	555	787	331	778	561	544
Sargan Test	0.20	0.40	0.2	0.90	0.88	0.44	0.71	0.98	0.74	0.54
m-value AR(1)	-1.46*	-4.39***	-1.72**	-9.16***	-11.12***	-1.55*	-2.03***	-5.19***	-2.98***	-1.85***
m-value AR(2)	-0.90	-0.44	-1.16	-3.56***	-2.86**	-1.11	-1.24	1.45	-1.32	-0.41

The estimates are based on Arellano and Bond (1991) GMM model. The regressions include unreported interaction term as well as year dummies. The standard errors are reported in parenthesis below the coefficient estimates. ***, ** and * indicate significance at the 1%, 5% and 10% levels. AR(1) and AR(2) denote the P-values for the first and second order autocorrelation in the residuals. Sargan test reports the p-values for the null hypothesis that the instruments used are not correlated with the residuals.