EVALAUTING THE IMPACT OF RISING EMERGING MARKET CORPORATE DEBT

Wing Chan Lazaridis School of Business & Economics Wilfrid Laurier University (519)-884-0710 (ext: 3650) wchan@wlu.ca	Olga Dodd Auckland University of Technology Auckland, New Zealand olga.dodd@aut.ac.nz	Madhu Kalimipalli* Lazaridis School of Business & Economics Wilfrid Laurier University (519)-884-0710 (ext: 2187) mkalimipalli@wlu.ca

(Version dated Sept 25, 2017)

[Preliminary and work in progress]

Abstract

In this paper, we investigate how increased corporate leverage of emerging market firms in the post-crisis period impacted the underlying credit risk. We conduct a comprehensive study of how escalating emerging market corporate debt can impact distress risk for issuing firms. Using a firm-level credit risk, financial and balance sheet data of 350 firms from 23 emerging markets over an extended period 2002-15, we show that in the post-crisis (2010-2015) period, higher leverage significantly increases the PD of the firms; and lowers the DTD. The incremental leverage effects are most prominent in the Asian and Latin American region firms. Our results remain robust to endogeneity correction and alternate regression methodologies. We also explore and document possible firm- industry and country based risk channels through which higher leverage can impact credit risk in emerging markets.

Keywords: emerging markets, corporate debt, distress risk, post-financial crisis

JEL Classification: G10, G14 G15, G30.

*Kalimipalli is the corresponding author.

For presentation at Auckland Finance Conference, Queenstown, Dec 2017; and IGIDR Emerging Market Conference, Mumbai, Dec 2017.

EVALAUTING THE IMPACT OF RISING EMERGING MARKET CORPORATE DEBT

1. INTRODUCTION

Emerging market economies accounted for less than a third of global economy in 1990, but by 2013, they grew to roughly half of world's GDP, or almost 60% in terms of purchasing-power parity, in what could be "the biggest economic transformation in modern history."[1] The period 1999-2007 was marked by strengthening balance sheets of emerging economies due to a combination of current account surpluses, a shift from debt funding to equity funding, and the stockpiling of liquid foreign reserves.

Starting in 2007, however, there were significant reversals as emerging economies accumulated significant external debt, and non-financial corporations from emerging markets increased their external borrowing significantly through the offshore issuance of debt securities.[2] For example, emerging market corporate loans and debt rose from 73% of GDP at the end of 2007 to 107% of GDP by the end of 2014.[3] Between 2009 and 2014 the dollar denominated debts of the developing world, in the form of both bank loans and bonds, more than doubled, from around $2 trillion to some $4.5 trillion (Source: Bank for International Settlements or BIS).[4]

In this paper, we investigate the potential fallout from the increased corporate leverage in emerging market firms. In particular, we study if increasing corporate leverage during the post-financial crisis period affected *firm level distress* in emerging markets. We conduct a comprehensive study of how escalating emerging market corporate debt can impact distress risk for issuing firms. The impact of growing leverage was influenced by commodity price slump and local currency

[1] Source: Economist, July 27, 2013.

[2] See for e.g., Acharya et al., (2015), Shin (2013) and Avdjiev, Chui, and Shin (2014).

[3] Including the credit extended by non-bank financial institutions, or "shadow banks", there was even steeper rise and a higher total burden amounting to 127% of GDP (source: Economist, Nov 14, 2015). Overall the corporate debt of nonfinancial firms across major emerging market economies quadrupled between 2004 and 2014 (IMF document: corporate leverage in emerging markets—a concern? October, 2015).

[4] In addition, there is growing currency mismatch. For e.g., China has almost 25% of its corporate debt that is dollar denominated, but only 8.5% of its corporate earnings that are generated in dollar terms. Worse, this debt is highly concentrated, according to Morgan Stanley, with 5% of firms holding 50% of debt (Source: "The mighty dollar Feeling green" Economist, 3/21/2015). Corporate defaults in China have been rising in the face of increased leverage of Chinese firms; see "China's corporate bonds so murky for many investors" Wall Street Journal (6/16/2016).

depreciation. Increasing foreign currency denominated debt along with weakening local currency accompanied by dimmed global market outlook can increase the debt burden for the underlying issuers, exacerbating their default risks. Higher distress risk can also depresses the stock prices by inflating the latent risk premia. Overall our work contributes to the literature on emerging market debt and helps shed light on the ramifications of exploding emerging market debt on underlying credit risk.

Growing corporate leverage while can facilitate higher corporate investment and perhaps stimulate growth, can eventually lead to higher borrower's interest rate, rollover and currency risks. If the markets were to experience exogenous exchange rate and/or interest rate shocks, stress on corporate balance sheets could rapidly spill over into other sectors, further exacerbated though powerful feedback loops, inflicting losses on the corporate debt holdings of global asset managers, banks and other financial institutions.

Previous literature has documented the increasing leverage in emerging markets. IMF Global Financial Stability report (2015, Chapter 3), documents three key findings: First, the relative contributions of firm- and country-specific characteristics in explaining leverage growth, issuance, and spreads in emerging markets seem to have diminished in recent years, with global drivers playing a larger role. Second, leverage has risen more in more cyclical sectors, and it has grown most in construction. Higher leverage has also been associated with, on average, rising foreign currency exposures. Third, despite weaker balance sheets, emerging market firms have managed to issue bonds at better terms (lower yields and longer maturities), with many issuers taking advantage of favorable financial conditions to refinance their debt.

Explosion of emerging market corporate borrowings was marked by two concurrent macro-economic developments: (1) Quantitative Easing (QE) reversal in U.S. since 2013 and consequent "taper-tantrums" have been fraught with excessive capital outflows out of emerging markets, adversely impacting their local exchange and inflation rates, and causing considerable speculation that a tightening of dollar-funding conditions and a macroeconomic slowdown in emerging economies may lead to financial instability in other emerging economies. (2) Recent commodity price drops since 2015 continue to plague several emerging market commodity exporters causing

local currency depreciation and strain on foreign debt servicing by emerging market firms, with potential repercussions on firm-level and sovereign distress and credit risks.

Overall we document the following findings:

- We observe a secular trending up year to year of the corporate leverage in the post-crisis (i.e. 2010-15) period. At the same time we witness a drop in several key financial performance variables of the firms including return on sales (ROS), return on assets (ROA), Q ratio, and price to book (PTBV) and interest coverage ratios in the post-crisis period.
- While the CDS spread dropped significantly post-crisis it went up again in year 2012 and thereafter fell for next two years until going up slightly in year 2015. DTD follows the analogous trend in the opposite direction, where a drop in DTD indicates heightened distress risk. On the other hand, the 12 month- PD measure registered a secular increase in the post-crisis period with only a small drop in year 2014.
- Latin American and EMEA region firms have higher leverage ratios compared to Asian forms. EMEA firms have higher CDS and DTD levels compared to Asian and Latin American regions.
- The highest leverage quartile firms in general have highest credit risks (measured as CDS spreads, CDS volatility, PD, DTD, equity volatility and skewness) and lowest liquidity (measured as CDS depth). Comparing pre-, during and post- crisis periods, we see that highest credit and liquidity risk measures prevail only during the crisis period. Bivariate sorts based on leverage and idiosyncratic volatility show that interestingly the post-crisis period is also characterized by high credit measures compared to the crisis period for the low risk portfolios.
- Panel data regressions show that post-crisis increase in leverage has significant impact on DTD (level) and PD (first differences or changes), and the effects are mostly found for Asian (both PD and DTD changes) and Latin America (PD changes) firms. Regressions based on principal components show that, in the post crisis period, higher leverage significantly increases the PD of the firms; and lowers the DTD. The incremental leverage effects are most prominent in the Asian region firms. Similar analysis for DTD shows that leverage extension in the post-crisis period has the highest impact on DTD for Asian firms.

Pooled data (i.e. cross sectional averages of time series regressions) show that incremental leverage in the post-crisis period significantly impacts PD measure for Latin America.

- Our results remain robust to endogeneity correction and alternate regression methodologies.
- We also explore the firm- industry and country based risk channels through which higher leverage can impact credit risk in emerging markets. We observe that firm specific variables such as larger size and higher q ratio, signifying high growth prospects, can significantly lower the leverage effect on credit risk. Effect of higher leverage on credit risk is also significantly higher for tradable industry firms, and remain robust in all three geographic regions. For firms in countries experiencing higher capital flows effect of leverage on credit risk is much lower. On the contrary, for firms in countries laden with high external debt, effect of leverage on credit risk is significantly higher. Finally, for firms in countries with better governance effect of leverage on credit risk is significantly lower.

Our analysis and discussion proceeds as follows: Section 2 provides a review of related work; Section 3 together with Appendices A, B and C describe the data; and Section 4 presents the baseline panel data model and results. Section 5 presents the robustness checks; Section 6 explore the risk channels through which higher leverage can impact credit risk in emerging markets; Section 7 concludes.

2. BACKGROUND LITERATURE

Our paper contributes the recent literature on the effects of burgeoning corporate leverage in emerging markets on the aggregate and firm-level risks. In particular we contribute to three stands of literature summarized below.

2.1 Increasing emerging market corporate leverage

Mizen et al. (2012) examine the choice between onshore and offshore corporate bond issuance in eight Asian emerging countries over the period 1995-2007. They report that over time the proportion of issues and the relative quantity of issuing in the onshore market have increased significantly mainly due to the increased depth of the onshore markets.

Shin (2013) shows that offshore issuance of corporate bonds in foreign currency has resulted in currency mismatch on the consolidated balance sheets of emerging market firms. Accompanying the offshore issuance has been the growth in corporate deposits in the domestic banking system that are vulnerable to withdrawal in the event of corporate distress. Shin documents that the growing stock of emerging market corporate debt securities has been absorbed by asset managers whose main reason for buying them has been the perception of stronger economic fundamentals of emerging markets.

Avdjiev, Chui and Shin (2014) document that non-financial corporations from emerging market economies have increased their external borrowing significantly through the offshore issuance of debt securities. Having obtained funds abroad, the foreign affiliate of a non-financial corporation normally transfer funds to its home country via three channels: it could lend directly to its headquarters (within company flows), extend credit to unrelated companies (between-company flows) or make across-border deposit in a bank (corporate deposit flows). The authors find that cross-border capital flows to emerging markets associated with all three of the above channels have grown considerably over the past few years. To the extent that these flows are driven by financial operations rather than real activities, they could give rise to financial stability concerns.

Chui, Fender and Sushko (2014) argue that while emerging market non-financial corporations increased leverage and overseas borrowing in response to low interest rates, it inevitably increases the borrower's interest rate, rollover and currency risks. Furthermore, some emerging market corporations may have used borrowed funds for purely financial (i.e., speculative) purposes. In other cases, these external positions may be inadequately hedged, whether through natural offsets or by the use of financial instruments.

Turner (2014) argues that the global long-term interest rate now matters much more for the monetary policy choices facing emerging market economies than a decade ago. The low or negative term premium in the yield curve in the advanced economies from mid-2010 has pushed international investors into emerging local bond markets: by lowering local long rates, this has considerably eased monetary conditions in the emerging markets. It has also encouraged much increased foreign currency borrowing in international bond markets by emerging market

corporations, much of it by affiliates offshore. These developments strengthen the feedback effects between bond and foreign exchange markets. They also have significant implications for local banking systems.

Feyen, Ghosh, Kibuuka, and Farazi (2015) document the unprecedented post-crisis bond issuance surge in emerging markets. They find that global factors matter greatly for emerging and developing economies issuance. Their findings suggest that although issuers might be able to benefit from benign international funding conditions, the large issuance volumes, currency risks, and high exposure to global factors could pose external and domestic challenges for policy makers, particularly when global cycles reverse.

Ayala, Nedeljkovic, and Saborowski (2015) show that while institutions and macro fundamentals explain emerging market non-financial corporate debt issuance in normal times, during the post-financial crisis period, however, global cyclical factors and search for yield accounted for the growth in the firm leverage.

McCauley, McGuire, and Sushko (2015) profile the USD denominated debt in 12 emerging countries. They report a significant growth in USD credit and a variety of forms and channels used across countries, which leads to different vulnerabilities.

Tillmann (2016) finds that QE has significant spillover effects on emerging market financial conditions and plays a sizable role in explaining capital inflows, equity prices and exchange rates.

Chui, Kuruc and Turner (2016) show that it was not only companies providing tradable goods and services but also those producing non-tradable goods which have increased their foreign currency borrowing. The authors show that the across the-board decline in emerging market companies' profitability since mid-2014 has brought to light significant vulnerabilities that may aggravate market volatility.

Bruno and Shin (2017) examine the determinants of US dollar bond (issuance activities by non-US corporations from 47 countries over 2002-2014 period. They find that EM firms tend to borrow

more in USD when they hold large cash balances in local currency; bond issuance is more prevalent when the USD carry trade is more favourable in terms of appreciating local currency, high interest differential and low exchange rate volatility.

Chow (2015) discusses the cross-country trends in EM corporate debt and leverage, and how increased borrowing, particularly in foreign currency, increases firms' vulnerability to interest rate, exchange rate and earnings shocks.

Gourinchas and Obstfeld (2012) argue that buildup of domestic and external leverage and real currency appreciation are the main predictors of financial crises, both for emerging and advanced countries.

2.2 Implicit risks in emerging market corporate debt [5]

Min et al. (2003) examine the determinants of USD denominated bonds in 11 emerging countries over the period 1991-1999. They report that liquidity and solvency variables, U.S. interest rates, and macroeconomic fundamentals are significant determinants of bond spreads.

Delikourasy, Dittmarz and Haitao (2016) show that foreign investors may overlook the influence of foreign exchange risk on the probability that emerging market corporations will default on their debt due to a currency mismatch between revenues and liability payments. The authors find that on average 35% of hazard rate variability can be attributed to changes in exchange rate volatility. Investors in dollar denominated emerging market bonds are substituting currency risk for default risk.

Zinna (2011) investigates systematic risk factors driving emerging market credit risk by jointly modeling sovereign and corporate credit spreads at a global level. They find that following the Lehman crisis , emerging market sovereign spreads decoupled from the U.S. corporate market while the corporate bond spreads widened in response to higher U.S. corporate default risk. Both

[5] Others have studied sovereign credit risk in merging markets Astad, Remonola and Shek (2016); Ismailescu and Kazemi (2010); Kennedy and Palerm (2014)

emerging sovereign and corporate bond spreads widened in flight-to-liquidity (measured as LIBOR minus OIS) episodes.

Timmer (2016) examines the impact of the U.S. monetary policy on corporate bond yields in emerging countries. They find that emerging corporate bond yields are positively associated with the federal funds rate. However, this positive relationship is transmitted through the domestic policy rate. They conclude that the main determinant of corporate bond yields in emerging countries is the domestic policy rate.

Tsai, Lu and Hung (2016) examine how newspaper articles and corporate filings affect credit risk. The sample includes CDS of U.S. companies over the period 2001-2013. They find that more news coverage and negative news sentiment increase credit risk. They argue that qualitative information published in newspapers and corporate filings contains information for the evaluation of the credit risk of the firms.

2.3 Emerging market capital flows and debt market

Eichengreen and Gupta (2014) study the U.S. taper tantrum episode and find that equity prices, exchange rates and foreign reserves tended to move together across countries, but the magnitudes of the movements depended on the size of the domestic financial market.

Cohen and Remolona (2008), analyze the compare price movements in Asian equity markets with price movements of US-based closed-end funds that invest in those markets Asian crisis of 1997. They find that U.S. market sentiment assumed a more important role in driving market movements in Asia during the crisis than in less stressful times.

Index tracking behavior by investors can also impact the global bond markets. Haldane (2014) has argued that in the world of international finance, the global subprime crisis and the regulations that followed made asset managers more important than banks. Miyajima and Shim (2014) show that even actively managed emerging market bond funds follow their benchmark portfolios quite closely. For the most part, when global investors invest in emerging markets, instead of picking and choosing based on country-specific fundamentals, they appear to simply replicate their

benchmark portfolios, the constituents of which hardly change over time.

Dornbusch (2001) puts forward propositions that summarize knowledge and evidence on emerging market crises and discusses presumptions about practices that will lead to a crisis.

Kumara, Moorthy and Perraudin (2003) show that crashes in emerging market currencies are predictable using simple logit models based on lagged macroeconomic and financial data, and substantial profits may be made.

Gourio, Siemer and Verdelhan (2015) show that in a large panel of 26 emerging countries over the last 40 years, stock market return volatilities forecast capital flows. When a country's stock market volatility increases, political risk goes up to, and that political risk significantly affects capital flows due to possible expropriation risk.

Rojas-Suarez (2015) examines the relative macroeconomic resilience across emerging market economies using an indicator based on two macro-economic dimensions (1) cost and availability of external financing (measured using three ratios: current account balance to GDP; total external debt to GDP; and short-term external debt to gross international reserves), and (2) country's fiscal and monetary position (measured as two ratios: general government fiscal balance to GDP and government debt to GDP; squared value of the deviation of inflation from its announced target, and financial fragility metric characterized by the presence of credit booms or busts) .

Tarashev, Avdjiev and Cohen (2016) analyse vulnerabilities of non-financial companies in emerging countries to capital flows. They conclude that international capital flows have contributed to the financial boom in emerging countries and will play an important role in the next phase of the emerging countries' financial cycles. Private sector borrowing and particularly offshore borrowing of non-financial companies has grown, increasing the vulnerability of the companies and financial conditions in the country.

In this paper, we conduct a firm level study of how increasing corporate leverage in emerging markets during the post-financial crisis period impacted the credit risk.

3. Data and Summary Statistics

We identify the list of emerging countries by combining the IMF's & MSCI's lists of emerging countries (see Appendix B for details). Out of the 28 emerging countries from the IMF's and MSCI's lists, 23 emerging countries have CDS data available in Markit database. From Datastream we obtain a comprehensive list of stocks publicly listed in these emerging markets. From this list, we exclude preference shares and other secondary types of shares issued by companies with the exception is China where we exclude A-shares and include B-shares and H-shares that are accessible to foreign investors. We obtain firm level- credit data from three different sources (1) CDS data from Markit, (2) Probability of default (PD) data and (3) Distance to default (DTD) data , where PD and DTD are sourced from from the Credit Risk Initiative (CRI) at the Risk Management Institute (RMI) of the National University of Singapore (NUS)- See Appendix C for details. Overall we have 350 firms from 23 emerging market countries with India and Taiwan accounting for 21% and 12% of the sample firms - See Table I for details.

[Insert Table I here]

Figure I shows the secular trending up year to year of the corporate leverage in the post-crisis (i.e. 2010-15) period. There is significant buildup of leverage post-crisis as evidenced in several leverage measures, particularly involving net debt to EBIT and net debt to market value of equity. At the same time we witness a drop in several key financial variables measuring the financial health of the firms including return on sales (ROS), return on assets (ROA), Q ratio, price to book (PTBV) and interest coverage ratios in the post-crisis period.

[Insert figure 1 here]

Table II reveals that Latin American and EMEA region firms have higher leverage ratios compared to Asian forms. There is wide heterogeneity in leverage by industry with Telecom and Utility firm having significantly high leverage while technology firm having lowest debt.

[Insert Table II here]

Figure III presents all the three credit measures benchmarked to the underlying aggregate leverage of the emerging market firms. While the CDS spreads dropped significantly post-crisis it went up again in year 2012 and thereafter fell for next two years until going up slightly in year 2015. DTD follows the analogous trend in the opposite direction i.e., the DTD went up post-crisis and dropped during year 2012 and again in year 2015, where a drop in DTD indicates heightened distress risk. On the other hand, the 12 month- PD measure registered a secular increase in the post-crisis period with a small drop in year 2014.

[Insert figure II here]

Table III shows that EMEA firms have higher CDS and DTD levels compared to Asian and Latin American regions. At the industry level, health care firms seem to have CDS and equity risks (i.e. firm level volatility and negative skewness), while financial sector firms seem to higher distress risk based on PD and DTD measures.

[Insert Table III here]

Table IV presents correlations variables for the underlying firms for all the emerging markets. The variables we report include balance sheet and financial variables in Panel A, and credit risk proxies (i.e. CDS spreads, PD and DTD), credit market (CDS depth) liquidity proxies, and equity market risks in Panel B. From Panel A, we find significantly positive correlations among leverage proxies. We find Q ratio is significantly correlated with price to book and return on assets. . From Panel B, we find that leverage is significantly related to all credit risk proxies i.e. CDS spread, PD, DTD and stock volatility. Leverage is also strongly related to PD term structure slope and negatively reacted CDS liquidity measures. Among credit risk proxies we see strong correlations among average and end-of- the month spread and liquidity values.

[Insert Table IV here]

4. EMPIRICAL TESTS

4.1. Univariate sorts

We first sort the firm leverage into quartiles each month and then report the average values of variables for the underlying firms for all the emerging markets using the data for the period 2002-15. The variables we report include balance sheet and financial variables in Table V, Panel A, and credit risk proxies (i.e. CDS spreads, PD and DTD) and equity market risks in Panel B. All the

variables are defined in Appendix A.

Panel A shows that high leverage quartile in general is associated with high debt levels, and lowest firm performance variables based on interest coverage, sales to assets, return on sales, return assets, market to book and q ratios. The firm performance variables worsen for high leverage firms in the post-crisis period compared to pre-and during- crisis periods. Panel B further shows that highest leverage quartile firms also have highest credit risks (measured as CDS spreads, CDS volatility, PD, DTD, equity volatility and skewness) and lowest liquidity (measured as CDS depth). Comparing pre-, during and post- crisis periods, we see that highest credit and liquidity risk measures prevail only during the crisis period.

[Insert Table V here]

4.2 Bivariate sorts

We next conduct bivariate sorting where we first sort the firm leverage into quartiles each month and then further sort each leverage quartile into four more quartiles based on the idiosyncratic volatility of the underlying firms for all the emerging markets using the data for the period 2002-15.We report the average value of each credit risk proxy i.e. CDS spreads, PD and DTD for each of the 4 X 4 bins. From Table VI we observe that intersection of two high risk quartiles i.e., 4th quartiles of leverage and idiosyncratic volatility produce firms that have the highest CDS spreads, PD values and lowest DTD measures, more so in the crisis period. Interestingly the post-crisis period is also characterized by high credit measures compared to the crisis period for the low risk portfolios (i.e. the interactions of the first two quartile portfolios).

[Insert Table VI here]

4.3 Panel data regression models

We conduct monthly panel regressions of credit risk proxies (in levels and changes) for all the emerging markets using the data for the period 2002-15. Results are presented in Table VII. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. Panel A presents the

results for the aggregate data while Panel B presents the regression results for the quartiles leverage groups. Each firm is assigned to a leverage group based on the firm's average leverage ratio for over the sample (e.g., Collin-Dufresne et al., (2001). All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations.

We observe from Panel A that post crisis increase in leverage has significant impact on DTD (level) and PD (first differences or changes). The leverage effect is significant after conditioning for underlying idiosyncratic volatility. There is no clear post crisis effect of volatility on credit risk. We also observe a significant role for market factors. There is a significant negative impact of market returns both local and US based S& P 500 index returns on credit risk. Elevated levels of risk aversion, credit and funding risk proxied respectively by US based VIX index, default and TED spreads significantly increase credit risk. Increase in US term structure slope also seem to increase distress risk sin emerging markets. Panel B shows that leverage post crisis has significant effect on changes in CDS spreads and PD measures in all leverage quartiles.

[Insert Table VII here]

5. Robustness Tests

5.1 Endogeneity correction

We first consider the possibility that firm leverage may be endogenously determined by the underlying firm based on credit risk, financial and balance sheet variables. We conduct Heckman correction applied to panel regressions in Table VII. We run the first stage probit regressions of leverage level (high=1; low=0) on several instrumental variables Sales to Assets ROA, Tobin's Q, all industry dummies, lagged CDS, lagged PD, lagged DTD. The high (or low) leverage is based on firm's debt being above (or below) on the firm's average leverage ratio for over the sample. We then use inverse Mills ratio (IMR) from the probit model as an additional independent variable in the second stage regression. Only the second stage regression results are reported in Table VIII. We employ the Heckman correction to credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15. The IMR variable is strongly

significant indicating that possibility of self-selection in leverage choice. We observe that incremental leverage in the post crisis period significantly increases PD (levels and changes) and decreases DTD (levels). Interestingly the increase on volatility has diminishing effect on credit risk measured through PD and DTD measures.

[Insert Table VIII here]

5.2 Alternate Estimation Methods

We next consider two alternate econometric approaches to studying the effects of leverage on credit risk.

5.2.1 Time-series regressions using Principal components of firm variables

We implement the monthly time-series regressions using three credit risk proxies i.e. CDS spreads, PD and DTD, in first differences or changes, for all the emerging markets using the data for the period 2002-15. We first extract principal component of each credit risk proxy and balance sheet variables of all firms for each country over time and use the first principal components as variables in the time-series regressions. Explanatory variables include principal components of leverage, volatility and other firm-specific characteristics; in addition to aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-country correlations.

Table IX shows that that leverage interaction effects are very significant for credit risk during the crisis. In the post crisis, however, higher leverage significantly increases the PD of the firms (at 10% level significance); the most significant impact (i.e., at 1 % level) is however on the DTD which goes down significantly for firms with higher leverage in the post-crisis period. The leverage interactions with post-crisis period are significant for PD and DTD measures even after controlling for higher idiosyncratic volatility of the firms.

[Insert Table IX here]

5.2.2 Cross-sectional averages of monthly time-series regressions

We also implement pooled regression approach by considering cross-sectional averages of monthly time-series regressions of each firm following Collin-Dufresne et al. (2001). Firm-specific time-series regression is conducting using three credit risk proxies i.e. CDS spreads, PD and DTD (in levels and changes) for all the emerging markets using the data for the period 2002-15. We then calculate cross-sectional average of time series coefficients across all firms. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. Table X, Panel A presents the results for the aggregate data while Panel B presents the regression results for the quartiles leverage groups. As before each firm is assigned to a leverage group based on the firm's average leverage ratio for over the sample. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. These t-statistics capture cross-sectional variation in the time-series regression coefficient estimates as in Collin-Dufresne et al. (2001).

We observe that leverage and firm level volatility variables standalone significantly impact credit risk. However we see no effect of incremental effects of leverage during- or post-crisis on any credit risk proxy either in level or changes regressions (Panel A, Table X), or regressions done using quartiles of leverage portfolio (Panel B).

[Insert Table X here]

5.3 Regional Effects

Wed also conduct the robustness checks of our results by implementing each of our regression methodologies on firms from countries grouped by each specific geographic region i.e. Asia, EMEA and Latin America (as defined in Appendix A)

Using the Panel data regressions, we observe in Table XI that post crisis increase in leverage has significant impact on DTD (level) and PD (first differences or changes) mainly for Asian (both PD and DTD changes) and Latin America (PD changes) firms. Using the regression based on factors drawn on principal component approach, we find in Table XII that the incremental effects of leverage on

PD are most prominent in the Asian region firms. Similar analysis for DTD shows that leverage extension in the post-crisis period has the highest impact on DTD for Asian firms. Finally using the cross- sectional averages approach we implement the subsample regressions for three separate regions and find in Table XIII that the incremental leverage in the post-crisis period significantly impacts PD measure for Latin America.

[Insert Tables XI, XII, and XIII here]

6. Evaluating channels though which corporate leverage impacts credit risk

Here we evaluate alternative firm specific and country based risk variables through which increase corporate leverage can underlying credit risk.

6.1 Effect of firm size on credit risk

We study the effect of firm size on how leverage impacts credit risk based on panel regressions in Table VII. We employ a triple interaction of leverage x post-crisis x large firm, where large firm dummy is set to 1 for the largest two quartiles of firm size; and zero otherwise. We employ credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15. Table XIV reports the results. We do not report all the control variables for brevity. We observe that leverage effect on credit risk in the post crisis period is significantly negative for larger firms, only for the PD measure.

[Insert Table XIV here]

6.2 Effect of growth factor (Q ratio) on credit risk

We study the effect of firm size on leverage-credit risk relationship based on panel regressions in Table VII. We employ a triple interaction of leverage x post-crisis x large q, where large q dummy is set to 1 for the largest two quartiles of q ratio; and zero otherwise. Once again we do not report all the control variables for brevity. We observe in Table XV that leverage effect on credit risk in the post-crisis period is significantly negative for higher growth prospect firms, only for the PD measure.

[Insert Table XV here]

6.3 Effect of Industry type on credit risk

We study the industry effects on impact of leverage on credit risk based on panel regressions in Table VII. We employ a triple interaction of leverage x post-crisis x industry type, where industry type is captured using two dummies: (a) finance dummy i.e.1 for all financial forms and zero otherwise; (b) tradable sector dummy i.e. 1 for tradable sector (Industrials, oil and gas, and Technology) and zero for non-tradable sectors (construction, transportation, communications, utilities, wholesale/retail trade, and services). Panel A, Table XVI, presents industry effects for the overall sample; while Panel B presents region specific industry effects.

We observe in Table XVI that industry effect mainly comes though tradable industry firms which export their goods and services externally. Such firms experience a higher impact of leverage on default risk measures as PD. Regional decomposition in panel B shows that for tradable industry firms, impact of high leverage on credit risk is strong in all three market regions i.e. Asia, EMEA and Latin America. We additionally find no incremental impact of leverage on credit risk for financial firms.

[Insert Table XVI here]

6.4 Effect of capital flows on credit risk

We next study the effect how the country specific variable i.e., capital flows impacts the leverage effect on credit risk. We employ a triple interaction of leverage x post-crisis x capital flows. Capital flows is captured using non-foreign direct investment net capital flow (non-fdi), which measures the monetary value of capital inflow net of capital outflow other than foreign direct investment. Table XVII present the results. We observe that higher capital inflows significantly lower the impact of leverage on credit risk measured as CDS spread and PD changes.

[Insert Table XVII here]

6.5 Effect of external debt on credit risk

We further study yet another country specific variable i.e. external debt impacts the leverage effect on credit risk. Once again we employ a triple interaction of leverage x post-crisis x external debt. External debt (netdebt) is measured as the outstanding amount of debt owed to non-residents as a % of GDP. We observe from Table XVIII that higher external debt significantly increases the impact of leverage on credit risk measured as CDS spread and PD changes.

6.6 Effect of country level governance on credit risk

We further study how governance impacts the leverage effect on credit risk. We employ a triple interaction of leverage x post-crisis x governance. Governance is the global governance factor obtained as the first principal component of all static and time-series governance variables as defined in the Appendix A. We observe from Table XVIII that better governance significantly lowers the impact of leverage on credit risk measured as CDS spread changes.

[Insert Table XVIII here]

7. Summary and Conclusions

In this paper, we assess the potential fallout from the increased corporate leverage in emerging market firms. We study how escalating emerging market corporate debt can impact the credit risk of underlying firms. Our regression results show that in the post crisis period, higher leverage significantly increases the PD of the firms; and lowers the DTD. The incremental leverage effects are most prominent in the Asian and Latin American region firms.

Our results remain robust to endogeneity correction and alternate regression methodologies. We also explore the channels through which higher leverage can impact credit risk in emerging markets. We observe that firm specific variables such as larger size and higher q ratio, signifying high growth prospects, can significantly lower the leverage effect on credit risk. Effect of higher leverage on credit risk is also significantly higher for tradable industry firms, and remain robust in all three geographic regions. For firms in countries experiencing higher capital flows effect of leverage on credit risk is much lower. On the contrary, for firms in countries laden with high external debt, effect of leverage on credit risk is significantly higher. Finally, for firms in countries

with better governance effect of leverage on credit risk is significantly lower.

Our findings could be relevant to different stakeholders such as foreign investors, issuing firms and underlying sovereigns. Rise in individual distress risk on the balance sheets of large firms can impact the market valuation of firms in aggregate, and in turn market wide perception of the emerging market's sovereign risk. Overall this can imply punitive capital costs for the emerging market firms on account of increased solvency, credit, liquidity and funding risks.

REFERENCES

Acharya V, S G Cecchetti, J De Gregorio, S Kalemli-Özcan, P R Lane and U Panizza (2015), "Corporate debt in emerging economies: a threat to financial stability? The Brookings Institution and the Centre for International Governance Innovation. September.

Avdjiev, Stefan, Michael Chui and Hyun Song Shin (2014), "Nonfinancial Corporations from Emerging Market Economies and Capital Flows," BIS Quarterly Review (December): 67-77.

Bruno, V., and Shin, H. S. (2017), "Global Dollar Credit and Carry Trades: A Firm-Level Analysis", The Review of Financial Studies, 30 (3), 703-749.

Chow, Julian T.S. (2015), "Stress Testing Corporate Balance Sheets in Emerging Economies", IMF working paper 15/216

Chui, Michael, Emese Kuruc and Philip Turner (2016), "A New Dimension to Currency Mismatches in the Emerging Markets: Nonfinancial Companies, Monetary and Economic Department", BIS working paper, Number 550.

Chui, M, I Fender and V Sushko (2014): "Risks Related To EME Corporate Balance Sheets: The Role of Leverage and Currency Mismatch", BIS Quarterly Review, September, pp. 35–47.

Collin-Dufresne, P, R. Goldstein, S. Martin (2001), The determinants of Credit Spread Changes, *Journal of Finance.* Vol. LVI No. 6, 2177-2206.

Dornbusch, R. (2001), "A primer on emerging market crises", NBER Working paper No. 8326.

Delikourasy, Stefanos, Robert F. Dittmarz, Li, Haitao (2015), "Do Dollar-Denominated Emerging Market Corporate Bonds Insure Foreign Exchange Risk?" SSRN working paper.

Diana Ayala, Milan Nedeljkovic, and Christian Saborowski (2015), "What Slice of the Pie? The Corporate Bond Market Boom in Emerging Economies", IMF working paper 15/248.

Erik Feyen, Swati Ghosh, Katie Kibuuka, Subika Farazi (2015), "Global Liquidity and External Bond Issuance in Emerging Markets and Developing Economies", Finance and Markets Global Practice Group, World Bank.

Gourio, Francois, Michael Siemer Adrien Verdelhan (2015), "Uncertainty and International Capital Flows", Federal Reserve Bank of Chicago Working paper.

Gourinchas, P. O., and Obstfeld, M. (2012), "Stories of the Twentieth Century for the Twenty-First", American Economic Journal: Macroeconomics, 4 (1), 226-265.

IMF Global Financial Stability Report (GFSR), October 2015, "Corporate Leverage In Emerging Markets—A Concern?" Chapter 3, Vulnerabilities, Legacies, and Policy Challenges, Risks Rotating to Emerging Markets.

Ismailescu, I., & Kazemi, H. (2010), "The Reaction of Emerging Market Credit Default Swap Spreads to Sovereign Credit Rating Changes", Journal of Banking & Finance, 34 (12), 2861-28.

Kennedy, M., and Palerm, A. (2014), "Emerging market bond spreads: The role of global and domestic factors from 2002 to 2011", Journal of International Money and Finance, 43, 70-87.

Kumar, Mohan, Uma Moorthy, William Perraudin (2003), "Predicting Emerging Market Currency Crashes", Journal of Empirical Finance 10, 427– 454

McCauley, R. N., McGuire, P., and Sushko, V. (2015), "Dollar Credit To Emerging Market Economies", BIS Quarterly Review, December, pp. 27–41.

Min, H. G., Lee, D. H., Nam, C., Park, M. C., and Nam, S. H. (2003), "Determinants of Emerging-Market Bond Spreads: Cross-Country Evidence", Global Finance Journal, 14 (3), 271-286.

Mizen, P., Packer, F., Remolona, E. M., and Tsoukas, S. (2012), "Why Do Firms Issue Abroad? Lessons from Onshore and Offshore Corporate Bond Finance in Asian Emerging Markets", BIS working paper, Number 401.

Rojas-Suarez, Liliana (2015), "Emerging Market Macroeconomic Resilience to External Shocks: Today versus Pre–Global Crisis", Center for global development, www.cgdev.org.

Shin, H S (2013), "The Second Phase of Global Liquidity and its Impact on Emerging Economies", remarks at the 2013 Federal Reserve Bank of San Francisco Asia Economic Policy Conference.

Timmer, Yannick (2016), "Emerging Market Corporate Bond Yields and Monetary Policy", SSRN working paper.

Tarashev, N., Avdjiev, S., and Cohen, B. (2016), "International Capital Flows and Financial Vulnerabilities in Emerging Market Economies: Analysis And Data Gaps", Note submitted to the G20 International Financial Architecture Working Group, Bank for International Settlements, August.

Tsai, F. T., Lu, H. M., & Hung, M. W. (2016), "The Impact of News Articles and Corporate Disclosure on Credit Risk Valuation", Journal of Banking & Finance, 68, 100-116.

Turner, P (2014): "The Global Long-term Interest Rate, Financial Risks and Policy Choices in EMEs", BIS Working Papers, no 441, February.

Zinna, Gabriele (2011), "Identifying Risks in Emerging Market Sovereign and Corporate Bond Spreads", Bank of England Working Paper No. 430.

Appendix A. Variable Definitions

VARIABLE	DEFINITION
Panel A: Credit risk variables	
CDS spreads	5-year CDS spreads at the end of the month (EOM) and monthly mean spreads (mean) calculated as the mean of daily spreads. Daily 5-year CDS spread are obtained from Markit database.
CDS liquidity	The number of unique contributors (Composite Depth) for the 5-year CDS spreads at the end of the month (EOM) and monthly mean values. Daily data are obtained from Markit database.
CDS volatility	Estimated using two proxies: (a) the range (maximum minus minimum) of 5-year CDS spreads over the month, and (b) standard deviation of historical 6 month daily 5-year CDS spread are obtained from Markit database
CDS slope	The difference between 10-year and 2-year CDS spreads at the end of the month (EOM) and monthly mean values. Daily 10-year and 2-year CDS spread are obtained from Markit database.
PD	12-month and 60-month probability of default, obtained from the Credit Risk Initiative (CRI) at the Risk Management Institute (RMI) of the National University of Singapore (NUS).
PD slope	Difference between 60 month and 12 month CDS spread.
DTD	Monthly distance-to-default data, obtained from the Credit Risk Initiative (CRI) at the Risk Management Institute (RMI) of the National University of Singapore (NUS).
Equity market risk	Three metrics based on market adjusted individual firm returns: Std dev, skewness, and kurtosis.
Panel B: Firm-level variables	
Market value of equity	Market value of company at the end of the month, obtained from Datastream.
Net debt DW	Net debt represents Total debt minus Cash & Short-term investments, 12-month trailing values are calculated by Datastream based on Worldscope (DW) data; obtained from Datastream.
Leverage	The ratio of Net Debt to Total Assets. Total assets 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream.
Leverage_MVC	The ratio of Net Debt to Market value of assets: [Net Debt / (Total Assets - Book value of equity + Market value of equity)]. Total Assets and Book Value of Equity are 12-month trailing values that are calculated by Datastream based on Worldscope data; obtained from Datastream.
Debt/EBIT	The ratio of Net debt to EBIT. EBIT 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream.
Debt/market value of equity	The ratio of Net debt to Market value of company.
Debt/book value of equity	The ratio of Net debt to Book value of equity. Book value of equity 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream.
PTBV	Price-to-book value ratio, obtained from Datastream.
Interest coverage DW	Interest charge coverage is the ratio of EBIT to Total Interest Expense, 12-month trailing values are calculated by Datastream based on Worldscope (DW) data; obtained from Datastream.
STA	The ratio of company's Net Sales to Total Assets. Net sales 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream. Total assets 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream.
ROS	The ratio of company's Net Income to Net Sales. Net income 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream. Net sales 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream.

ROA	The ratio of company's Net Income to Total Assets. Net income 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream. Total assets 12-month trailing values are calculated by Datastream based on Worldscope data; obtained from Datastream.
Tobin's Q	The ratio of market value of assets to book value of assets: [(Total Assets - Book value of equity + Market value of equity)/Total Assets]. Total Assets and Book Value of Equity are 12-month trailing values that are calculated by Datastream based on Worldscope data; obtained from Datastream.

Panel C: Industry-level variables

Industry	Industry under the FTSE/DJ Industry Classification Benchmark (ICB).
Tradable	tradable sector includes firms from Industrials, oil and gas, and Technology; non-tradable sector includes firms from construction, transportation, communications, utilities, wholesale/retail trade, and services.

Panel D: Country-level variables

S&P 500	Marker returns using the S&P 500 index
def	Default factor, obtained as Moody's BAA yield minus 10-year swap rate.
level	Level factor obtained as 3 month T-Bill rate
term	Term structure factor, obtained as 10-year rate minus 2-year Treasury rates.
vix	Equity market volatility factor, obtained as VIX index.
TED	Aggregate liquidity factor, obtained as 30-day LIBOR rate minus 3-month Treasury-Bill rate.
US-Swap rate	Swap rate for U.S. dollar
country_retvol	Country-specific equity return volatility, computed as standard deviation of country-specific monthly stock index returns over the year preceding the bond issuance date.
non-fdi	Capital flows is captured using non-foreign direct investment net capital which measures the monetary value of capital inflow net of capital outflow other than foreign direct investment. (source: Oxford Economics, Datastream)
netdebt	External debt is measured as the outstanding amount of debt owed to non-residents as a % of GDP. (source: Oxford Economics, Datastream)

Panel E: Governance variables

legsys	Overall score of legal system & property rights; data are from the Economic Freedom Dataset by Fraser Institute.
Legal Origin (Djankov et al 2008)	legal origin data from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008)
Anti-self-dealing index (Djankov et al 2008)	Anti-self-dealing index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008)
Revised Anti-director Index (Djankov et al 2008)	Revised Anti-director Index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008)
Creditor rights (La Porta et al 1998)	Index of creditor rights for a country; data are from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998)
Creditor rights (Djankov et al 2007)	Index of creditor rights for a country; data are from Djankov, McLiesh, Shleifer 2007 JFE "Private credit in 129 countries"

cifar (Bushman et al 2004)	Index created by examining and rating companies' 1995 annual reports on their inclusion or omission of 90 items. These items fall into seven categories: general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items. A minimum of 3 companies in each country were studied. See Bushman, Robert M., Joseph D. Piotroski, and Abbie J. Smith, 2004, "What Determines Corporate Transparency?", Journal of Accounting Research,
time (Bushman et al 2004)	Average ranking of the answers to the following interim reporting questions: Ea (frequency of reports), Ed–Ef (count of disclosed items), and Eb (consolidation of interim reports). See Bushman, Robert M., Joseph D. Piotroski, and Abbie J. Smith, 2004, "What Determines Corporate Transparency?", Journal of Accounting Research,
measure (Bushman et al 2004)	Average ranking of the answers to the following questions: A3 (consolidation) and A6p (discretionary reserves). See Bushman, Robert M., Joseph D. Piotroski, and Abbie J. Smith, 2004, "What Determines Corporate Transparency?", Journal of Accounting Research,
govern (Bushman et al 2004)	Average ranking of the answers to the following questions: B2a (range of shareholdings), B2b (major shareholders), Ce (management information), Cf (list of board members and their affiliations), Cg (remuneration of directors and officers), and Ch (shares owned by directors and employees). See Bushman, Robert M., Joseph D. Piotroski, and Abbie J. Smith, 2004, "What Determines Corporate Transparency?", Journal of Accounting Research,
discl (Bushman et al 2004)	Average ranking of the answers to the following questions: A6g (R&D), B3f (capital expenditure), Ca (subsidiaries),Cb (segment-product), Cc (segment-geographic), and D1 (accounting policy). Robust standard errors are shown in parentheses. See Bushman, Robert M., Joseph D. Piotroski, and Abbie J. Smith, 2004, "What Determines Corporate Transparency?", Journal of Accounting Research,
Accounting standards index (Bae et al 2008)	Accounting standards index (sum of 21 items); data from Bae, Tan, Welker 2008 The Accounting Review)
Governance factor	Global governance factor obtained as the first principal component of all the above listed static and time-series governance variables

Panel F: Emerging market economies

Asia	Includes China, India, Indonesia, Korea, Malaysia, Phillipines, Taiwan, Thailand, and Russian Federation.
EMEA	Refers to Eastern Europe, Middle East and Africa, and includes Bulgaria, Czech Republic, Egypt, Greece, Hungary, Turkey, Poland, South Africa, and Ukraine.
Latin America	Includes Argentina, Brazil, Chile, Colombia, and Mexico.

Appendix B. Sample Construction

We identify the list of emerging countries by combining the IMF's & MSCI's lists of emerging countries. Out of the 28 emerging countries from the IMF's and MSCI's lists, 23 emerging countries have CDS data available in Markit database. From Datastream we obtain a comprehensive list of stocks publicly listed in these emerging markets. From this list, we exclude preference shares and other secondary types of shares issued by companies with the exception is China where we exclude A-shares and include B-shares and H-shares that are accessible to foreign investors.

From Markit database, we extract daily CDS spreads data for stocks from the 23 emerging markets for the period January 2002 to December 2015. In particular, from Markit database we collect 2-year, 5-year and 10-year spreads and the number of contributors. We match the emerging market companies covered in Markit database against the list of emerging market stocks from Datastream and obtain 350 companies from 23 emerging countries. Table I provides sample distribution by country. The largest contributors to the sample are India (21.1%) and Taiwan (12.0%).

Next, we match the identified 350 stocks against the Credit Research Initiative database of the Risk Management Institute (RMI) of the National University of Singapore (NUS). From this database, we obtain company-level monthly data on the probability of default and the distance to default.

Firm-level variables for the sample stocks (including industry classification, market data – i.e. market value of equity, and balance sheet items) we obtain from Datastream.

Finally, we obtain country-level governance and market risk variables from multiple data bases as identified under Appendix A. The data for each variable is winsorized at 1% level to deal with any outliers.

Appendix C: Forward intensity model by Credit Risk Initiative

Here we briefly describe quantitative model used by Credit Risk Initiative (CRI) at the Risk Management Institute (RMI) of the National University of Singapore (NUS). The underlying forward intensity model was introduced in Duan, Sun and Wang (2012) [1] and also borrows from Duan and Fulop (2013)[2]. This model allows probability of default (PD) forecasts to be made at a range of horizons. The forward intensity model is a reduced form model in which the PD is computed as a function of different input variables. These can be firm-specific or common to all firms within an economy. The key innovation of the forward intensity model is that PD for different horizons can be consistently and efficiently computed based only on the value of the input variables at the time the prediction is made. Thus, the model specification becomes far more tractable. The model improves on the earlier reduced form model by Duffie, Saita and Wang (2007)[3] that relies on modeling the time series dynamics of the input variables in order to make PD forecasts for different horizons. Given the complexity in modeling the dynamics of variables such as accounting ratios, Duffie et al., (2007) model is difficult to implement if different forecast horizons are required. For more details on CRI see NUS-RMI Credit Research Initiative Technical Report Version: 2016, Global Credit Review, Vol. 6 (2016) 49–132.

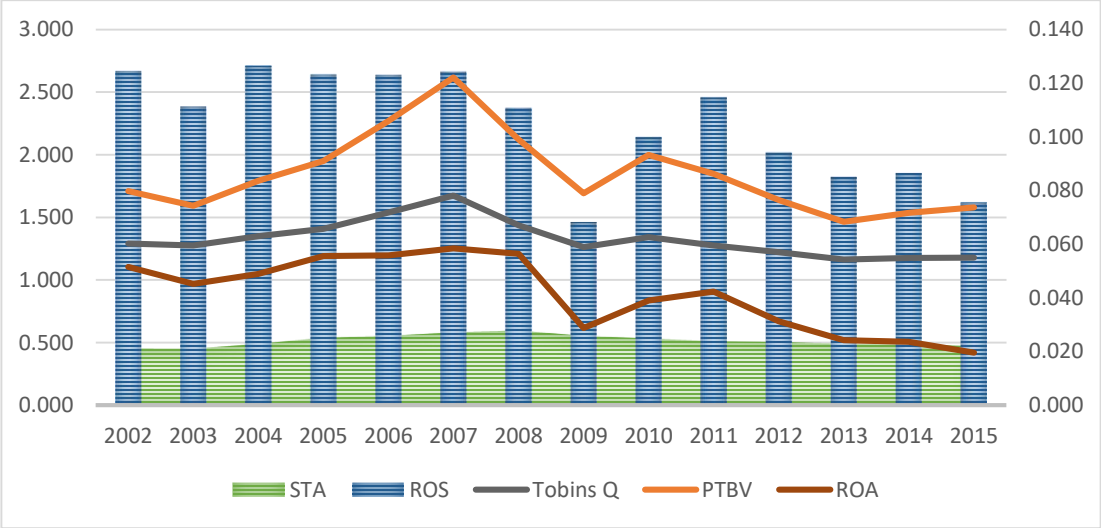
[1] Duan, J.-C., J. Sun and T. Wang (2012), Multiperiod Corporate Default Prediction — A Forward Intensity Approach. *Journal of Econometrics*, 170, pp. 191–209;

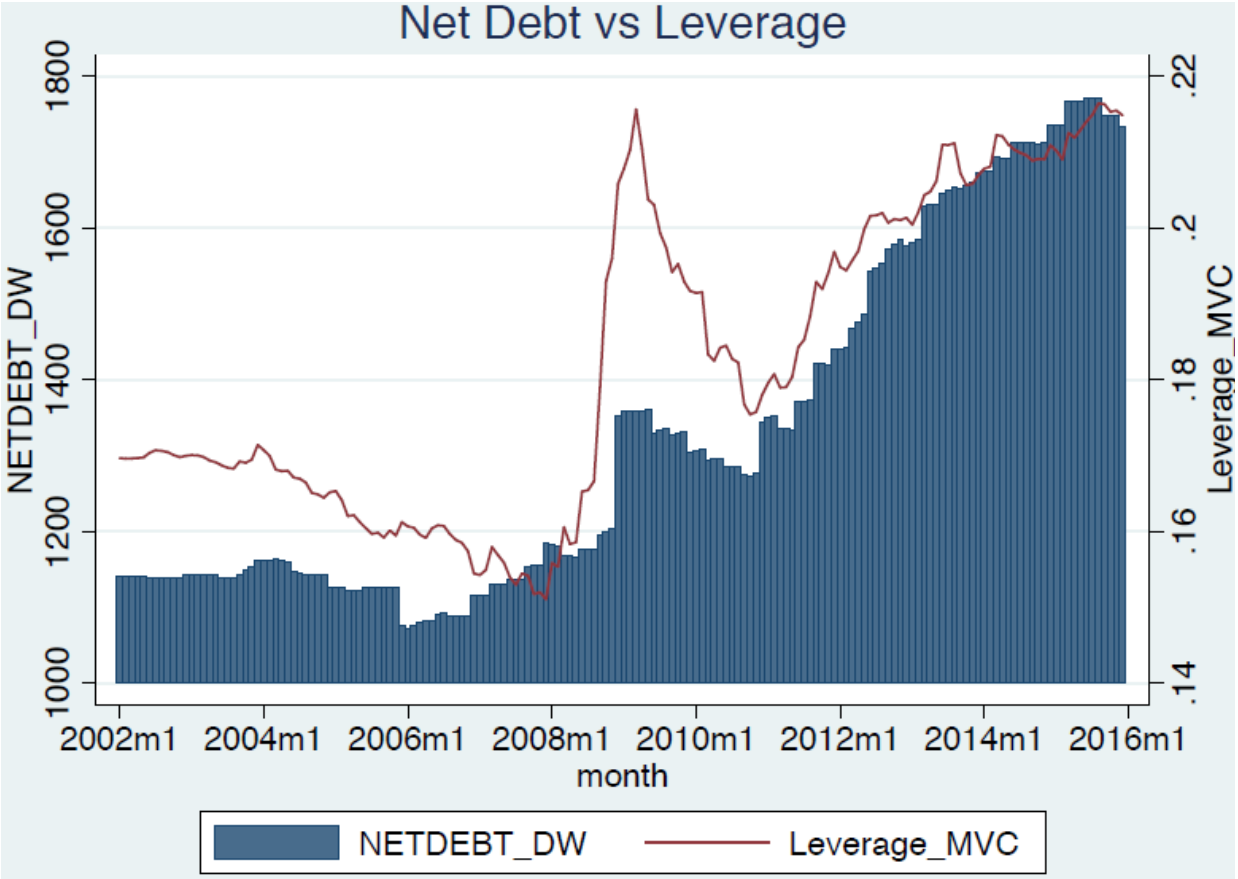
[2] Duan, J. C. and A. Fulop (2013), Multiperiod Corporate Default Prediction with the Partially-Conditioned Forward Intensity. National University of Singapore Working Paper..

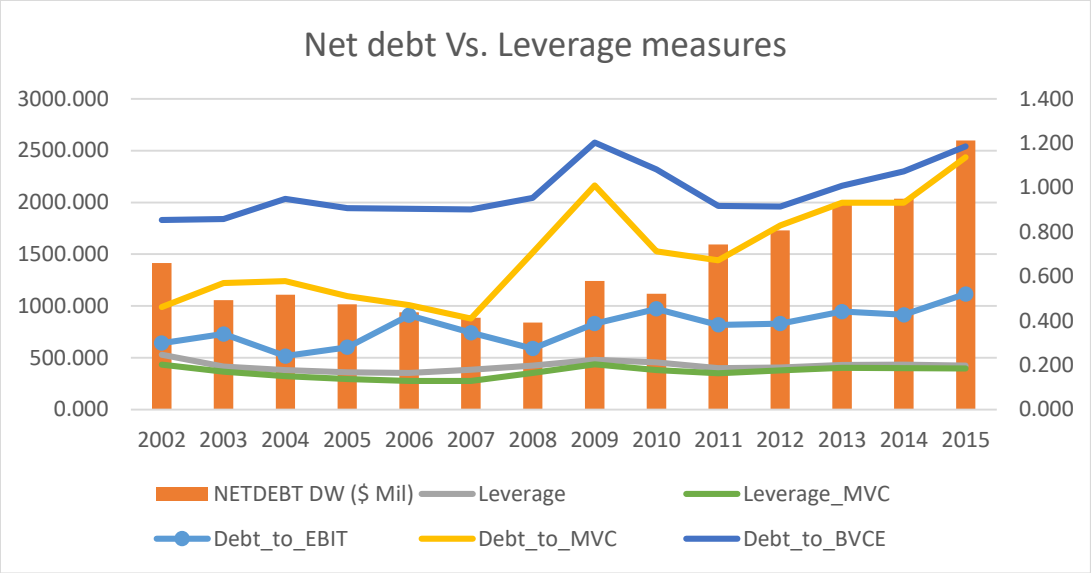
[3] Duffie, D., L. Saita and K.Wang (2007), Multi-Period Corporate Default Prediction with Stochastic Covariates. *Journal of Financial Economics*, 83, pp. 635–665.

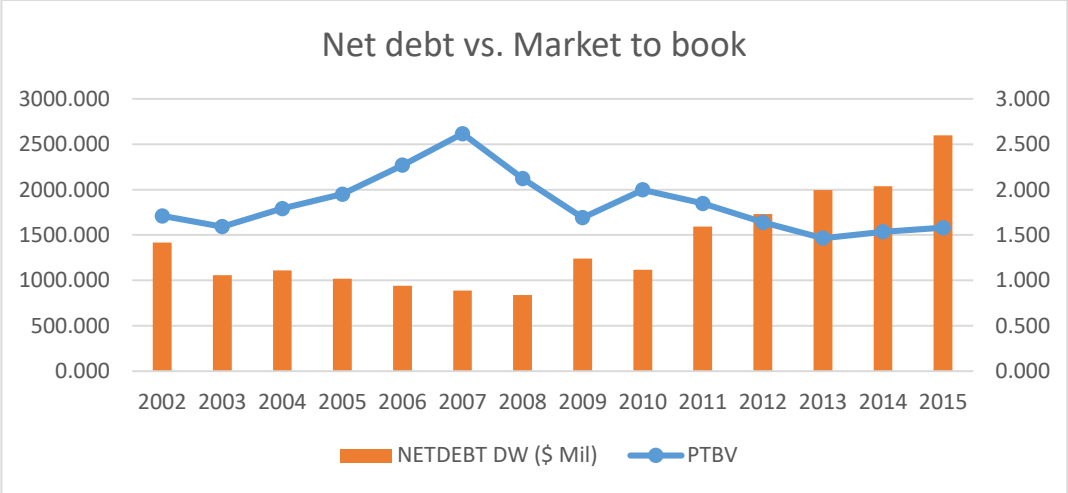
Figure I: Key financial variables of emerging markets over time

We present plots of average values of firm specific financial variables including sales to assets, return on sales, Q ratio, return on assets, leverage proxies, price to book and interest coverage for all emerging market firms for the period 2002-15. All the variables are defined in Appendix A.






Net debt Vs. Leverage measures
3000.000
2500.000
2000.000
1500.000
1000.000
500.000
0.000
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
NETDEBT DW ($ Mil)
Leverage
Leverage_MVC
Debt_to_EBIT
Debt_to_MVC
Debt_to_BVCE


Net debt vs. Market to book
3000.000
2500.000
2000.000
1500.000
1000.000
500.000
0.000
3.000
2.500
2.000
1.500
1.000
0.500
0.000
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
NETDEBT DW ($ Mil)
PTBV

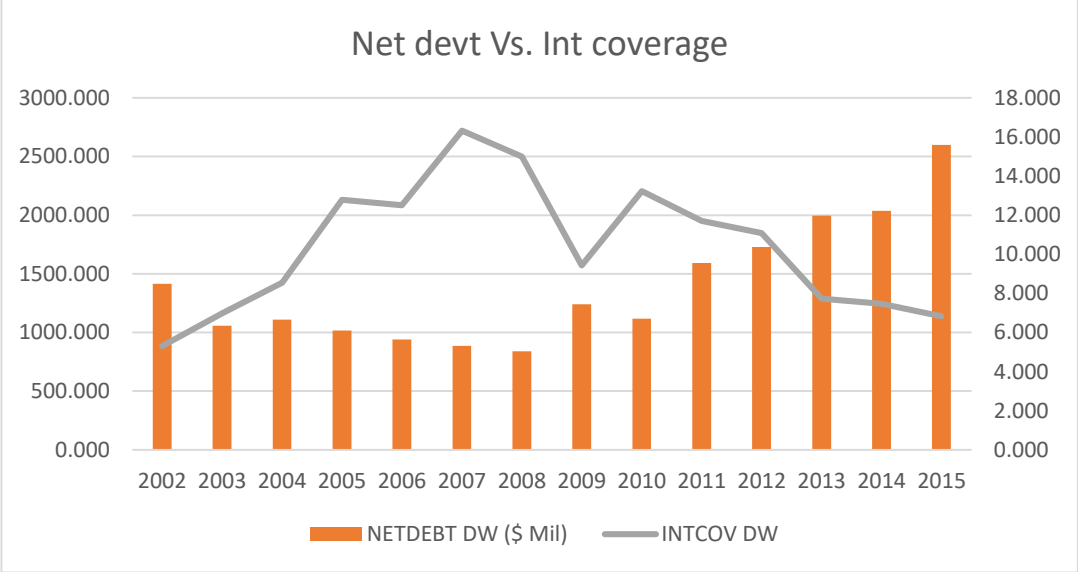
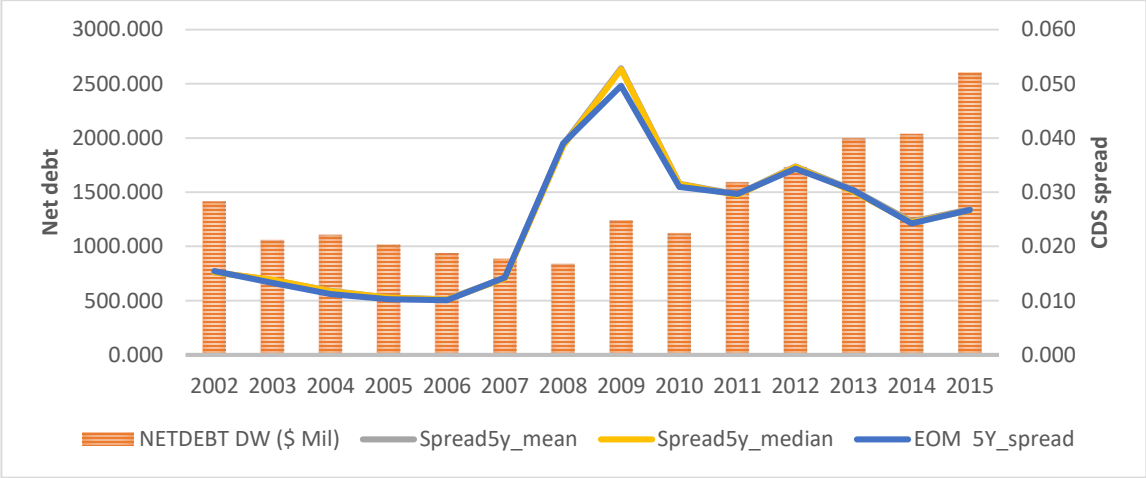
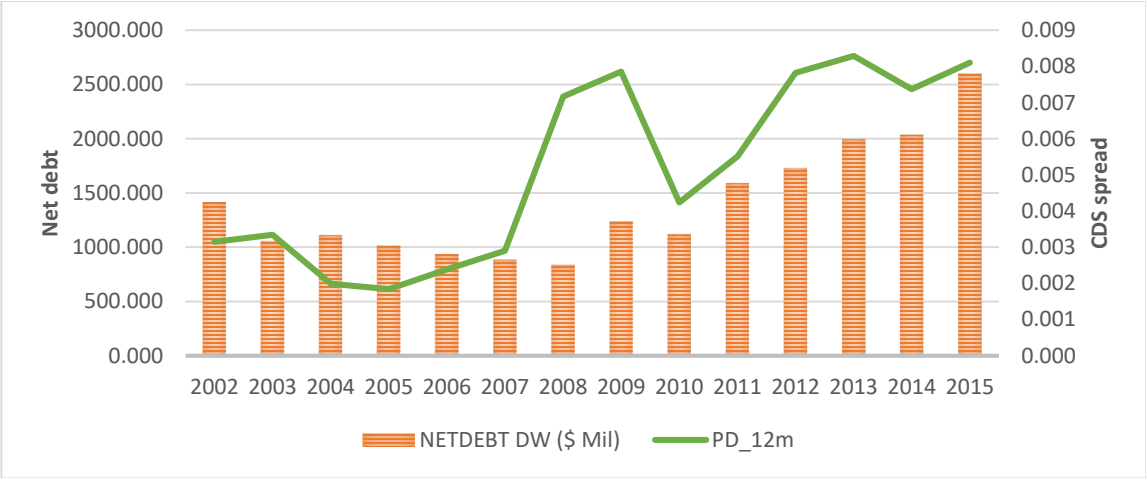

Net devt Vs. Int coverage
3000.000
2500.000
2000.000
1500.000
1000.000
500.000
0.000
18.000
16.000
14.000
12.000
10.000
8.000
6.000
4.000
2.000
0.000
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
NETDEBT DW ($ Mil)
INTCOV DW

Figure II: Key credit risk variables of emerging markets over time

We present plots of average values of firm specific credit risk variables including CDS spread, PD and DTD for all emerging market firms for the period 2002-15. All the variables are defined in Appendix A.





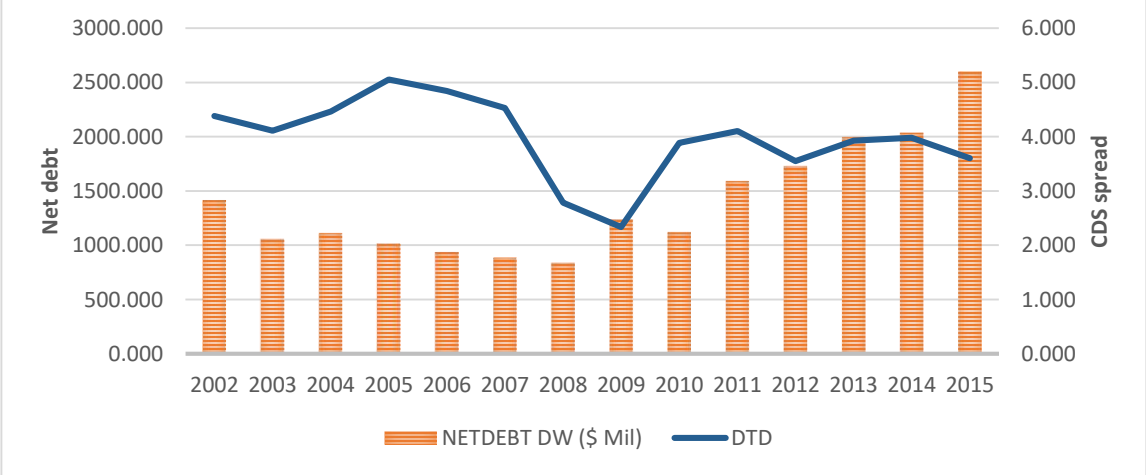


Figure III: Leverage Vs. CDS of emerging markets by region over time

We present plots of average values of firm specific CDS for emerging market firms by region for the period 2002-15. All the variables are defined in Appendix A.

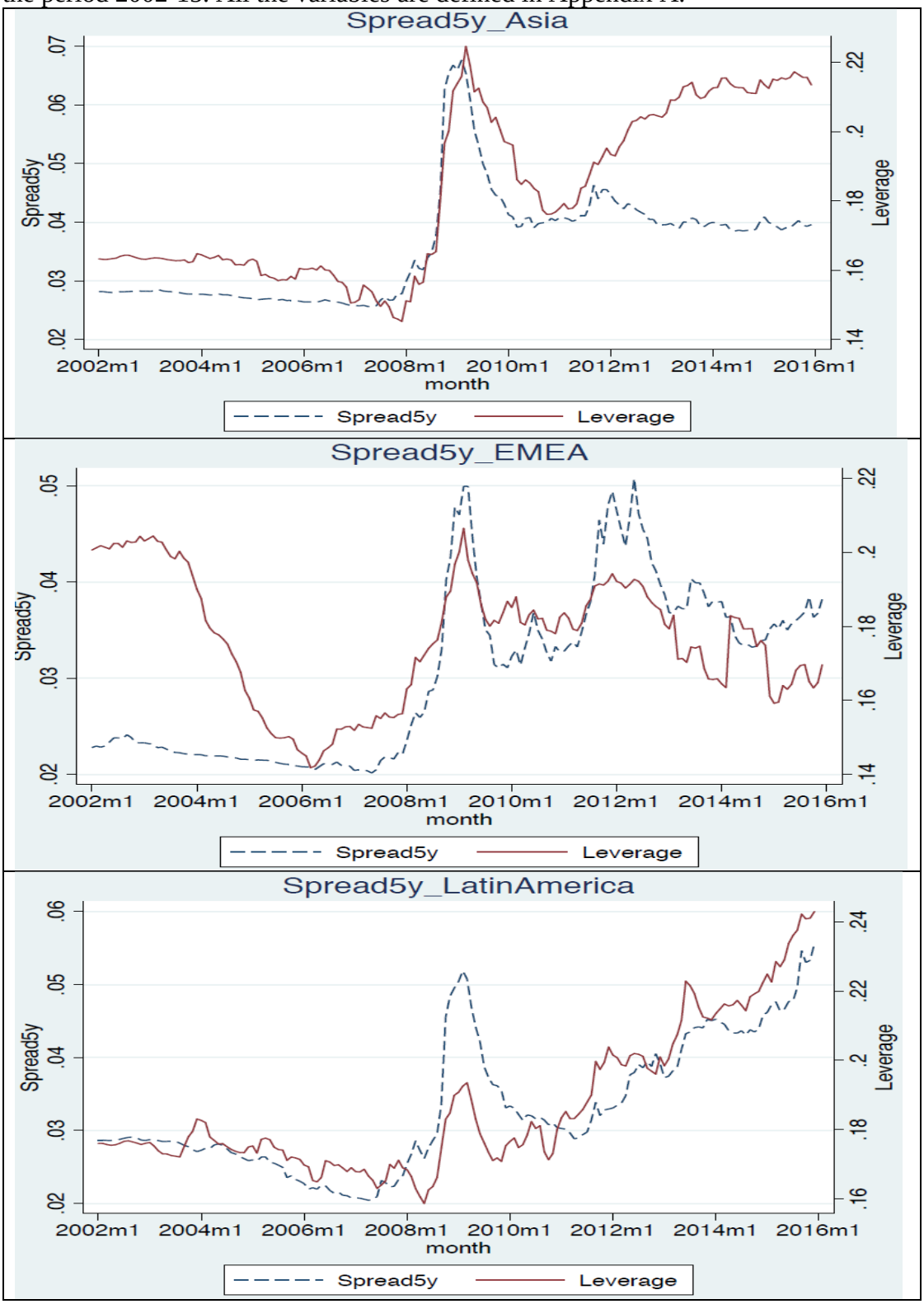


Figure IV: Leverage Vs. PD of emerging markets by region over time

We present plots of average values of firm specific PD for emerging market firms by region for the period 2002-15. All the variables are defined in Appendix A.

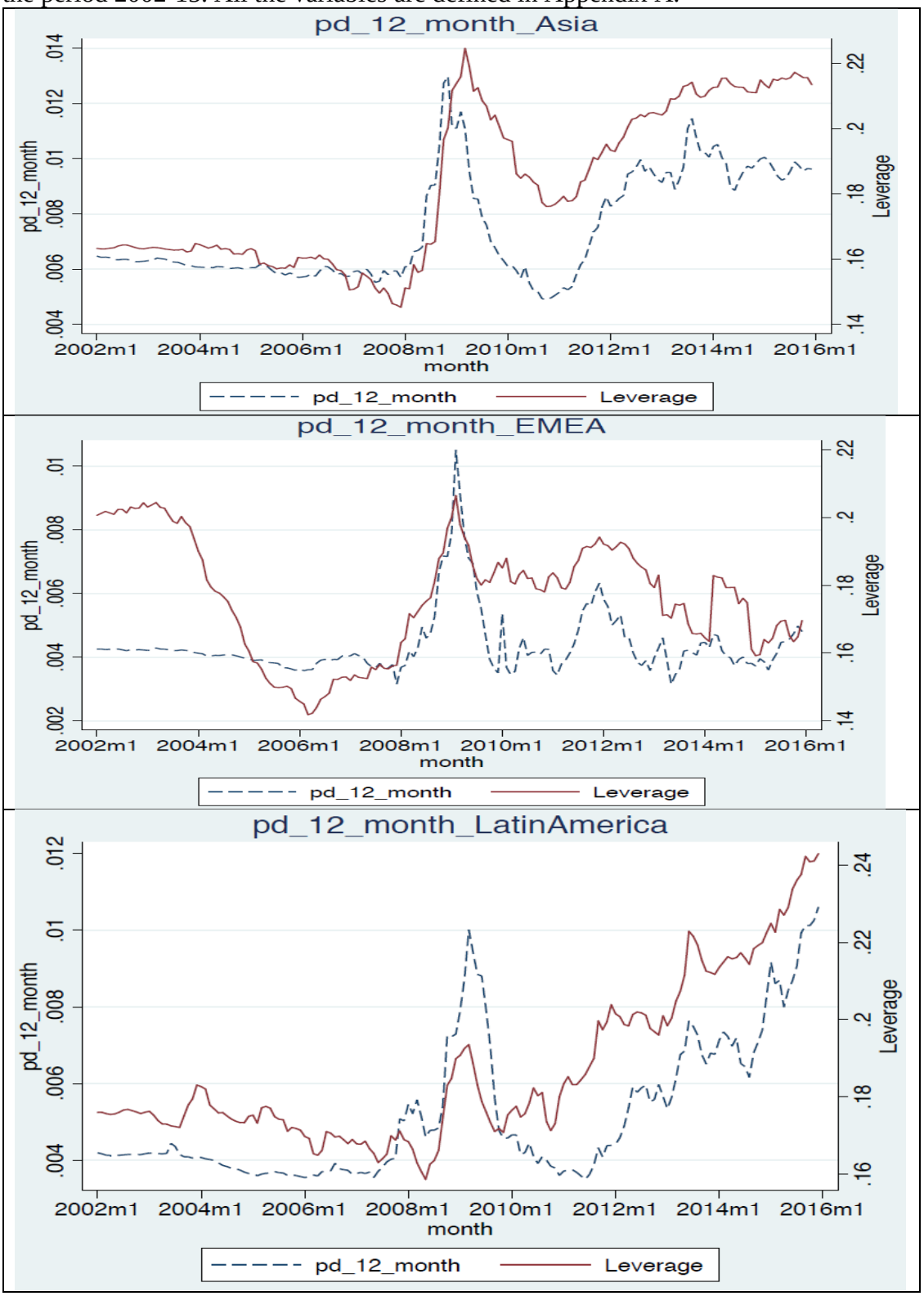


Figure V: Leverage Vs. DTD of emerging markets by region over time

We present plots of average values of firm specific DTD for emerging market firms by region for the period 2002-15. All the variables are defined in Appendix A.

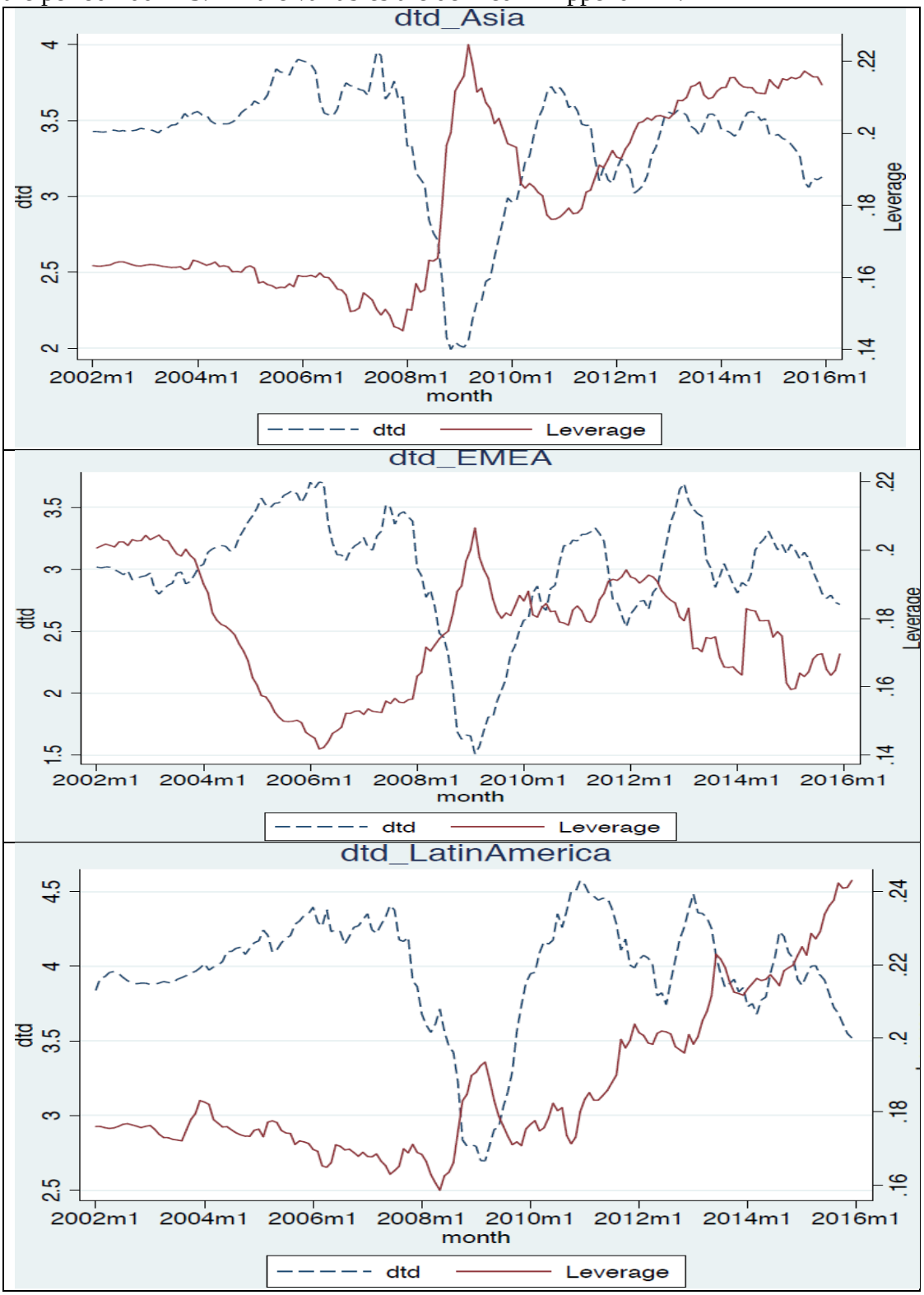


Table I: Sample Distribution by Country

We report sample breakdown by each emerging market country for the period 2002-15. Details of sample construction are described in Appendix B.

Home country	Number of companies	% of total number of companies
Argentina	7	2.0%
Brazil	29	8.3%
Bulgaria	1	0.3%
Chile	8	2.3%
China	12	3.4%
Colombia	3	0.9%
Czech Republic	2	0.6%
Egypt	1	0.3%
Greece	7	2.0%
Hungary	3	0.9%
India	74	21.1%
Indonesia	17	4.9%
Malaysia	17	4.9%
Mexico	18	5.1%
Philippines	13	3.7%
Poland	1	0.3%
Russia	22	6.3%
South Africa	11	3.1%
South Korea	34	9.7%
Taiwan	42	12.0%
Thailand	17	4.9%
Turkey	9	2.6%
Ukraine	2	0.6%
TOTAL	350	100.0%

Table II: Summary statistics of balance sheet and accounting variables

We report summary stats of several key variables for emerging markets by industry, region and sub-period samples using the data for the period 2002-15. In Panel A we report different leverage proxies. In Panel B we report balance sheet and accounting variables. All the variables are defined in Appendix A.

Panel A

Years	NETDEBTDW ($ Mil)	Leverage	Leverage_MVC	Debt_to_EBIT	Debt_to_MVC	Debt_to_BVCE
2002	1415.850	0.246	0.203	2.992	0.462	0.854
2003	1057.397	0.194	0.171	3.405	0.570	0.859
2004	1108.792	0.178	0.150	2.407	0.579	0.949
2005	1016.983	0.167	0.137	2.803	0.511	0.908
2006	939.858	0.165	0.129	4.247	0.470	0.905
2007	886.911	0.179	0.129	3.459	0.410	0.902
2008	838.031	0.197	0.165	2.746	0.706	0.954
2009	1241.209	0.224	0.203	3.873	1.009	1.203
2010	1118.158	0.213	0.178	4.533	0.713	1.083
2011	1592.326	0.186	0.163	3.817	0.672	0.917
2012	1730.004	0.189	0.176	3.872	0.829	0.914
2013	1996.431	0.201	0.188	4.411	0.932	1.008
2014	2035.833	0.202	0.187	4.265	0.932	1.073
2015	2599.549	0.197	0.184	5.202	1.137	1.186
Regions						
Asia	1858.118	0.182	0.158	3.776	0.688	0.875
EMEA	90.805	0.213	0.187	5.391	1.036	1.540
Latin America	688.718	0.231	0.198	3.187	0.820	1.126
Subperiods						
2002-2006	1030.603	0.175	0.143	3.362	0.511	0.906
2007-2009	988.239	0.201	0.167	3.341	0.718	1.022
2010-2015	1807.852	0.198	0.179	4.336	0.859	1.026
Industries						
Basic Materials	1483.588	0.224	0.197	3.614	0.629	0.776
Consumer Goods	2784.181	0.214	0.195	3.547	0.796	0.808
Consumer Services	555.379	0.158	0.118	2.665	0.280	0.511
Financials	1320.847	0.131	0.121	5.450	1.105	1.525
Health Care	12.624	0.309	0.209	4.076	0.595	1.520
Industrials	765.746	0.212	0.183	2.602	0.659	0.896
Oil & Gas	532.971	0.185	0.164	1.961	0.520	0.638
Technology	467.450	0.059	0.057	2.691	0.152	0.196
Telecommunications	2317.957	0.281	0.224	3.504	0.669	0.991
Utilities	2032.803	0.266	0.237	4.817	0.858	0.918

Panel B

Years	PTBV	INTCOV DW	STA	ROS	ROA	Q ratio
2002	1.711	5.303	0.454	0.124	0.052	1.291
2003	1.592	6.980	0.453	0.111	0.045	1.276
2004	1.792	8.543	0.489	0.127	0.049	1.350
2005	1.951	12.793	0.539	0.123	0.056	1.409
2006	2.270	12.506	0.555	0.123	0.056	1.538
2007	2.617	16.331	0.582	0.124	0.058	1.675
2008	2.122	14.997	0.599	0.111	0.056	1.436
2009	1.692	9.436	0.555	0.068	0.029	1.263
2010	1.998	13.225	0.534	0.100	0.039	1.342
2011	1.848	11.705	0.510	0.115	0.042	1.277
2012	1.640	11.087	0.507	0.094	0.031	1.222
2013	1.465	7.732	0.489	0.085	0.024	1.164
2014	1.536	7.466	0.484	0.086	0.024	1.175
2015	1.580	6.823	0.472	0.076	0.020	1.180
Regions						
Asia	1.779	13.556	0.543	0.105	0.041	1.337
EMEA	1.862	6.693	0.421	0.099	0.031	1.263
Latin America	2.245	5.625	0.548	0.087	0.041	1.364
Subperiods						
2002-2006	1.993	10.911	0.528	0.127	0.054	1.427
2007-2009	2.128	13.529	0.590	0.101	0.050	1.450
2010-2015	1.689	9.850	0.517	0.099	0.031	1.231
Industries						
Basic Materials	1.906	9.004	0.655	0.072	0.048	1.391
Consumer Goods	1.753	20.933	0.905	0.067	0.051	1.417
Consumer Services	2.019	5.910	0.513	0.099	0.045	1.535
Financials	1.645	8.828	0.088	0.148	0.011	1.075
Health Care	3.548	23.242	0.578	0.144	0.080	2.242
Industrials	1.840	7.776	0.680	0.055	0.034	1.319
Oil & Gas	1.492	15.454	1.036	0.090	0.072	1.338
Technology	1.737	29.483	0.805	0.063	0.051	1.445
Telecommunications	2.506	5.011	0.584	0.081	0.049	1.455
Utilities	1.766	8.063	0.451	0.123	0.045	1.400

Table III: Summary statistics

We report summary stats of different firm-level risk proxies for emerging markets by industry, region and sub-period samples using the data for the period 2002-15. In Panel A we report leverage, and different CDS risk proxies (CDS spread, CDS liquidity, CDS volatility and CDS slope). In Panel B we report PD (PD level and slope) and DTD risk in addition to equity market risk (idiosyncratic volatility, idiosyncratic skewness) variables. All the variables are defined in Appendix A.

Panel A

		CDS spreads		**CDS liquidity**		**CDS vol**		**CDS slope**	
Years	Leverage	Spread5y_mean	EOM 5Y_spread	Composite Depth5y Mean	Composite Depth5y_EOM	Spd5y_range	Spd5y_EOM_Historical_stddev	Spd_10y-1y_mean	Spd_10y-1y_EOM
2002	0.246	0.015	0.015	2.740	2.843	0.002	0.003	0.009	0.010
2003	0.194	0.014	0.013	3.578	3.949	0.002	0.002	0.009	0.007
2004	0.178	0.012	0.011	4.513	4.918	0.002	0.002	0.009	0.009
2005	0.167	0.011	0.010	4.849	5.106	0.002	0.001	0.009	0.009
2006	0.165	0.010	0.010	4.057	4.157	0.001	0.001	0.008	0.008
2007	0.179	0.014	0.014	3.472	3.562	0.002	0.001	0.008	0.008
2008	0.197	0.039	0.039	3.520	3.679	0.012	0.008	0.011	0.009
2009	0.224	0.053	0.050	3.345	3.472	0.010	0.012	0.005	0.003
2010	0.213	0.032	0.031	0.000	0.000	0.005	0.004	0.007	0.007
2011	0.186	0.030	0.030	3.166	3.258	0.006	0.004	0.008	0.007
2012	0.189	0.035	0.034	3.313	3.409	0.006	0.004	0.010	0.008
2013	0.201	0.030	0.030	3.337	3.486	0.005	0.003	0.012	0.012
2014	0.202	0.025	0.024	3.237	3.386	0.004	0.002	0.012	0.012
2015	0.197	0.027	0.027	3.197	3.297	0.005	0.003	0.012	0.012
Regions									
Asia	0.182	0.028	0.027	3.683	3.839	0.005	0.004	0.009	0.008
EMEA	0.213	0.031	0.031	2.782	2.841	0.006	0.004	0.009	0.008
Latin America	0.231	0.029	0.029	3.242	3.311	0.005	0.004	0.012	0.011
Subperiods									
2002-2006	0.175	0.011	0.011	4.233	4.456	0.002	0.001	0.009	0.008
2007-2009	0.201	0.035	0.034	3.450	3.576	0.008	0.007	0.008	0.007
2010-2015	0.198	0.030	0.030	3.253	3.370	0.005	0.003	0.010	0.010
Industries									
Basic Materials	0.224	0.037	0.037	3.058	3.080	0.006	0.005	0.010	0.009
Consumer Goods	0.214	0.035	0.034	4.026	4.120	0.006	0.006	0.008	0.007
Consumer Services	0.158	0.020	0.020	3.909	3.954	0.003	0.003	0.009	0.010
Financials	0.131	0.022	0.022	3.157	3.453	0.006	0.003	0.009	0.009
Health Care	0.309	0.054	0.053	2.124	2.125	0.007	0.009	0.002	-0.006
Industrials	0.212	0.037	0.037	3.327	3.366	0.005	0.005	0.010	0.010
Oil & Gas	0.185	0.029	0.028	3.682	3.737	0.006	0.005	0.011	0.011
Technology	0.059	0.029	0.029	2.525	2.570	0.004	0.005	0.008	0.011
Telecommunications	0.281	0.028	0.028	4.682	4.768	0.006	0.005	0.010	0.008
Utilities	0.266	0.018	0.018	3.698	3.789	0.004	0.003	0.009	0.009

Panel B

		PD			DTD	Equity market risks		
Years	Leverage	PD_12m	PD_60m	PDSpd_60m-12m		Std dev	Skewness	Kurtosis
2002	0.246	0.003	0.025	0.022	4.383	0.069	-0.108	2.233
2003	0.194	0.003	0.023	0.019	4.110	0.065	-0.005	2.248
2004	0.178	0.002	0.019	0.017	4.467	0.060	0.063	2.274
2005	0.167	0.002	0.018	0.016	5.057	0.057	0.001	2.446
2006	0.165	0.002	0.023	0.020	4.843	0.067	0.021	2.497
2007	0.179	0.003	0.027	0.024	4.528	0.068	0.087	2.536
2008	0.197	0.007	0.044	0.037	2.783	0.095	0.044	2.714
2009	0.224	0.008	0.055	0.047	2.335	0.112	-0.128	2.743
2010	0.213	0.004	0.037	0.032	3.886	0.075	0.174	2.788
2011	0.186	0.006	0.036	0.031	4.105	0.064	0.141	2.587
2012	0.189	0.008	0.044	0.036	3.551	0.076	0.047	2.683
2013	0.201	0.008	0.044	0.036	3.926	0.071	0.086	2.682
2014	0.202	0.007	0.041	0.034	3.980	0.070	0.119	2.701
2015	0.197	0.008	0.044	0.036	3.603	0.072	0.044	2.683
Regions								
Asia	0.182	0.003	0.042	0.039	3.831	0.078	0.069	2.661
EMEA	0.213	0.002	0.024	0.022	3.121	0.068	0.025	2.667
Latin America	0.231	0.002	0.033	0.031	4.044	0.077	0.036	2.542
Subperiods								
2002-2006	0.175	0.002	0.021	0.019	4.735	0.063	0.019	2.412
2007-2009	0.201	0.006	0.042	0.036	3.162	0.093	-0.002	2.671
2010-2015	0.198	0.007	0.041	0.034	3.840	0.071	0.104	2.690
Industries								
Basic Materials	0.224	0.006	0.038	0.032	4.114	0.084	0.036	2.617
Consumer Goods	0.214	0.005	0.032	0.027	4.164	0.090	0.017	2.525
Consumer Services	0.158	0.002	0.020	0.017	4.735	0.065	0.034	2.475
Financials	0.131	0.009	0.047	0.039	2.378	0.064	0.054	2.626
Health Care	0.309	0.004	0.042	0.038	4.235	0.101	-0.132	2.690
Industrials	0.212	0.007	0.049	0.042	3.415	0.090	0.050	2.581
Oil & Gas	0.185	0.004	0.035	0.031	4.092	0.075	0.053	2.618
Technology	0.059	0.001	0.011	0.009	4.485	0.084	0.069	2.745
Telecommunications	0.281	0.005	0.035	0.030	4.316	0.086	0.087	2.769
Utilities	0.266	0.004	0.031	0.026	5.697	0.061	0.157	2.712

Table IV: Correlations for balance sheet and credit risk variables

We present correlations variables for the underlying firms for all the emerging markets using the data for the period 2002-15. The variables we report include balance sheet and financial variables in Panel A, and credit risk proxies (i.e. CDS spreads, PD and DTD), credit market (CDS depth) liquidity proxies, and equity market risks in Panel B. All the variables are defined in Appendix A.

Panel A

	Variables	1	2	3	4	5	6	7	8	9	10	11	12
1	NETDEBT DW ($ Mil)	1											
2	Leverage	0.204	1										
3	Leverage_MVC	0.234	0.930	1									
4	Debt_to_EBIT	0.137	0.344	0.349	1								
5	Debt_to_MVC	0.272	0.545	0.680	0.384	1							
6	Debt_to_BVCE	0.155	0.658	0.642	0.410	0.707	1						
7	PTBV	-0.114	0.012	-0.215	-0.075	-0.296	0.041	1					
8	INTCOV_DW	-0.091	-0.403	-0.355	-0.103	-0.187	-0.231	0.112	1				
9	STA	0.022	0.041	0.010	-0.105	-0.176	-0.205	0.036	0.083	1			
10	ROS	-0.117	-0.333	-0.391	-0.088	-0.265	-0.159	0.250	0.291	-0.258	1		
11	ROA	-0.123	-0.260	-0.360	-0.156	-0.351	-0.294	0.350	0.413	0.306	0.622	1	
12	Tobins_Q	-0.123	-0.138	-0.341	-0.121	-0.332	-0.172	0.742	0.320	0.160	0.321	0.579	1

Panel B

	variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Leverage	1.00															
2	Spread5y_mean	0.32	1.00														
3	EOM 5Y_spread	0.32	0.99	1.00													
4	Composite Depth5y Mean	-0.11	-0.23	-0.24	1.00												
5	Composite Depth5y _EOM	-0.11	-0.22	-0.23	0.94	1.00											
6	Spd5y_range	0.15	0.49	0.49	-0.04	-0.01	1.00										
7	Spd5y_EOM_Historical_stddev	0.23	0.68	0.69	-0.08	-0.07	0.59	1.00									
8	Spd_10y-1y_mean	0.01	-0.21	-0.19	-0.08	-0.07	-0.06	-0.18	1.00								
9	Spd_10y-1y_EOM	0.01	-0.22	-0.21	-0.09	-0.08	-0.08	-0.20	0.92	1.00							
10	PD_12m	0.21	0.34	0.35	-0.14	-0.11	0.26	0.23	0.05	0.04	1.00						
11	PD_60m	0.27	0.34	0.34	-0.15	-0.12	0.25	0.26	0.11	0.10	0.89	1.00					
12	PDSpd_60m-12m	0.27	0.32	0.32	-0.15	-0.12	0.23	0.26	0.12	0.11	0.82	0.99	1.00				
13	DTD	-0.29	-0.37	-0.37	0.29	0.24	-0.27	-0.29	-0.01	-0.01	-0.49	-0.48	-0.46	1.00			
14	Std dev	0.26	0.47	0.46	-0.15	-0.14	0.26	0.39	-0.07	-0.06	0.33	0.32	0.31	-0.41	1.00		
15	Skewness	-0.01	-0.07	-0.07	0.03	0.03	-0.08	-0.11	0.03	0.04	-0.07	-0.06	-0.05	0.08	-0.07	1.00	
16	Kurtosis	-0.01	0.09	0.08	0.03	0.04	0.07	0.10	-0.02	-0.01	0.02	0.01	0.01	-0.01	0.18	0.04	1.00

Table V: Univariate sorting based on leverage

We first sort the firm leverage into quartiles each month and then report the average values of variables for the underlying firms for all the emerging markets using the data for the period 2002-15. The variables we report include balance sheet and financial variables in Panel A, and credit risk proxies (i.e. CDS spreads, PD and DTD) and equity market risks in Panel B. All the variables are defined in Appendix A.

Panel A

		Balance Sheet & Financial variables								
	Leverage_MVC	NETDEBT DW ($ Mil)	Leverage	Leverage_MVC	PTBV	INTCOV DW	STA	ROS	ROA	Tobins Q
				2002-15						
Lowest	1	-113.826	-0.015	-0.013	2.196	28.428	0.469	0.157	0.060	1.586
	2	1284.700	0.148	0.103	2.110	8.295	0.562	0.124	0.053	1.459
	3	2043.364	0.249	0.204	1.773	5.237	0.566	0.088	0.035	1.232
Highest	4	2466.064	0.398	0.382	1.430	2.704	0.518	0.033	0.011	1.055
				2002-06						
Lowest	1	15.534	-0.007	-0.009	2.304	22.840	0.544	0.166	0.068	1.662
	2	791.368	0.161	0.105	2.201	9.067	0.547	0.145	0.071	1.589
	3	1708.598	0.255	0.207	1.768	5.275	0.526	0.100	0.045	1.244
Highest	4	2049.378	0.377	0.355	1.501	2.055	0.447	0.052	0.014	1.067
				2007-09						
Lowest	1	-1.652	-0.021	-0.018	2.503	38.365	0.570	0.152	0.073	1.767
	2	1046.061	0.164	0.101	2.517	8.510	0.625	0.116	0.064	1.646
	3	1284.327	0.261	0.203	1.974	4.006	0.574	0.084	0.034	1.299
Highest	4	1660.176	0.409	0.390	1.484	2.153	0.545	0.048	0.017	1.067
				2010-15						
Lowest	1	-240.466	-0.015	-0.011	1.951	24.198	0.374	0.157	0.048	1.435
	2	1625.907	0.133	0.104	1.811	7.882	0.526	0.121	0.040	1.288
	3	2584.226	0.241	0.204	1.662	5.913	0.575	0.086	0.032	1.191
Highest	4	2992.100	0.397	0.383	1.385	3.142	0.518	0.022	0.007	1.045

Panel B

		CDS spread	CDS liquidity	CDS vol		CDS slope	PD		DTD	Equity risks		
Leverage_MVC		EOM 5Y_spread	Composite Depth5y_EOM	Spd5y_range	Spd5y_EOM_Historical_stddev	Spd_10y-1y_EOM	PD_60m	PDSpd_60m-12m		Std dev	Skewness	Kurtosis
						2002-15						
Lowest	1	0.018	3.896	0.004	0.002	0.009	0.029	0.024	4.905	0.065	0.069	2.638
	2	0.023	3.736	0.005	0.003	0.010	0.028	0.025	4.152	0.069	0.067	2.607
	3	0.026	3.670	0.005	0.004	0.009	0.037	0.032	3.612	0.074	0.048	2.636
Highest	4	0.045	3.176	0.008	0.007	0.007	0.058	0.048	2.467	0.098	0.045	2.676
						2002-06						
Lowest	1	0.008	4.594	0.001	0.001	0.007	0.017	0.015	5.173	0.056	0.026	2.493
	2	0.011	4.566	0.002	0.002	0.009	0.017	0.016	5.080	0.063	0.039	2.390
	3	0.012	4.336	0.002	0.001	0.009	0.025	0.022	4.357	0.065	0.001	2.334
Highest	4	0.014	4.224	0.002	0.002	0.009	0.026	0.023	4.059	0.069	0.002	2.425
						2007-09						
Lowest	1	0.021	3.960	0.006	0.004	0.007	0.028	0.025	4.450	0.078	0.040	2.730
	2	0.028	3.718	0.007	0.006	0.008	0.035	0.031	3.388	0.086	0.030	2.656
	3	0.033	3.626	0.008	0.007	0.006	0.044	0.038	2.967	0.089	-0.015	2.614
Highest	4	0.058	2.925	0.012	0.012	0.006	0.063	0.053	1.790	0.118	-0.064	2.680
						2010-15						
Lowest	1	0.020	3.542	0.003	0.002	0.010	0.034	0.028	5.092	0.060	0.105	2.635
	2	0.024	3.429	0.004	0.002	0.010	0.028	0.024	4.300	0.061	0.100	2.652
	3	0.027	3.464	0.005	0.003	0.011	0.036	0.031	3.721	0.067	0.097	2.742
Highest	4	0.045	3.088	0.007	0.006	0.007	0.062	0.050	2.486	0.093	0.113	2.723

Table VI: Bivariate sorting based on leverage and idiosyncratic volatility

We first sort the firm leverage into quartiles each month and then further sort each leverage quartile into four more quartiles based on the idiosyncratic volatility of the underlying firms for all the emerging markets using the data for the period 2002-15.We report the average value of each credit risk proxy i.e. CDS spreads, PD and DTD for each of the 4 X 4 bins. All the variables are defined in Appendix A.

		Idiosyncratic ret vol											
		Lowest 1			2			3			Highest 4		
Leverage_MVC		CDS EOM 5Y_spread	PD_60m	DTD	CDS EOM 5Y_spread	PD_60m	DTD	CDS EOM 5Y_spread	PD_60m	DTD	CDS EOM 5Y_spread	PD_60m	DTD
	2002-15												
Lowest	1	0.012	0.015	5.978	0.015	0.020	5.229	0.019	0.034	4.355	0.033	0.063	3.137
	2	0.017	0.017	5.112	0.018	0.023	4.564	0.023	0.031	3.747	0.041	0.046	2.631
	3	0.021	0.026	4.690	0.022	0.032	3.983	0.027	0.042	3.183	0.039	0.049	2.423
Highest	4	0.026	0.034	3.611	0.029	0.049	3.170	0.037	0.052	2.622	0.064	0.072	1.718
	2002-06												
Lowest	1	0.007	0.015	5.181	0.008	0.020	5.456	0.009	0.013	5.403	0.014	0.016	4.886
	2	0.009	0.013	5.477	0.009	0.014	5.631	0.012	0.020	4.502	0.017	0.025	3.844
	3	0.011	0.025	5.295	0.009	0.020	4.547	0.011	0.030	3.244	0.017	0.029	3.562
Highest	4	0.007	0.021	5.156	0.010	0.032	4.359	0.018	0.018	3.403	0.020	0.023	3.019
	2007-09												
Lowest	1	0.009	0.012	5.710	0.016	0.017	5.238	0.019	0.024	4.370	0.033	0.052	2.969
	2	0.012	0.022	4.552	0.019	0.028	3.871	0.029	0.036	3.327	0.042	0.042	2.565
	3	0.017	0.023	4.392	0.021	0.037	3.948	0.031	0.040	2.896	0.048	0.059	1.989
Highest	4	0.030	0.031	2.182	0.030	0.041	2.781	0.041	0.054	2.119	0.074	0.075	1.420
	2010-15												
Lowest	1	0.015	0.016	6.387	0.017	0.023	5.120	0.022	0.051	3.890	0.034	0.086	3.058
	2	0.020	0.017	5.174	0.022	0.026	4.428	0.022	0.031	3.793	0.045	0.059	2.376
	3	0.025	0.026	4.552	0.026	0.033	3.832	0.028	0.047	3.364	0.035	0.044	2.619
Highest	4	0.029	0.039	3.359	0.035	0.058	2.886	0.039	0.057	2.718	0.060	0.074	1.847

Table VII: Panel regressions of credit risk using aggregate data

This table reports the results of monthly panel regressions of credit risk proxies (in levels and changes) for all the emerging markets using the data for the period 2002-15. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. Panel A presents the results for the aggregate data while Panel B presents the regression results for the quartiles leverage groups. Each firm is assigned to a leverage group based on the firm's average leverage ratio for over the sample (e.g., Collin-Dufresne et al. (2001). All variables are defined in Appendix A. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)
		Levels			Changes	
VARIABLES	Spread5y	pd_60_month	DTD	Spread5y	pd_60_month	dtd
Leverage_MVC	0.0242***	0.0416***	-1.545**	0.00758*	0.0215***	-0.965*
	(0.00833)	(0.0115)	(0.777)	(0.00421)	(0.00820)	(0.553)
leverage X crisis	0.00986	0.0236**	-1.224*	0.00353	0.0154***	-0.311
	(0.00898)	(0.00965)	(0.649)	(0.00392)	(0.00497)	(0.373)
Leverage X postcrisis	0.0123	0.0161	-1.850**	0.000338	0.0194***	-0.551
	(0.00845)	(0.0119)	(0.724)	(0.00432)	(0.00730)	(0.457)
firmsd_12e	0.141***	0.117***	-11.62***	0.0270***	0.0466***	-3.780***
	(0.0238)	(0.0223)	(1.852)	(0.0101)	(0.0109)	(0.793)
firmsd_12e X crisis	-0.0301	-0.00117	3.228*	-0.000637	-0.0145	0.727
	(0.0217)	(0.0184)	(1.665)	(0.00772)	(0.0107)	(0.714)
firmsd_12e X postcrisis	-0.0308	-0.0410	5.688***	-0.0107	-0.0259*	1.209
	(0.0248)	(0.0259)	(1.991)	(0.00882)	(0.0146)	(0.811)
INTCOV_DW	-1.86e-05	2.23e-05	0.00171	-9.21e-06	-1.98e-06	0.000939
	(2.00e-05)	(1.92e-05)	(0.00110)	(1.75e-05)	(4.95e-06)	(0.000893)
Sales_to_Assets	-0.00148	-0.00378	0.801***	0.000364	0.00315	-0.0414
	(0.00355)	(0.00675)	(0.285)	(0.00165)	(0.00202)	(0.0990)
ROS	-0.0191	-0.00438	1.255**	-0.000265	0.00314	-0.140
	(0.0131)	(0.00981)	(0.547)	(0.00370)	(0.00373)	(0.132)
ROA	0.0353	-0.0481*	0.778	-0.0220*	-0.0181	1.090**
	(0.0301)	(0.0256)	(1.560)	(0.0118)	(0.0117)	(0.433)
PTBV	-0.00323***	-0.00511***	0.205***	-0.00155***	-0.00709***	0.408***
	(0.000672)	(0.00102)	(0.0555)	(0.000372)	(0.000933)	(0.0447)
market_returns	-0.00709***	-0.00919***	1.085***	-0.00638***	-0.00483***	0.521***
	(0.00194)	(0.00194)	(0.115)	(0.000993)	(0.00104)	(0.0457)
sp500	-0.0177***	-0.0140***	0.708**	-0.00446	-2.08e-05	0.0907
	(0.00570)	(0.00525)	(0.340)	(0.00301)	(0.00231)	(0.117)
Vix	0.000367***	-3.11e-05	-0.00306	0.000400***	0.000126***	-0.0121***
	(5.34e-05)	(5.83e-05)	(0.00378)	(3.91e-05)	(3.02e-05)	(0.00154)
Default	0.00847***	0.00691***	-0.769***	0.00449***	0.00162***	-0.201***
	(0.00114)	(0.00101)	(0.0589)	(0.000947)	(0.000548)	(0.0214)
FRTBS3M	-0.00296***	0.000517	-0.0841*	-0.00283***	4.22e-05	0.0403*
	(0.000402)	(0.000623)	(0.0466)	(0.000456)	(0.000390)	(0.0214)
Slope	-0.00188***	0.00222**	-0.313***	-0.000811*	0.00184***	-0.0591**
	(0.000675)	(0.000966)	(0.0585)	(0.000432)	(0.000388)	(0.0229)
Ted	-0.000967	-0.000306	-0.217***	0.00200***	0.000306	0.0464***
	(0.000979)	(0.000892)	(0.0505)	(0.000500)	(0.000321)	(0.0154)
Constant	0.0109***	0.0238***	5.559***	0.000151***	4.07e-06	0.00333***
	(0.00336)	(0.00547)	(0.291)	(1.85e-05)	(1.62e-05)	(0.000791)
Observations	16,719	18,261	18,261	16,154	17,921	17,921
Adjusted R-squared	0.387	0.260	0.323	0.139	0.109	0.131

Panel B

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
		ΔSpread5y				Δpd_60_month				ΔDTD		
VARIABLES	Lowest Lev	Lev II	Lev III	Highest Lev	Lowest Lev	Lev II	Lev III	Highest Lev	Lowest Lev	Lev II	Lev III	Highest Lev
Leverage_MVC	0.000779	0.00346	0.00283	0.00689	0.00231	0.00700	0.0388***	0.0347**	0.183	-1.441	-2.965***	-1.234
	(0.00194)	(0.00644)	(0.00607)	(0.00884)	(0.00246)	(0.00894)	(0.0128)	(0.0161)	(0.279)	(1.154)	(0.793)	(1.155)
leverage X crisis	0.00752	-0.00194	0.0112	-0.00161	-0.00199	0.0134	0.0204*	0.0181**	-0.500	-0.468	0.0886	-0.528
	(0.00461)	(0.00794)	(0.00932)	(0.00568)	(0.00502)	(0.0123)	(0.0116)	(0.00803)	(0.360)	(1.315)	(0.718)	(0.696)
leverage X postcrisis	0.00645	0.000414	-0.00213	0.00244	-0.00455	0.0134	0.00961	0.0161	-0.431	0.0409	0.373	-0.763
	(0.00397)	(0.00765)	(0.00697)	(0.00778)	(0.00399)	(0.0107)	(0.0139)	(0.0124)	(0.628)	(1.311)	(0.827)	(0.841)
firmsd_12e	0.0257	0.0349	0.0316***	0.0155	-0.00142	0.0841***	0.0541***	0.0544	-6.534***	-5.602**	-1.686	-3.476*
	(0.0172)	(0.0234)	(0.0118)	(0.0133)	(0.0105)	(0.0300)	(0.0170)	(0.0342)	(2.003)	(2.636)	(1.104)	(1.966)
firmsd_12e X crisis	0.0145*	-0.00109	-0.0291	0.0170	0.0138	-0.0135	-0.0526**	-0.0347	-0.0239	1.666	0.427	1.482
	(0.00814)	(0.0145)	(0.0229)	(0.0295)	(0.0112)	(0.0286)	(0.0230)	(0.0327)	(1.199)	(2.375)	(1.306)	(1.901)
firmsd_12e X postcrisi	0.00443	-0.0106	-0.0106	-0.0136	-0.00884	-0.0496*	-0.0470*	-0.0131	1.866	1.709	-0.603	1.765
	(0.00992)	(0.0193)	(0.0159)	(0.0157)	(0.0147)	(0.0276)	(0.0245)	(0.0402)	(1.560)	(2.507)	(1.306)	(2.141)
INTCOV_DW	8.10e-06	2.16e-05	9.97e-05	-8.31e-05*	-5.65e-06	6.75e-06	-0.000229	-1.58e-06	0.00184	-0.000894	0.00174	-5.47e-05
	(1.31e-05)	(1.71e-05)	(0.000146)	(4.79e-05)	(3.55e-06)	(8.05e-06)	(0.000184)	(1.20e-05)	(0.00128)	(0.000937)	(0.00406)	(0.000258)
Sales_to_Assets	0.00137	0.00165	-0.00118	0.00105	-0.000381	0.00352	0.00340	0.00607	0.0908	-0.172*	-0.273	0.158
	(0.00196)	(0.00169)	(0.00424)	(0.00540)	(0.00130)	(0.00351)	(0.00337)	(0.00509)	(0.180)	(0.0930)	(0.249)	(0.183)
ROS	-0.00215	0.00227	0.00601	0.000818	0.00679***	-0.00673	-0.00128	0.00673	-0.119	0.213	-0.612*	-0.0573
	(0.00162)	(0.00334)	(0.00408)	(0.0130)	(0.00241)	(0.00741)	(0.00769)	(0.00862)	(0.187)	(0.333)	(0.314)	(0.242)
ROA	-0.0155*	-0.0124	-0.0176	-0.0814*	-0.00578	-0.00235	0.0108	-0.0437	1.649*	0.317	1.390	0.833
	(0.00892)	(0.00795)	(0.0173)	(0.0484)	(0.00692)	(0.0147)	(0.0215)	(0.0367)	(0.859)	(0.762)	(0.848)	(0.919)
PTBV	-0.00102**	-0.00146***	-0.00184***	-0.00145	-0.00489***	-0.00568***	-0.00582***	-0.0114***	0.599***	0.371***	0.368***	0.338***
	(0.000405)	(0.000437)	(0.000650)	(0.000940)	(0.00125)	(0.000875)	(0.00190)	(0.00310)	(0.0747)	(0.0600)	(0.0788)	(0.0791)
market_returns	-0.00555***	-0.00672***	-0.00618***	-0.00703***	-0.00468**	-0.00240**	-0.00318*	-0.00769***	0.581***	0.526***	0.468***	0.427***
	(0.00115)	(0.000940)	(0.00168)	(0.00264)	(0.00208)	(0.00115)	(0.00170)	(0.00275)	(0.108)	(0.0839)	(0.0986)	(0.0614)
sp500	9.86e-06	-0.00692	-0.00483	-0.00578	0.000295	0.00250	-0.00143	0.00261	-0.263	0.248	0.122	0.0231
	(0.00311)	(0.00579)	(0.00427)	(0.00904)	(0.00325)	(0.00278)	(0.00582)	(0.00466)	(0.313)	(0.265)	(0.203)	(0.189)
vix	0.000321***	0.000319***	0.000430***	0.000515***	6.36e-05	0.000118**	0.000124**	0.000200***	-0.0114***	-0.0112***	-0.0126***	-0.0126***
	(4.28e-05)	(7.32e-05)	(5.23e-05)	(0.000109)	(5.24e-05)	(4.56e-05)	(6.11e-05)	(6.25e-05)	(0.00326)	(0.00334)	(0.00247)	(0.00275)
default	0.000943	0.00168*	0.00193	0.00978***	0.00187**	-0.000251	0.00215*	0.000667	-0.126***	-0.208***	-0.225***	-0.166***
	(0.000902)	(0.000874)	(0.00121)	(0.00265)	(0.000821)	(0.000765)	(0.00120)	(0.00129)	(0.0362)	(0.0503)	(0.0519)	(0.0382)
FRTBS3M	-0.00140***	-0.00222***	-0.00367***	-0.00423***	0.000211	0.000860	0.000274	0.000224	0.0324	0.0191	-0.0174	0.0420
	(0.000487)	(0.000487)	(0.00131)	(0.00147)	(0.000340)	(0.000691)	(0.00125)	(0.00104)	(0.0482)	(0.0505)	(0.0422)	(0.0466)
slope	-0.000198	-0.000109	-0.000804	-0.00114	0.00147**	0.00153**	0.00145**	0.00295***	-0.0969*	-0.0745	-0.0231	-0.0519
	(0.000624)	(0.000436)	(0.000643)	(0.00139)	(0.000604)	(0.000653)	(0.000647)	(0.000910)	(0.0492)	(0.0518)	(0.0386)	(0.0327)
ted	0.00156**	0.00113	0.00313***	0.00184	0.000568	0.00142**	-8.82e-05	-0.000877	0.0474*	0.00295	0.0129	0.0871***
	(0.000757)	(0.000895)	(0.00110)	(0.00131)	(0.000410)	(0.000679)	(0.000698)	(0.000678)	(0.0275)	(0.0355)	(0.0271)	(0.0307)
Constant	0.000147***	5.60e-05***	0.000138***	0.000250***	-3.86e-05**	0.000141***	-4.41e-05	-0.000210***	-0.00350*	-0.00128	0.00739***	0.00998***
	(1.86e-05)	(2.03e-05)	(4.78e-05)	(8.03e-05)	(1.85e-05)	(1.84e-05)	(4.14e-05)	(6.35e-05)	(0.00205)	(0.00141)	(0.00158)	(0.00253)
Observations	4,105	3,972	4,095	3,982	4,528	4,321	4,499	4,573	4,528	4,321	4,499	4,573
Adjusted R-squared	0.188	0.177	0.217	0.122	0.0625	0.117	0.0951	0.158	0.117	0.109	0.150	0.185

Table VIII: Panel regressions of credit risk with Endogeneity correction

This table reports the results of Heckman correction applied to panel regressions in Table VII. We run the first stage probit regressions of leverage level (high=1; low=0) on several instrumental variables Sales to Assets ROA, Tobin's Q, all industry dummies, lagged CDS, lagged PD, lagged DTD. The high (or low) leverage is based on firm's debt being above (or below) on the firm's average leverage ratio for over the sample. We then use inverse Mills ratio (IMR) from the probit model as an additional independent variable in the second stage regression. Only the second stage regression results are reported below. We employ the Heckman correction to credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15 Explanatory variables in the second stage regressions include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

VARIABLES	(1) Level Spread5y	(2) Level pd_12_month	(3) Level dtd	(4) Change Spread5y	(5) Change pd_12_month	(6) Change dtd
Leverage_MVC	0.0251***	0.0118***	-0.187	0.00563*	0.00504**	-0.671
	(0.00845)	(0.00348)	(0.670)	(0.00320)	(0.00245)	(0.533)
leverage X crisis	0.00974	0.00638**	-1.477***	0.00248	0.00511***	-0.344
	(0.00906)	(0.00282)	(0.540)	(0.00266)	(0.00155)	(0.371)
Leverage X postcrisis	0.0123	0.00800**	-2.146***	0.000307	0.00775***	-0.664
	(0.00858)	(0.00359)	(0.612)	(0.00390)	(0.00257)	(0.462)
firmsd X 12e	0.142***	0.0291***	-11.29***	0.0227**	0.0119***	-4.311***
	(0.0245)	(0.00760)	(1.671)	(0.0104)	(0.00332)	(0.937)
firmsd X 12e X crisis	-0.0313	-0.00485	3.400**	0.00192	-0.00534*	1.044
	(0.0219)	(0.00583)	(1.552)	(0.00697)	(0.00302)	(0.799)
firmsd X 12e X postcrisis	-0.0286	-0.00131	5.028***	-0.00717	-0.00925*	1.613*
	(0.0255)	(0.00909)	(1.796)	(0.00845)	(0.00532)	(0.922)
INTCOV_DW	-2.07e-05	3.46e-06	-0.00219	-6.59e-06	-2.66e-08	-0.000196
	(2.05e-05)	(5.45e-06)	(0.00162)	(1.80e-05)	(1.70e-06)	(0.000359)
Sales_to_Assets	-0.00125	0.000554	-0.0934	0.00121	0.00162	-0.0595
	(0.00355)	(0.00144)	(0.297)	(0.00139)	(0.00114)	(0.0771)
ROS	-0.0177	-0.00707**	2.450***	0.000725	7.75e-05	-0.0166
	(0.0131)	(0.00297)	(0.611)	(0.00301)	(0.00128)	(0.0802)
ROA	0.0310	0.00617	-16.15***	-0.0176	0.000794	0.706**
	(0.0317)	(0.00964)	(1.948)	(0.0114)	(0.00342)	(0.309)
PTBV	-0.00323***	-0.00148***	-0.362***	-0.00157***	-0.00214***	0.421***
	(0.000696)	(0.000259)	(0.0830)	(0.000313)	(0.000283)	(0.0414)
market_returns	-0.00763***	-0.00395***	1.061***	-0.00617***	-0.00122***	0.483***
	(0.00188)	(0.000753)	(0.112)	(0.000939)	(0.000320)	(0.0441)
sp500	-0.0175***	-0.00781***	0.521*	-0.00143	1.77e-05	0.0100
	(0.00554)	(0.00193)	(0.311)	(0.00256)	(0.000765)	(0.124)
vix	0.000356***	-5.72e-05***	0.000876	0.000422***	3.76e-05***	-0.0122***
	(5.31e-05)	(2.15e-05)	(0.00327)	(3.40e-05)	(1.16e-05)	(0.00158)
default	0.00872***	0.00175***	-0.473***	0.00285***	0.000336**	-0.169***
	(0.00116)	(0.000335)	(0.0530)	(0.000586)	(0.000162)	(0.0209)
FRTBS3M	-0.00287***	7.51e-05	-0.135***	-0.00229***	0.000506***	0.0356
	(0.000410)	(0.000184)	(0.0447)	(0.000326)	(0.000139)	(0.0220)
slope	-0.00176***	-3.75e-05	-0.212***	-0.000638*	0.000717***	-0.0680***
	(0.000680)	(0.000289)	(0.0530)	(0.000377)	(0.000182)	(0.0212)
ted	-0.00104	0.000894***	-0.214***	0.00200***	0.000205*	0.0500***
	(0.000957)	(0.000294)	(0.0438)	(0.000465)	(0.000123)	(0.0154)
IMR	0.000371	-0.000481	2.602***	-0.000214*	2.01e-05	-0.0567***
	(0.00134)	(0.000613)	(0.226)	(0.000118)	(3.24e-05)	(0.0130)
Constant	0.00963***	0.00299*	4.216***	0.000362***	-9.43e-08	0.0614***
	(0.00356)	(0.00160)	(0.278)	(0.000127)	(3.62e-05)	(0.0140)
Observations	16,272	16,566	16,566	16,022	16,302	16,302
Adjusted R-squared	0.324	0.132	0.269	0.143	0.0904	0.123

Table IX: Time series regressions using principal components for aggregate data

This table reports the monthly time-series regressions using three credit risk proxies i.e. CDS spreads, PD and DTD (in changes) for all the emerging markets using the data for the period 2002-15. We first extract principal component of all the credit risk proxies and balance sheet variables of all firms for each country over time and use the first principal components in the time series regressions. Explanatory variables include country-specific principal comments of leverage, volatility and other firm-specific characteristics; in addition to aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-country correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

VARIABLES	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
		Spread5y			pd_60_month			DTD	
pc1_dcn_Leverage_MVC	-0.0918**	-0.0912**	-0.0978**	-0.0615	-0.0594	-0.0765*	0.0967	0.101*	0.114**
	(0.0435)	(0.0433)	(0.0461)	(0.0476)	(0.0476)	(0.0435)	(0.0595)	(0.0607)	(0.0572)
Leverage X crisis	0.239***	0.240***	0.200**	0.302***	0.305***	0.206***	-0.273***	-0.266***	-0.158**
	(0.0800)	(0.0831)	(0.0797)	(0.0790)	(0.0802)	(0.0687)	(0.0732)	(0.0737)	(0.0641)
Leverage X postcrisis	0.0895	0.0891	0.0881	0.106*	0.105*	0.102*	-0.195***	-0.198***	-0.190***
	(0.0616)	(0.0612)	(0.0627)	(0.0592)	(0.0593)	(0.0529)	(0.0712)	(0.0719)	(0.0657)
pc1_dcn_firmsd_12e	-0.0285	-0.0278	-0.0336	-0.0978	-0.0952	-0.111*	-0.0263	-0.0213	-0.0103
	(0.0793)	(0.0796)	(0.0797)	(0.0681)	(0.0679)	(0.0656)	(0.0767)	(0.0770)	(0.0734)
pc1_dcn_firmsd_12e X crisis	0.327**	0.326**	0.320**	0.210**	0.208**	0.197**	-0.128	-0.133	-0.110
	(0.146)	(0.143)	(0.144)	(0.0943)	(0.0939)	(0.0893)	(0.0871)	(0.0875)	(0.0849)
pc1_dcn_firmsd_12e X postcrisis	0.0635	0.0627	0.0631	0.180**	0.177**	0.180**	-0.161*	-0.166*	-0.159**
	(0.0915)	(0.0919)	(0.0911)	(0.0776)	(0.0775)	(0.0754)	(0.0850)	(0.0852)	(0.0805)
market_return	-0.290***	-0.290***	-0.230***	-0.222***	-0.222***	-0.0721***	0.307***	0.307***	0.128***
	(0.0274)	(0.0273)	(0.0278)	(0.0236)	(0.0236)	(0.0228)	(0.0187)	(0.0187)	(0.0194)
sp500	-0.416	-0.431	-0.0540	0.464	0.416	1.186	0.327	0.243	-0.712
	(2.092)	(2.051)	(2.069)	(2.208)	(2.184)	(2.066)	(1.203)	(1.208)	(1.011)
dvix	0.141***	0.141***	0.136***	0.0795***	0.0790***	0.0667***	-0.0604***	-0.0613***	-0.0461***
	(0.0232)	(0.0229)	(0.0229)	(0.0206)	(0.0203)	(0.0191)	(0.0124)	(0.0125)	(0.0106)
ar1	0.0793*	0.0793*	0.0828*	0.121***	0.121***	0.124***	0.157***	0.156***	0.169***
	(0.0473)	(0.0473)	(0.0468)	(0.0382)	(0.0381)	(0.0386)	(0.0233)	(0.0234)	(0.0208)
pc1_dcn_INTCOV_DW		0.00399			0.0134			0.0264	
		(0.0342)			(0.0286)			(0.0230)	
pc1_dcn_PTBV			-0.137***			-0.341***			0.408***
			(0.0348)			(0.0356)			(0.0329)
Constant	-0.0164	-0.0164	-0.0155	0.000158	9.66e-05	0.00290	-0.00870	-0.00885	-0.0113
	(0.128)	(0.128)	(0.129)	(0.110)	(0.110)	(0.105)	(0.0960)	(0.0961)	(0.0871)
Observations	2,779	2,779	2,779	2,779	2,779	2,779	2,779	2,779	2,779
Adjusted R-squared	0.416	0.416	0.424	0.289	0.289	0.355	0.418	0.418	0.515

Table X: Cross-sectional averages of monthly time-series regressions for aggregate data

This table reports the cross-sectional averages of monthly time-series regressions of each firm following Collin-Dufresne et al., (2001). Firm-specific time-series regression is conducting using three credit risk proxies i.e. CDS spreads, PD and DTD (in levels and changes) for all the emerging markets using the data for the period 2002-15. We then calculate cross-sectional average of time series coefficients across all firms. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. Panel A presents the results for the aggregate data while Panel B presents the regression results for the quartiles leverage groups. Each firm is assigned to a leverage group based on the firm's average leverage ratio for over the sample (e.g., Collin-Dufresne et al., 2001). Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. All variables are defined in Appendix A. These t-statistics capture cross-sectional variation in the time-series regression coefficient estimates as in Collin-Dufresne et al., (2001). Values of average t-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

Panel A

	Level						Changes					
	CDS		PD		DTD		CDS		PD		DTD	
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES												
Leverage_MVC	0.0163	0.0507***	0.069***	0.1109**	-2.9086***	-5.0613**	0.0142***	0.0191*	0.0522***	0.0367*	-2.605***	-1.7207
	(0.01)	(0.0197)	(0.0148)	(0.0439)	(1.0033)	(2.2515)	(0.0052)	(0.0113)	(0.0084)	(0.0196)	(0.4767)	(1.295)
leverage_X_crisis		0.0296		-0.0008		1.1166		0.0141		0.0242		-3.0818
		(0.0237)		(0.0203)		(3.4254)		(0.0127)		(0.0158)		(1.9559)
leverage_X_postcrisis		-0.0304		-0.0308		0.9561		-0.0051		0.0291		-1.061
		(0.0205)		(0.0396)		(2.2494)		(0.0129)		(0.0178)		(1.1576)
firmsd_12e	0.0207**	-0.2585	0.0633***	0.2079	-10.2474***	-42.1135	0.0049	0.0171	0.017*	0.024*	-4.8014***	-4.2144**
	(0.0091)	(0.2276)	(0.0166)	(0.1365)	(1.9593)	(32.6298)	(0.0066)	(0.0116)	(0.0095)	(0.0128)	(0.9438)	(1.6464)
firmsd_12e_X_crisis		-0.0241		0.0061		6.1472		-0.0325*		-0.0033		-6.3286
		(0.0198)		(0.0201)		(6.2882)		(0.0174)		(0.0183)		(5.4952)
firmsd_12e_X_postcrisis		0.302		-0.1854		35.2454		-0.0016		-0.0235		-0.7796
		(0.228)		(0.1373)		(32.7274)		(0.0174)		(0.0203)		(2.028)
INTCOV_DW	-0.0012	-0.0009	-0.0012**	-0.0013**	0.0729**	0.0474	-0.0003	-0.0004	0.0001	0.0001	0.0155	0.002
	(0.0009)	(0.0007)	(0.0006)	(0.0007)	(0.0301)	(0.0356)	(0.0004)	(0.0005)	(0.0004)	(0.0003)	(0.0144)	(0.0146)
PTBV	-0.0043***	-0.0039***	-0.0079***	-0.0093***	0.7009***	0.8495***	-0.0027***	-0.0027***	-0.0107***	-0.0111***	1.0117***	1.0419***
	(0.0009)	(0.0008)	(0.0015)	(0.0016)	(0.0913)	(0.0968)	(0.0006)	(0.0006)	(0.0014)	(0.0015)	(0.0788)	(0.0827)
ROA	0.3016	-0.3326	1.774	1.3644	-110.7961*	-90.0682	0.1318	0.2546	0.8705	1.0659	-29.7195	-45.2058
	(0.6427)	(0.6687)	(2.9819)	(3.0868)	(65.8307)	(58.9533)	(0.3532)	(0.388)	(1.1073)	(1.0945)	(49.4851)	(49.6843)
ROS	-0.03	0.0273	-0.2115	-0.0812	23.0645*	17.6196*	-0.0293	-0.0641	-0.141	-0.1637	6.805	7.1995
	(0.0778)	(0.0703)	(0.2413)	(0.2144)	(13.2735)	(9.6294)	(0.0465)	(0.0536)	(0.1191)	(0.1222)	(5.4841)	(5.5493)
Sales_to_Assets	-0.0893	0.0471	-0.4335	-0.3473	25.8155*	21.4568*	-0.0295	-0.0374	-0.2283	-0.2641	4.9052	8.417
	(0.1333)	(0.1433)	(0.561)	(0.5784)	(13.4623)	(12.6597)	(0.0732)	(0.0777)	(0.2142)	(0.2134)	(11.4025)	(11.511)
market_return	-0.0054***	-0.0064***	-0.0039***	-0.0026**	0.7155***	0.6457***	-0.0058***	-0.006***	-0.0003	0.0001	0.3061***	0.305***
	(0.0011)	(0.0012)	(0.0014)	(0.0013)	(0.0975)	(0.0926)	(0.0009)	(0.0009)	(0.0008)	(0.0009)	(0.072)	(0.0747)
sp500	-0.0113**	-0.0077**	0.0008	-0.0011	-0.2482	-0.339	0.0028	0.0042	0.0008	0.0008	-0.0807	-0.0446
	(0.0049)	(0.0038)	(0.0041)	(0.0037)	(0.2847)	(0.275)	(0.0029)	(0.003)	(0.0023)	(0.0023)	(0.1484)	(0.1543)
vix	0.0004***	0.0004***	0.0001*	0.0001*	-0.0134***	-0.0155***	0.0005***	0.0005***	0.0001**	0.0001**	-0.0101***	-0.0098***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0034)	(0.0033)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0021)	(0.0022)
def	0.0067***	0.0064***	0.0049***	0.0037***	-0.4681***	-0.3911***	0.0006	0.0005	0.0009**	0.0007*	-0.1052***	-0.1132***
	(0.0011)	(0.0009)	(0.0009)	(0.0008)	(0.0608)	(0.0548)	(0.0008)	(0.0008)	(0.0005)	(0.0004)	(0.0323)	(0.0323)
3mTBill	-0.0015	-0.0015	0.0042***	0.0039***	-0.1408	-0.1643	-0.0002	-0.0001	0.0028***	0.0026***	-0.0164	-0.0126
	(0.001)	(0.001)	(0.0015)	(0.0013)	(0.1994)	(0.2006)	(0.001)	(0.0009)	(0.001)	(0.001)	(0.1006)	(0.1015)
term	0.0001	0.0002	0.0027***	0.0027***	-0.1727***	-0.1498***	-0.0002	-0.0001	0.0017***	0.0016***	-0.0789***	-0.0694**
	(0.0007)	(0.0005)	(0.0008)	(0.0008)	(0.0576)	(0.0556)	(0.0005)	(0.0005)	(0.0004)	(0.0004)	(0.0303)	(0.0309)
TED	0.0026**	0.0025***	0.001	0.0009	-0.2504*	-0.1588	0.0047***	0.0045***	-0.0005	-0.0004	0.0108	0.0129
	(0.001)	(0.001)	(0.0012)	(0.0012)	(0.1451)	(0.1471)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0845)	(0.0856)
Constant	0.0204	0.0061	0.0464	0.033	1.5549	2.1886*	0.0001	0.0001*	-0.0001**	-0.0001**	0.0055*	0.0044
	(0.0134)	(0.0121)	(0.0339)	(0.0321)	(1.5842)	(1.2055)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0031)	(0.0034)
Observations	99	99	100	100	100	100	98	98	98	98	98	98
Adjusted R-squared	0.859	0.877	0.814	0.843	0.806	0.839	0.474	0.496	0.416	0.452	0.384	0.419

Panel B

	Changes											
	CDS				PD				DTD			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
VARIABLES	Lowest Lev	Lev II	Lev III	Highest Lev	Lowest Lev	Lev II	Lev III	Highest Lev	Lowest Lev	Lev II	Lev III	Highest Lev
Leverage_MVC	0.2427	0.0106	-0.0091	0.0758*	-0.2024	-0.0965	0.0351	0.071*	11.7584	16.3254	-7.1216***	-2.4921
	(0.2312)	(0.0944)	(0.0208)	(0.0415)	(0.1672)	(0.1129)	(0.0371)	(0.0397)	(11.353)	(11.3487)	(2.6346)	(1.5521)
leverage_X_crisis	0.1564	0.1165	0.0055	0.0357	0.1141	-0.0095	0.0363	0.0401	-40.3854	-12.2639	-1.861	-1.4018
	(0.2446)	(0.0884)	(0.0262)	(0.0791)	(0.1052)	(0.05)	(0.0654)	(0.032)	(38.4102)	(11.0749)	(2.8803)	(3.3106)
leverage_X_postcrisis	-0.0337	-0.0133	-0.013	-0.0284	0.0182	0.1495	0.0339	0.0451*	15.6229	-20.185	-0.4429	-3.4322
	(0.0761)	(0.104)	(0.0295)	(0.0671)	(0.0905)	(0.1212)	(0.0606)	(0.027)	(21.7559)	(12.3406)	(2.6987)	(2.5917)
firmsd_12e	0.0278	0.0691	0.0403	-0.0002	0.0127	0.0804*	-0.0602	0.0175	-14.4654*	-13.741***	-8.1043	-10.1488
	(0.0403)	(0.0862)	(0.0545)	(0.1062)	(0.0193)	(0.0464)	(0.1189)	(0.0789)	(7.7251)	(4.8865)	(9.0071)	(8.4804)
firmsd_12e_X_crisis	-0.0375	-0.1537	-0.0511	-0.1396	0.0074	-0.057	0.0701	-0.0257	5.8873	-37.9265	7.3075	10.6642
	(0.0611)	(0.1114)	(0.1427)	(0.1727)	(0.0347)	(0.0764)	(0.1078)	(0.1467)	(9.8603)	(37.3385)	(11.2033)	(11.3156)
firmsd_12e_X_postcrisis	-0.0144	-0.0229	-0.0184	0.0366	0.0183	-0.0228	0.055	-0.0226	-10.4541	5.3062	8.8939	13.6707
	(0.0455)	(0.0857)	(0.0768)	(0.1335)	(0.0287)	(0.0464)	(0.1775)	(0.1026)	(18.2175)	(6.2478)	(10.3766)	(10.8697)
INTCOV_DW	0.0017	-0.0002	0.001*	0.0049	-0.0045	-0.0003	0.0005	0.0002	-0.0076	0.0131	0.0761*	0.1467**
	(0.0042)	(0.0006)	(0.0006)	(0.005)	(0.0036)	(0.0005)	(0.0006)	(0.0011)	(0.229)	(0.0416)	(0.0404)	(0.06)
PTBV	-0.0033***	-0.0034***	-0.0042***	-0.0043	-0.0085**	-0.0068***	-0.0112***	-0.0247***	0.8449***	1.0324***	1.0333***	1.1351***
	(0.0009)	(0.0013)	(0.0016)	(0.0028)	(0.0037)	(0.002)	(0.0031)	(0.0054)	(0.1145)	(0.1894)	(0.1537)	(0.1573)
ROA	15.5395	-2.3317	0.6417	-2.2791	-12.5392	1.6482*	1.5321**	2.0779**	522.271	-235.9484*	7.1084	-40.3476
	(14.7237)	(3.444)	(0.7535)	(2.4365)	(8.1841)	(0.8412)	(0.7801)	(1.0476)	(650.579)	(134.5985)	(32.7556)	(64.0998)
ROS	-0.9558	0.2121	-0.0618	2.1547	1.0744	-0.1781*	-0.6896	-1.6465	-27.5925	28.8439*	14.6224	-5.6859
	(1.0862)	(0.2181)	(0.1593)	(2.4767)	(0.6983)	(0.0941)	(0.4457)	(1.0951)	(50.3681)	(16.032)	(21.9398)	(41.8946)
Sales_to_Assets	-1.0411	0.5408	-0.1207	0.0347	1.0978	-0.2789*	-0.1612	-0.013	-30.9673	41.7092	-2.9352	2.8453
	(0.9404)	(0.8087)	(0.1241)	(0.0913)	(0.6824)	(0.1574)	(0.1284)	(0.0576)	(52.3765)	(29.0254)	(3.0219)	(3.9572)
market_return	-0.005***	-0.0074***	-0.0076***	-0.0049***	-0.0019	0.0001	0.002	0.0016	0.5096***	0.2756*	0.3323**	0.1404**
	(0.0015)	(0.0018)	(0.0014)	(0.0019)	(0.0013)	(0.0016)	(0.0018)	(0.0022)	(0.1298)	(0.1523)	(0.1416)	(0.0712)
sp500	0.003	0.0003	0.0044	-0.0048	-0.0007	0.0088**	-0.0022	0.003	-0.1942	-0.4981	-0.3608	-0.3413
	(0.0036)	(0.0061)	(0.0049)	(0.0081)	(0.0028)	(0.0044)	(0.0055)	(0.006)	(0.4874)	(0.401)	(0.3369)	(0.2878)
vix	0.0004***	0.0005***	0.0004***	0.0004***	0.0001	0.0002***	0.0001	-0.0001	-0.0157***	-0.0205***	-0.0172***	-0.0062*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0049)	(0.0048)	(0.0051)	(0.0037)
def	0.0004	-0.0004	-0.0006	0.0024	0.0015**	-0.0016	0.0008	0.0005	-0.0868	-0.0335	-0.0156	-0.0371
	(0.0007)	(0.0011)	(0.001)	(0.0017)	(0.0006)	(0.001)	(0.0015)	(0.0019)	(0.0712)	(0.0996)	(0.134)	(0.0654)
3mTBill	0.0007	0.0042	-0.0015	0.0025	0.0005	0.004**	0.0021*	0.0006	0.1413	-0.2575	-0.3367	-0.0827
	(0.0012)	(0.0036)	(0.0025)	(0.0053)	(0.0005)	(0.002)	(0.0013)	(0.006)	(0.1418)	(0.2383)	(0.2168)	(0.2)
term	0.0001	0.0003	0.0005	-0.0006	0.0007	0.001	0.0005	0.0026*	-0.064	0.0776	0.0919	-0.048
	(0.0007)	(0.0007)	(0.0007)	(0.0009)	(0.0007)	(0.0007)	(0.0007)	(0.0014)	(0.0755)	(0.0729)	(0.0787)	(0.0475)
TED	0.0033**	0.0044	0.0048**	0.0086**	-0.0004	0.0006	0.0007	-0.0042	0.155	-0.1168	0.0334	0.183**
	(0.0014)	(0.0028)	(0.0021)	(0.0041)	(0.0009)	(0.0019)	(0.0006)	(0.0034)	(0.1281)	(0.174)	(0.0464)	(0.0862)
Constant	0.0001	-0.0002	-0.0001	-0.0001	0.0001	0.0001	-0.0002*	-0.0004	0.0085	0.0094	0.0078	0.0123*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0086)	(0.0077)	(0.0072)	(0.0066)
Observations	92	72	73	74	89	72	74	72	89	72	74	72
Adjusted R-squared	0.578	0.582	0.578	0.552	0.428	0.474	0.546	0.574	0.403	0.436	0.474	0.479

Table XI: Panel regressions of credit risk by region

This table reports the results of monthly panel regressions of credit risk proxies (in changes) separately for the three emerging market regions using the data for the period 2002-15. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

	Asia			EMEA			Latin America		
	Changes								
	CDS	PD	DTD	CDS	PD	DTD	CDS	PD	DTD
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Leverage_MVC	0.00948*	0.0215**	-0.529	-0.00295	0.00947	-4.402***	0.000847	0.0108	-1.079
	(0.00505)	(0.0103)	(0.550)	(0.00877)	(0.0159)	(0.699)	(0.0119)	(0.00894)	(1.005)
leverage X crisis	0.00455	0.0123**	-0.471	0.000780	-0.0105**	2.006***	-0.000347	0.0526***	-1.598
	(0.00399)	(0.00543)	(0.348)	(0.00528)	(0.00491)	(0.548)	(0.0191)	(0.0126)	(1.224)
leverage X postcrisis	-0.00168	0.0170*	-0.983**	0.0139	0.00965	3.029***	0.000692	0.0448***	-0.742
	(0.00509)	(0.00869)	(0.430)	(0.0133)	(0.0200)	(0.599)	(0.00853)	(0.0125)	(1.210)
firmsd_12e	0.0304**	0.0450***	-3.834***	0.00385	-0.00479	0.817	0.0265	0.100***	-5.422**
	(0.0133)	(0.0130)	(0.867)	(0.0156)	(0.0181)	(1.524)	(0.0171)	(0.0252)	(2.398)
firmsd_12e X crisis	-0.00124	-0.0179	0.781	-0.0401**	0.0153	-3.802**	0.0133	-0.0538**	3.285
	(0.00841)	(0.0131)	(0.735)	(0.0165)	(0.0171)	(1.522)	(0.0278)	(0.0246)	(2.338)
firmsd_12e X postcrisis	-0.0127	-0.0428**	1.754**	-0.0434	0.0299	-5.061***	0.0129	-0.0311	1.854
	(0.0103)	(0.0173)	(0.838)	(0.0286)	(0.0327)	(1.636)	(0.0193)	(0.0292)	(2.480)
INTCOV_DW	1.05e-05	-1.29e-06	0.00136	-3.40e-05***	-6.99e-06	0.000280	-0.000111**	1.21e-05	-8.82e-05
	(1.04e-05)	(6.19e-06)	(0.00122)	(4.62e-06)	(5.11e-06)	(0.000247)	(5.01e-05)	(1.88e-05)	(0.000470)
Sales_to_Assets	-0.00140	0.00486**	-0.113	0.00921	-0.0100	0.276	0.00230	-0.000131	0.178
	(0.00167)	(0.00207)	(0.0687)	(0.0121)	(0.00704)	(0.292)	(0.00403)	(0.00265)	(0.220)
ROS	-0.00230	-0.00131	-0.0130	0.00310	0.00398	-0.334	0.000110	0.00232	-0.226
	(0.00492)	(0.00494)	(0.150)	(0.00660)	(0.00397)	(0.242)	(0.00449)	(0.00609)	(0.233)
ROA	-0.00941	-0.0100	0.836*	-0.0373**	0.0165	1.516**	-0.0479	-0.0471**	1.640*
	(0.0106)	(0.0149)	(0.462)	(0.0161)	(0.0211)	(0.563)	(0.0367)	(0.0181)	(0.870)
PTBV	-0.00172***	-0.00929***	0.456***	-0.000923	-0.00337***	0.315**	-0.00123*	-0.00384***	0.356***
	(0.000519)	(0.00131)	(0.0561)	(0.000924)	(0.00122)	(0.136)	(0.000663)	(0.000812)	(0.0640)
market_returns	-0.00581***	-0.00512***	0.454***	-0.00816***	-0.00315**	0.653***	-0.00746***	-0.00343*	0.595***
	(0.00130)	(0.00149)	(0.0555)	(0.00249)	(0.00122)	(0.110)	(0.00181)	(0.00191)	(0.110)
sp500	-0.00175	0.00174	0.108	-0.0111	-0.00212	-0.00447	-0.00970**	-0.00588	0.132
	(0.00366)	(0.00315)	(0.149)	(0.0118)	(0.00355)	(0.282)	(0.00401)	(0.00367)	(0.246)
vix	0.000453***	0.000132***	-0.0116***	0.000138	9.24e-05**	-0.0135***	0.000365***	7.07e-05	-0.0120***
	(4.89e-05)	(3.96e-05)	(0.00194)	(0.000132)	(4.20e-05)	(0.00394)	(5.55e-05)	(5.42e-05)	(0.00308)
default	0.00437***	0.00126*	-0.167***	0.00539***	0.00145	-0.243***	0.00426***	0.00209**	-0.286***
	(0.00128)	(0.000724)	(0.0245)	(0.00155)	(0.000892)	(0.0526)	(0.00116)	(0.000813)	(0.0614)
FRTBS3M	-0.00248***	5.87e-05	0.0430*	-0.00312***	-0.000657	-0.0253	-0.00427***	0.000116	0.0561
	(0.000521)	(0.000501)	(0.0239)	(0.00103)	(0.000682)	(0.0342)	(0.00133)	(0.000732)	(0.0709)
slope	-0.00109**	0.00269***	-0.0617**	-0.000704	5.14e-05	-0.0557	-0.000354	0.000926	-0.0865
	(0.000538)	(0.000497)	(0.0263)	(0.00159)	(0.000711)	(0.0488)	(0.000602)	(0.000718)	(0.0646)
ted	0.00242***	0.000553	0.0474**	1.74e-05	-0.000855	0.0485	0.000728	0.000276	0.0286
	(0.000605)	(0.000399)	(0.0185)	(0.00103)	(0.000630)	(0.0299)	(0.000996)	(0.000668)	(0.0392)
Constant	0.000116***	-4.65e-05**	0.00492***	2.78e-05	-5.14e-05	-0.00462***	0.000301***	0.000132***	0.00168
	(2.32e-05)	(2.09e-05)	(0.000932)	(3.69e-05)	(5.33e-05)	(0.00146)	(4.90e-05)	(3.75e-05)	(0.00217)
Observations	11,054	12,174	12,174	1,930	2,260	2,260	3,170	3,487	3,487
Adjusted R-squared	0.157	0.127	0.132	0.0596	0.0642	0.191	0.141	0.112	0.115

Table XII: Time series regressions using principal components by region

This table reports the monthly time-series regressions using PD (in changes) separately for the three emerging market regions using the data for the period 2002-15. We first extract principal component of all the credit risk proxies and balance sheet variables of all firms for each country over time and use the first principal components in the time series regressions. Explanatory variables include country-specific principal comments of leverage, volatility and other firm-specific characteristics; in addition to aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-country correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

	PD								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES		Asia			EMEA			Latin America	
pc1_dcn_Leverage_MVC	-0.0794	-0.0707	-0.0896*	0.133	0.134	0.0626	-0.102	-0.0997	-0.0707
	(0.0523)	(0.0527)	(0.0489)	(0.0849)	(0.0858)	(0.0725)	(0.102)	(0.101)	(0.0838)
Leverage X crisis	0.365***	0.377***	0.291***	0.0568	0.0679	0.0657	0.157	0.150	-0.0190
	(0.0895)	(0.0916)	(0.0793)	(0.116)	(0.119)	(0.105)	(0.161)	(0.160)	(0.148)
leverage X postcrisis	0.225***	0.230***	0.207***	-0.0737	-0.0800	-0.0332	0.00372	0.00412	-0.0106
	(0.0736)	(0.0739)	(0.0686)	(0.104)	(0.104)	(0.0866)	(0.120)	(0.119)	(0.100)
pc1_dcn_firmsd_12e	-0.0548	-0.0360	-0.0266	-0.0953	-0.0941	-0.172**	-0.0903	-0.0963	-0.0805
	(0.107)	(0.106)	(0.0976)	(0.0856)	(0.0842)	(0.0819)	(0.145)	(0.145)	(0.133)
pc1_dcn_firmsd_12e X crisis	0.197	0.179	0.156	-0.0405	-0.0422	0.0253	0.290	0.292	0.212
	(0.131)	(0.131)	(0.122)	(0.145)	(0.144)	(0.122)	(0.183)	(0.184)	(0.170)
pc1_dcn_firmsd_12e X postcrisis	0.188	0.171	0.139	0.117	0.119	0.226**	0.164	0.180	0.127
	(0.119)	(0.119)	(0.113)	(0.115)	(0.114)	(0.104)	(0.166)	(0.167)	(0.146)
market_return	-0.175***	-0.173***	-0.0609*	-0.351***	-0.351***	-0.140***	-0.214***	-0.214***	-0.0602*
	(0.0332)	(0.0332)	(0.0321)	(0.0347)	(0.0347)	(0.0404)	(0.0308)	(0.0308)	(0.0349)
sp500	7.385*	7.200*	7.746**	-2.802	-2.765	-2.013	-7.497*	-7.175*	-5.547
	(3.877)	(3.850)	(3.701)	(2.338)	(2.336)	(1.953)	(3.833)	(3.802)	(3.537)
Dvix	0.190***	0.188***	0.173***	0.0141	0.0144	0.00374	-0.0268	-0.0247	-0.0282
	(0.0398)	(0.0393)	(0.0379)	(0.0188)	(0.0188)	(0.0160)	(0.0256)	(0.0256)	(0.0242)
ar1	0.107**	0.105**	0.108**	0.0559	0.0570	0.0689*	0.158***	0.153***	0.169***
	(0.0527)	(0.0526)	(0.0535)	(0.0447)	(0.0449)	(0.0407)	(0.0523)	(0.0521)	(0.0469)
pc1_dcn_INTCOV_DW		0.0424			0.0402			-0.0502	
		(0.0384)			(0.0446)			(0.0444)	
pc1_dcn_PTBV			-0.252***			-0.463***			-0.435***
			(0.0492)			(0.0652)			(0.0490)
Constant	-0.0557	-0.0555	-0.0500	0.0194	0.0195	0.0152	0.0404	0.0387	0.0295
	(0.0597)	(0.0598)	(0.0584)	(0.0401)	(0.0401)	(0.0351)	(0.0626)	(0.0625)	(0.0575)
Observations	1,187	1,187	1,187	921	921	921	671	671	671
Adjusted R-squared	0.362	0.363	0.394	0.265	0.266	0.410	0.220	0.221	0.339

Table XIII: Cross-sectional averages of monthly time-series regressions by region

This table reports the cross-sectional averages of monthly time-series regressions of each firm following Collin-Dufresne et al., (2001). Firm-specific time-series regression is conducting using three credit risk proxies i.e. CDS spreads, PD and DTD (in changes) separately for the three emerging market regions using the data for the period 2002-15. We then calculate cross-sectional average of time series coefficients across all firms. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. All variables are defined in Appendix A. These t-statistics capture cross-sectional variation in the time-series regression coefficient estimates as in Collin-Dufresne et al., (2001). Values of average t-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

	Asia			EMEA			Latin America		
	Changes								
	CDS	PD	DTD	CDS	PD	DTD	CDS	PD	DTD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES									
Leverage_MVC	0.016	0.04	-2.0397	0.0106	0.0309***	-4.2989***	0.0361	0.0268	2.0196
	(0.0147)	(0.0272)	(1.3797)	(0.0244)	(0.0111)	(1.2727)	(0.0221)	(0.0294)	(5.3858)
leverage_X_crisis	0.0283*	0.0193	-3.3198	0.0028	0.0055	0.2141	-0.0356	0.0593***	-4.9891**
	(0.0164)	(0.0225)	(2.8026)	(0.0264)	(0.0151)	(2.0565)	(0.0221)	(0.0189)	(2.2671)
leverage_X_postcrisis	-0.0099	0.0303	-0.6729	0.0537	0.0048	2.5234	-0.0289	0.0434***	-5.1916
	(0.016)	(0.0262)	(1.321)	(0.037)	(0.0149)	(1.5506)	(0.0249)	(0.0149)	(3.7409)
firmsd_12e	0.0178*	0.0261*	-4.8661**	0.0588	-0.0353	1.1326	-0.0138	0.0686***	-6.2911*
	(0.0103)	(0.0159)	(2.1703)	(0.0583)	(0.0328)	(2.6962)	(0.0294)	(0.025)	(3.3111)
firmsd_12e_X_crisis	-0.0404*	0.0124	-2.2033	-0.0932*	-0.0132	-1.4835	0.0426	-0.0584*	-27.3607
	(0.021)	(0.0219)	(2.4781)	(0.0562)	(0.0629)	(4.9512)	(0.0298)	(0.0307)	(31.0318)
firmsd_12e_X_postcrisis	0.0112	-0.0307	-1.176	-0.1316*	0.0167	-3.8664	0.0545	-0.0323	3.5231
	(0.0147)	(0.028)	(2.6423)	(0.0801)	(0.0415)	(3.117)	(0.0446)	(0.0267)	(5.0471)
INTCOV_DW	-0.0003	0.0004	-0.0011	-0.0004	0.0003	0.0313	-0.0008	-0.0011	-0.0104
	(0.0006)	(0.0004)	(0.0208)	(0.0003)	(0.0003)	(0.0201)	(0.0009)	(0.001)	(0.0174)
PTBV	-0.0033***	-0.0116***	1.0581***	-0.0043**	-0.0091***	1.021***	0.0002	-0.0111***	0.9987***
	(0.0007)	(0.0019)	(0.0852)	(0.0017)	(0.0017)	(0.1485)	(0.0009)	(0.0037)	(0.3091)
ROA	0.4978	1.8091	-55.5347	-0.6689	0.2531*	32.2143*	-0.0015	-1.0293	-68.0401
	(0.5428)	(1.596)	(72.7572)	(0.7309)	(0.1304)	(17.88)	(0.4371)	(1.0881)	(44.3682)
ROS	-0.0397	-0.297*	10.3057	-0.0392	-0.0715	-5.744	-0.1615	0.2542	5.9431
	(0.0696)	(0.1689)	(7.9863)	(0.0903)	(0.0453)	(3.6891)	(0.116)	(0.2291)	(6.8107)
Sales_to_Assets	-0.0854	-0.3991	9.0722	0.1808	-0.0565***	-2.8918	-0.0088	0.0692	14.8921
	(0.1094)	(0.3155)	(16.8598)	(0.1494)	(0.02)	(2.8555)	(0.0726)	(0.0999)	(10.7458)
market_return	-0.0059***	0.0004	0.2573**	-0.0064***	-0.0008	0.3129***	-0.006***	-0.0008	0.4741***
	(0.0011)	(0.001)	(0.1012)	(0.0022)	(0.0014)	(0.1098)	(0.0019)	(0.0027)	(0.1423)
sp500	0.0033	0.0002	0.1541	0.0045	0.0002	-0.4627**	0.0067	0.0036	-0.4465
	(0.0036)	(0.003)	(0.1975)	(0.0065)	(0.0033)	(0.2263)	(0.0075)	(0.0044)	(0.3767)
vix	0.0005***	0.0001	-0.0092***	0.0003***	0.0001	-0.0129***	0.0005***	0.0001**	-0.0097***
	(0.0001)	(0.0001)	(0.003)	(0.0001)	(0.0001)	(0.0041)	(0.0001)	(0.0001)	(0.003)
def	0.0005	0.0008	-0.0941***	0.003**	0.0008*	-0.1196**	-0.001	0.0004	-0.1786
	(0.001)	(0.0006)	(0.0333)	(0.0014)	(0.0005)	(0.0509)	(0.0015)	(0.0008)	(0.1216)
3mTBill	0.0007	0.0014	0.1097	-0.0015	0.0011	-0.3157**	-0.0015	0.0083***	-0.2239
	(0.0011)	(0.0011)	(0.1371)	(0.0015)	(0.0016)	(0.1398)	(0.0028)	(0.0031)	(0.1931)
term	0.0005	0.0019***	-0.0442	-0.0024**	0.0003	-0.0937*	-0.0005	0.0015*	-0.1429
	(0.0006)	(0.0005)	(0.0349)	(0.0011)	(0.0007)	(0.0551)	(0.001)	(0.0008)	(0.1014)
TED	0.0054***	-0.0006	0.0956	-0.0001	0.001	-0.2387*	0.0043**	-0.0008	-0.0941
	(0.0012)	(0.0012)	(0.1184)	(0.0009)	(0.0009)	(0.1308)	(0.002)	(0.0014)	(0.131)
Constant	0.0001	-0.0002**	0.0094**	0.0001	-0.0001	-0.0104	0.0003	0.0001	-0.0028
	(0.0001)	(0.0001)	(0.0039)	(0.0002)	(0.0001)	(0.01)	(0.0002)	(0.0001)	(0.0078)
Observations	99	99	99	99	95	95	93	99	99
Adjusted R-squared	0.540	0.455	0.411	0.338	0.520	0.451	0.445	0.386	0.425

Table XIV: Effect of firm size on credit risk

This table reports effect of firm size on panel regressions in Table VII. We employ a triple interaction of leverage x post-crisis x large firm, where large firm dummy is set to 1 for the largest two quartiles of firm size; and zero otherwise. We employ credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15 and study. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. We do not report control variables for brevity. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

VARIABLES	(1) Level Spread5y	(2) Level pd_12_month	(3) Level dtd	(4) Change Spread5y	(5) Change pd_12_month	(6) Change dtd
Leverage_MVC	0.0237***	0.0107***	-1.465*	0.00764*	0.00746**	-0.907*
	-0.00836	-0.00317	-0.768	-0.00461	-0.00305	-0.547
leverage X crisis	0.0105	0.00718***	-1.329**	0.00351	0.00659***	-0.278
	-0.00902	-0.00248	-0.651	-0.00413	-0.00183	-0.362
leverage X postcrisis	0.0112	0.00947**	-1.638**	-0.0000393	0.00906***	-0.516
	-0.00999	-0.00449	-0.703	-0.00546	-0.00272	-0.434
firmsd X 12e	0.138***	0.0266***	-11.09***	0.0274**	0.0112***	-3.601***
	-0.0234	-0.00724	-1.821	-0.0111	-0.00364	-0.791
firmsd X 12e X crisis	-0.0295	-0.00477	3.094*	-0.000374	-0.00351	0.79
	-0.0216	-0.0053	-1.662	-0.00789	-0.00339	-0.711
firmsd X 12e X postcrisis	-0.0162	0.000969	3.410*	-0.00919	-0.00566	1.447*
	-0.029	-0.0122	-1.965	-0.0101	-0.00575	-0.821
dlev X postcrisis X largefirm	0.00025	-0.00411	-0.143	0.000548	-0.00962**	-0.503
	-0.00902	-0.00466	-0.697	-0.00847	-0.00403	-0.543
dvol X postcrisis X largefirm	-0.0352	-0.0136	5.694***	-0.00693	-0.00829	-1.959**
	-0.027	-0.0124	-1.771	-0.0156	-0.00678	-0.981
Constant	0.0121***	0.00370***	5.365***	0.000149***	0.00000902	0.00285***
	-0.0033	-0.00135	-0.29	-0.0000202	-0.00000775	-0.000812
Observations	16719	18261	18261	16154	17921	17921
Adjusted R-squared	0.389	0.237	0.329	0.139	0.098	0.132

Table XV: Effect of growth factor (Q ratio) on credit risk

This table reports effects of q ratios on panel regressions in Table VII. We employ a triple interaction of leverage x post-crisis x large q, where large q dummy is set to 1 for the largest two quartiles of q ratio; and zero otherwise. We employ credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15 and study. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. We do not report control variables for brevity. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

VARIABLES	(1) Level Spread5y	(2) Level pd_12_month	(3) Level dtd	(4) Change Spread5y	(5) Change pd_12_month	(6) Change dtd
Leverage_MVC	0.0239***	0.0110***	-1.542**	0.00875*	0.00729**	-0.898*
	(0.00831)	(0.00318)	(0.764)	(0.00456)	(0.00296)	(0.539)
leverage X crisis	0.00943	0.00664***	-1.194*	0.00423	0.00653***	-0.259
	(0.00896)	(0.00242)	(0.645)	(0.00401)	(0.00181)	(0.362)
leverage X postcrisis	0.0114	0.00702*	-1.391*	0.00211	0.00912***	-0.408
	(0.00928)	(0.00377)	(0.738)	(0.00471)	(0.00286)	(0.436)
firmsd_12e	0.136***	0.0271***	-11.03***	0.0302***	0.0107***	-3.621***
	(0.0233)	(0.00743)	(1.833)	(0.0108)	(0.00373)	(0.793)
firmsd_12e_crisis	-0.0298	-0.00544	3.207*	8.35e-05	-0.00377	0.745
	(0.0216)	(0.00541)	(1.662)	(0.00790)	(0.00342)	(0.715)
firmsd X 12e_postcrisis	-0.0141	0.00364	2.873	-0.00882	-0.00674	1.181
	(0.0303)	(0.0112)	(2.038)	(0.00918)	(0.00551)	(0.819)
dlev X postcrisis X large q	-0.00561	0.00211	-0.356	-0.0160	-0.0118**	-1.161**
	(0.00749)	(0.00433)	(0.634)	(0.00997)	(0.00517)	(0.590)
dvol X postcrisis X large q	-0.0349	-0.0175	6.187***	-0.0215	-0.00137	-0.803
	(0.0269)	(0.0114)	(1.731)	(0.0165)	(0.00670)	(0.886)
Constant	0.0106***	0.00274**	5.591***	0.000143***	8.58e-06	0.00284***
	(0.00334)	(0.00139)	(0.287)	(1.99e-05)	(7.98e-06)	(0.000850)
Observations	16,719	18,261	18,261	16,154	17,921	17,921
Adjusted R-squared	0.390	0.234	0.330	0.140	0.0980	0.132

Table XVI: Industry effects on credit risk

This table reports the industry effects on panel regressions in Table VII. We employ a triple interaction of leverage x post-crisis x industry type, where industry type is captured using two dummies: (a) finance dummy i.e.1 for all financial forms and zero otherwise; (b) tradable sector dummy i.e. 1 for tradeable sector (Industrials, oil and gas, and Technology) and zero for non-tradable sectors (construction, transportation, communications, utilities, wholesale/retail trade, and services). Panel A presents industry effects for the overall sample; while Panel B presents region specific industry effects. We employ credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15 and study. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. We do not report control variables for brevity. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

Panel A

VARIABLES	(1) Level Spread5y	(2) Level pd_12_month	(3) Level dtd	(4) Change Spread5y	(5) Change pd_12_month	(6) Change dtd
Leverage_MVC	0.0231***	0.0118***	-1.554**	0.00762*	0.00666**	-0.967*
	(0.00822)	(0.00339)	(0.782)	(0.00421)	(0.00267)	(0.554)
leverage X crisis	0.0103	0.00613**	-1.212*	0.00332	0.00607***	-0.303
	(0.00859)	(0.00236)	(0.651)	(0.00391)	(0.00173)	(0.373)
leverage X postcrisis	0.0154	0.00259	-2.085**	-6.51e-05	0.00714***	-0.537
	(0.0145)	(0.00351)	(0.865)	(0.00423)	(0.00244)	(0.458)
firmsd X 12e	0.137***	0.0278***	-11.74***	0.0271***	0.00958***	-3.779***
	(0.0229)	(0.00753)	(1.883)	(0.0102)	(0.00343)	(0.794)
firmsd X 12e X crisis	-0.0287	-0.00422	3.193*	-0.000964	-0.00364	0.734
	(0.0221)	(0.00529)	(1.667)	(0.00777)	(0.00330)	(0.715)
firmsd X 12e X postcrisis	-0.0232	-0.00463	6.392**	-0.00909	-0.00452	1.173
	(0.0420)	(0.00935)	(2.661)	(0.00864)	(0.00493)	(0.811)
dlev X postcrisis X Financials	0.0275	-0.00230	0.957	0.00125	0.000558	-0.0347
	(0.0214)	(0.00583)	(1.216)	(0.00125)	(0.000674)	(0.0692)
dvol X postcrisis X Financials	0.0464	0.0163	-1.853	-0.000462	0.000646	-0.0766
	(0.0569)	(0.0269)	(2.905)	(0.00380)	(0.00154)	(0.157)
dlev X postcrisis X tradable	0.000477	0.0137**	0.177	0.000330	0.00212***	-0.107
	(0.0191)	(0.00641)	(0.856)	(0.00189)	(0.000650)	(0.101)
dvol X postcrisis X tradable	-0.0607	-0.00695	-1.419	-0.00507*	-0.00318**	0.255
	(0.0532)	(0.0109)	(2.716)	(0.00282)	(0.00151)	(0.278)
Constant	0.00961***	0.00285**	5.570***	0.000224***	-7.24e-06	0.00177
	(0.00336)	(0.00127)	(0.290)	(7.74e-05)	(2.14e-05)	(0.00262)
Observations	16,719	18,261	18,261	16,154	17,921	17,921
Adjusted R-squared	0.320	0.153	0.360	0.143	0.0997	0.133

Panel B

VARIABLES	(1) Asia Change Spread5y	(2) Asia Change pd_12_month	(3) Asia Change dtd	(4) EMEA Change Spread5y	(5) EMEA Change pd_12_month	(6) EMEA Change dtd	(7) LatinAmerica Change Spread5y	(8) LatinAmerica Change pd_12_month	(9) LatinAmerica Change dtd
Leverage_MVC	0.0106*	0.00695**	-0.532	-0.00122	-0.000577	-4.431***	0.0023	0.00466	-1.045
	-0.00548	-0.00351	-0.549	-0.00869	-0.00817	-0.68	-0.0121	-0.00298	-0.994
leverage X crisis	0.00481	0.00602***	-0.479	0.000813	-0.00535*	2.029***	0.000229	0.0151***	-1.646
	-0.00409	-0.00194	-0.346	-0.00544	-0.00279	-0.54	-0.0192	-0.00428	-1.208
leverage X postcrisis	-0.00124	0.00673**	-0.980**	0.011	0.00742	3.078***	0.00304	0.0137***	-0.88
	-0.00515	-0.00281	-0.428	-0.0112	-0.00975	-0.583	-0.00952	-0.00513	-1.203
firmsd X 12e	0.0329**	0.00872**	-3.790***	0.00591	-0.00682	0.854	0.0300*	0.0267***	-5.482**
	-0.0134	-0.00412	-0.862	-0.0149	-0.00832	-1.498	-0.0171	-0.00767	-2.377
firmsd X 12e X crisis	-0.00403	-0.00476	0.717	-0.0405**	0.0152*	-3.922***	0.015	-0.0122	3.244
	-0.00832	-0.0039	-0.73	-0.0169	-0.00785	-1.517	-0.0276	-0.00782	-2.323
firmsd X 12e X postcrisis	-0.0131	-0.00942*	1.646**	-0.0378	0.0157	-5.263***	0.0119	-0.00801	2.156
	-0.0104	-0.00547	-0.832	-0.0258	-0.014	-1.637	-0.0206	-0.0107	-2.473
dlev X postcrisis X Financials	0.000397	-0.0004	0.0381	-0.00146	0.000859	-0.00954	0.000712	0.00022	0.117
	-0.000326	-0.000302	-0.0334	-0.00233	-0.000752	-0.0962	-0.000641	-0.000363	-0.161
dvol X postcrisis X Financials	-0.00455***	0.00177**	-0.138*	-0.00037	-0.00327	0.0715	0.00402	0.00363	-0.94
	-0.00124	-0.000777	-0.0823	-0.00798	-0.00208	-0.209	-0.00343	-0.00399	-1.049
dlev X postcrisis X tradable	0.000249	0.00144**	0.0127	0.00274	0.0000453	-0.234***	0.00117	0.00131**	-0.262**
	-0.00179	-0.000585	-0.0753	-0.00212	-0.00055	-0.0852	-0.00254	-0.000666	-0.106
dvol X postcrisis X tradable	-0.00544***	-0.00148	0.021	-0.0136	-0.00204	1.199	0.0107**	-0.00011	0.572
	-0.00202	-0.000932	-0.187	-0.0115	-0.00307	-0.804	-0.00477	-0.00227	-0.375
Constant	0.000259***	-0.0000264	0.00419	0.000154	0.00000613	-0.0086	0.0000253	-0.0000189	0.00425
	-0.0000723	-0.0000181	-0.0033	-0.000164	-0.0000211	-0.00615	-0.000125	-0.0000306	-0.00764
Observations	11054	12174	12174	1930	2260	2260	3170	3487	3487
Adjusted R-squared	0.162	0.114	0.134	0.0753	0.0827	0.199	0.152	0.111	0.124

Table XVII: Effects of Capital flows and external debt size on credit risk

This table reports the effects of two country specific variables i.e., capital flows and external debt (source: Oxford Economics, Datastream) on panel regressions in Table VII. We employ a triple interaction of leverage x post-crisis x capital flows or external debt. Capital flows is captured using non-foreign direct investment net capital flow (non-fdi), which measures the monetary value of capital inflow net of capital outflow other than foreign direct investment. External debt (netdebt) is measured as the outstanding amount of debt owed to non-residents as a % of GDP. We employ credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15 and study. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. We do not report control variables for brevity. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

VARIABLES	(1) Change Spread5y	(2) Change Spread5y	(3) Change Spread5y	(4) Change pd_12_month	(5) Change pd_12_month	(6) Change dtd	(7) Change dtd	(8) Change dtd
Leverage_MVC	0.00462	0.00461	0.00618	0.00636**	0.0102***	-0.793	-0.819	-1.561***
	(0.00343)	(0.00347)	(0.00521)	(0.00263)	(0.00254)	(0.524)	(0.539)	(0.385)
leverage X crisis	0.00198	0.00139	0.00203	0.00532***	0.00442**	-0.360	-0.352	0.0706
	(0.00325)	(0.00332)	(0.00370)	(0.00158)	(0.00188)	(0.351)	(0.359)	(0.361)
leverage X postcrisis	-0.00373	-0.00273	-0.00281	0.00622**	0.00475*	-0.604	-0.606	-0.0880
	(0.00390)	(0.00432)	(0.00465)	(0.00241)	(0.00242)	(0.434)	(0.447)	(0.389)
firmsd X 12e	0.0135	0.0143	0.0125	0.00951***	0.00843**	-3.619***	-3.767***	-3.206***
	(0.00889)	(0.00919)	(0.00961)	(0.00339)	(0.00390)	(0.832)	(0.869)	(0.940)
firmsd X 12e X crisis	-0.00172	-0.000980	-0.00125	-0.00200	-0.000836	0.583	0.669	0.213
	(0.00720)	(0.00735)	(0.00857)	(0.00320)	(0.00395)	(0.729)	(0.759)	(0.864)
firmsd X 12e X postcrisis	-0.00163	-0.00588	-0.00333	-0.00779*	-0.00599	1.125	1.167	0.699
	(0.00839)	(0.00914)	(0.00974)	(0.00470)	(0.00507)	(0.842)	(0.876)	(0.931)
dlev X pcrisis X netdebt	7.39e-05*			1.05e-05**		4.90e-05		
	(4.04e-05)			(5.03e-06)		(0.000770)		
dvol X pcrisis X netdebt	-0.000193**			-2.31e-05**		-4.26e-05		
	(9.47e-05)			(1.10e-05)		(0.00185)		
dlev X pcrisis X nonfdi			-8.92e-08**		-2.79e-08**			-1.68e-07
			(3.91e-08)		(1.26e-08)			(2.12e-06)
dvol X pcrisis X nonfdi			-1.10e-07*		-6.30e-08**			3.56e-06
			(6.51e-08)		(2.87e-08)			(5.13e-06)
Constant	0.000210***	0.000139***	0.000217***	2.05e-05**	3.19e-05***	0.00481***	0.00386***	0.00596***
	(4.23e-05)	(2.97e-05)	(2.02e-05)	(9.43e-06)	(8.88e-06)	(0.00140)	(0.00125)	(0.00113)
Observations	14,252	13,403	12,877	15,775	13,888	15,775	14,846	13,888
Adjusted R-squared	0.127	0.129	0.130	0.103	0.107	0.128	0.122	0.131

Table XVIII: Effects of country level governance on credit risk

This table reports the effects of country level governance (source: Oxford Economics, Datastream) on panel regressions in Table VIII. We employ a triple interaction of leverage x post-crisis x governance. Governance is the global governance factor obtained as the first principal component of all static and time-series governance variables as defined in the Appendix A. We employ credit risk proxies (in levels and changes) for all the emerging markets using the monthly data for the period 2002-15 and study. Explanatory variables include leverage, volatility and other firm-specific characteristics, and aggregate market variables. The leverage and firm level idiosyncratic volatility variables have dummy interactions for crisis (2007-09) and post-crisis (2010-15) periods. All variables are defined in Appendix A. We do not report control variables for brevity. All regressions include controls for year-specific fixed effects, country-specific cluster effects, and t-statistics adjustments for heteroscedasticity, autocorrelation and cross-correlations. Values of *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5, and 10 percent levels, respectively.

VARIABLES	(1) Level Spread5y	(2) Level pd_12_month	(3) Level dtd	(4) Change Spread5y	(5) Change pd_12_month	(6) Change dtd
Leverage_MVC	0.0225**	0.0115***	-1.523*	0.00519	0.00620**	-0.698
	(0.00929)	(0.00390)	(0.884)	(0.00353)	(0.00269)	(0.517)
leverage X crisis	0.00760	0.00783***	-1.121	0.00135	0.00572***	-0.402
	(0.00936)	(0.00293)	(0.715)	(0.00333)	(0.00166)	(0.361)
leverage X postcrisis	0.00760	0.00942**	-1.682**	-0.00504	0.00682***	-0.662
	(0.00760)	(0.00385)	(0.792)	(0.00388)	(0.00252)	(0.439)
firmsd X 12e	0.115***	0.0339***	-11.59***	0.0140	0.00997***	-3.685***
	(0.0229)	(0.00918)	(2.071)	(0.00892)	(0.00341)	(0.822)
firmsd X 12e X crisis	-0.0317	-0.00690	3.693**	5.47e-05	-0.00261	0.852
	(0.0225)	(0.00652)	(1.814)	(0.00735)	(0.00326)	(0.736)
firmsd X 12e X postcrisis	-0.0400*	0.00145	6.112***	-0.00233	-0.00867*	1.510*
	(0.0222)	(0.0105)	(2.201)	(0.00858)	(0.00498)	(0.827)
dlev X pcrisis X govern	-0.00308	0.000836	-0.0519	-0.00127**	4.11e-06	0.0124
	(0.00317)	(0.00142)	(0.229)	(0.000546)	(0.000149)	(0.0213)
dvol X pcrisis X govern	0.00976	0.00740	-0.325	-3.04e-05	-0.000287	-0.0549
	(0.00704)	(0.00450)	(0.643)	(0.00223)	(0.000433)	(0.0616)
Constant	0.0107***	0.00283*	5.792***	0.000165***	2.56e-05***	0.00528***
	(0.00372)	(0.00159)	(0.326)	(2.38e-05)	(8.15e-06)	(0.000992)
Observations	13,790	15,014	15,014	13,326	14,724	14,724
Adjusted R-squared	0.299	0.141	0.343	0.131	0.103	0.124