Lessons Unlearned? Corporate Debt in Emerging Markets*

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April 2016

For a sample of emerging markets, we examine and contrast various firm-level indicators related to corporate fragility and profitability prior to the East Asian Financial Crisis of 1997–1998 and the aftermath of the Global Financial Crisis of 2008–2009. The East Asian Financial Crisis serves as the benchmark that allows us to answer the following question: How do corporate debt vulnerability and profitability indicators in emerging markets post-GFC compare with these indicators on the eve of the East Asian Crisis? We compare the post-GFC indicators to three benchmarks: (i) a within-country comparison relative to 1992-1997 values for a given indicator; (ii) a crisis-country comparison relative to the 1992-1997 average of the five East Asian Crisis countries, and (iii) a within group comparison relative to the 1992-1997 average for all the emerging markets in our sample. We observe substantial heterogeneity and degrees of vulnerability across emerging market countries and firms. The results suggest that while corporate vulnerability levels are not as severe as the run-up to the East Asian crisis, a broader spectrum of emerging markets display weaker liquidity and solvency indicators in the post-GFC period while and corporate distress indicators have increased in the post-GFC period.

JEL Classification: F34, G01, G15, G32
Key Words: Emerging Markets, Corporate Debt, Vulnerability, Firm-Level Data.

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*We thank Hayley Pallan for excellent research assistance.

1. Introduction

The aftermath of the global financial crisis (GFC) was characterized by rapid credit expansion in emerging market countries. Domestic credit expansion was accompanied by a surge in foreign borrowing and deterioration in net foreign debt positions (BIS, 2014; IMF, 2015). The post-GFC period was also marked by a surge in international bond issuance by emerging market nationals. The non-financial corporate sector in emerging markets accounts for a lion's share of this surge in leverage (BIS, 2016). Total domestic and international debt of emerging market-based non-financial firms increased to 74 percent of GDP in 2014, and outstanding international bonds by non-financial corporations grew from $360 billion to $1.1 trillion between 2007 and 2015 (Tables 1 and 2).

An underlying problem is that the build-up of corporate debt has been accompanied by a slowdown in emerging-market growth and all emerging market currencies lost value vis-à-vis the dollar in 2015. It follows that slower growth in emerging markets will make it more difficult to repay that debt. Further, currency depreciation will make it more difficult to repay the portion of that debt that is denominated in foreign currencies.

In addition, the growth in corporate profits has slowed considerably and the return on invested capital in emerging-market firms has significantly declined since the financial crisis. As evidence, emerging markets usually trade at a lower valuation than their advanced-economy counterparts, and while these relative valuations increased in the aftermath of the global financial crisis, emerging markets are trading at a discount again (Figures 1 and 2). However it is worth pointing out that the discount is not as large now as it was in the late 1990s.

Further, the impact of monetary policy reversals in advanced economies on emerging-market sovereign debt premia in conjunction with low corporate profitability and market valuations have the potential to cause severe liquidity problems for emerging market firms. Nearly $1 trillion flowed out of emerging markets in the first three quarters of 2015 eclipsing the outflows during the Global Financial Crisis.

In this paper we compare corporate debt prior to the East Asian Financial Crisis of 1997–1998 with corporate debt in emerging markets in the aftermath of the Global

Financial Crisis of 2008–2009. The East Asian crisis serves as the benchmark that allows us to answer the following question: How do corporate debt vulnerability indicators in emerging markets today compare with these indicators on the eve of the East Asian Crisis?

Why the East Asian Financial Crisis? Historically, emerging market crises arose from sovereign debt problems, and twin banking and currency crises were common (Reinhart and Rogoff, 2009). However, Pomerleano (1998) and Corsetti et. al. (1999) attribute the underlying microeconomic roots of the East Asian crisis to corporate debt vulnerabilities. The crisis was accompanied by widespread corporate failures due to adverse balance sheet effects via currency and maturity mismatches at the firm level. Corporate debt levels prior to the East Asian crisis therefore serve as a natural benchmark to assess corporate sector vulnerabilities in emerging markets today.

While research on the state of corporate balance sheets in emerging markets shows that leverage and foreign currency exposure of EM-based corporates have increased, a lack of relevant benchmarks prevents existing studies from assessing the magnitude of the risks brought about by these trends (IMF 2015). The objective of our paper is to provide such a benchmark by comparing the current situation with the evolution of corporate balance sheets in the run-up to the East Asian Financial Crisis.

We compile detailed firm-level data between 1992 and 2014 from Worldscope and Osiris for 26 countries classified as emerging markets by the Bank of International Settlements. We exclude financial firms from our analysis. The firm-level data provide different indicators from the balance sheets, and income statements to analyze cash flows, leverage, liquidity, and solvency. In addition, we use Altman's (2005) Emerging Market Z-score as a summary indicator of corporate fragility. Finally, the data allow us to compare investment rates (using change in tangible fixed asset proxy) and profitability ratios (return on equity and on invested capital).

The sample consists of two sub-periods: pre-East Asian Financial Crisis (1992-1997) and post-Global Financial Crisis (2009-2014). We compare the post-GFC indicators to three benchmarks: (i) a within-country comparison relative to 1992-1997 values for a given indicator; (ii) a crisis-country comparison relative to the 1992-1997 average of the five East Asian Crisis countries, and (iii) a within group comparison relative to the 1992-1997 average for all the emerging markets in our sample.

Our main findings are as follows. First, the patterns of corporate financial vulnerability and performance confirm that in order to assess the risk of corporate debt levels in the post-GFC period, the appropriate benchmark is an important consideration for the analysis. The within-country cross-time benchmark, the Asian crisis country benchmark and the full emerging market pre-Asian crisis benchmark yield varying cross-country patterns of results.

Second, while approximately half of the emerging markets in our sample display increased leverage in the post-GFC period, only two countries have leverage ratios that exceed the five Asian crisis countries on the eve of their crisis.

Third, more than half our sample countries have higher short-term liquidity needs measured by current to total liabilities compared to the five Asian crisis countries while a third have higher short-term liquidity needs compared to full sample of emerging markets before the Asian crisis.

Fourth, about 85% of the countries in the sample have weaker solvency positions measured by coverage ratios below the average coverage ratio for the emerging market sample prior to the East Asian crisis. It is striking that in the post-GFC period a much larger number of countries have a weaker solvency position compared to the pre-Asian crisis period. This could be a result of higher liabilities, lower profitability or a combination of the two.

Fifth, the modified Altman emerging-market Z-score that measures corporate distress shows that altogether nine countries are in the grey or vulnerability zone post-GFC compared to three in the pre-Asian crisis period. Also, countries in the safe zone show a fall in their Z-scores compared to their pre-Asian crisis scores and are barely over the grey zone threshold. However, three countries were in the distress zone pre-Asian crisis while there are no countries in the distress zone post-GFC.

Turning to real indicators of firm-activity and performance, the data suggest that the pre-Asian crisis was accompanied by a significant build-up in real investment. We find that approximately half of the countries in our sample show an increase in tangible fixed asset investment that exceeds the average for the full emerging market sample in the pre-Asian crisis period. However, the return on invested capital has fallen significantly in the post-GFC period by almost 50% relative to the pre-Asian crisis sample period. Consistent with an increase in leverage, the return on equity (ROE) shows that more than half the sample of countries has higher ROE values in the post-GFC period compared to the pre-East Asian crisis period.

In sum, our results suggest that the emerging markets in our sample have lower leverage ratios compared to the average for the five Asian crisis countries in the run-up to the East Asian crisis. However, a broader set of emerging markets display weaker liquidity, solvency and corporate distress indications compared to the pre-Asian crisis average. Combined with lowered profitability and the recent growth slowdown in emerging markets, these vulnerabilities may portend significant risks for the stability of the financial systems and economies of these countries.

Shocks to highly leveraged non-financial corporates can be transmitted to the domestic economy through a series of direct and indirect channels. Key channels are an impairment of the domestic banking system through the deterioration of credit quality of corporate borrowers, a sudden withdrawal of funds from the domestic financial system by firms that are unable to rollover their foreign obligations, an increase in sovereign risk, and via a reduction in aggregate demand (Acharya et. al., 2015). Understanding potential vulnerabilities requires knowing more about the state of emerging market corporate balance sheets and the drivers of debt accumulation. Our paper provides a first step in this direction.

The investigation we conduct is not a strict apples-to-apples comparison. The East Asian Crisis began in the periphery of the world economy and never fully penetrated the core, so that continuing growth in the advanced economies could act as a buffer to support a quick, export-oriented recovery in Asia. In contrast, the 2008–2009 Global Financial Crisis originated in the core so that the East Asian countries do not have a similar buffer to counter adverse shocks. The present external environment is therefore very different, with the United States slowly recuperating from the GFC, Europe’s shaky recovery in its aftermath, and uncertainty surrounding the Chinese growth slowdown given its importance through both trade and financial linkages for many emerging market countries.

Hence, corporate debt in emerging markets may not need to reach the corporate debt thresholds in pre-crisis East Asia to precipitate a crisis today. The data suggest that many more countries display an increase in corporate leverage in comparison the post-GFC period.[1]

Fiscal policy is another stabilization tool available to policymakers confronted with such negative shocks as systemic corporate distress. Here, the role of sovereign debt and fiscal space are important considerations for the flexibility that emerging market governments will have to respond to widespread corporate failures. The interaction of sovereign and corporate debt levels may also increase investor uncertainty about emerging markets and have feedback effects on the corporate sector's ability to access external finance, generating a self-fulfilling vicious cycle.

Further, with respect to the present growth slowdown in emerging markets, it is worth remembering that while the adjustment of the exchange rate played an important role in facilitating the recovery following the East Asian crisis, with respect to foreign currency denominated liabilities, exchange rate devaluations had adverse balance sheet effects and exacerbated corporate distress.

It is worth noting that similar to the East Asian crisis, concerns about contagion risk still loom large in the context of emerging market countries. However, the channels of contagion in emerging markets may be quite different in the post-GFC context. Funding needs in emerging markets are now met from two global sources: traditional financial markets, largely anchored in the advanced economies (especially the US), and, increasingly, China. These two most important lenders to emerging markets are in the process of retrenching. The US may be in the process of tightening monetary policy for some time, while China's slowing growth has also been associated with less direct investment and financing abroad. Commodity producers are particularly hard hit by China's growth slowdown also because commodity-related foreign direct investment has scaled down. Within Latin America, for example, countries with limited or non-existent

[1] Note also, that our data ends in 2014 due to availability restrictions.

market access (i.e., Argentina, Venezuela and Ecuador) rely heavily on Chinese financing.[2]

Our paper is related to several strands of literature. First and foremost, the paper is related to the literature on the recent evolution of corporate debt in emerging markets. IMF (2015) documents the main trends and shows that the increase in corporate leverage in the aftermath of the Global Financial Crisis was driven by global factors. This finding is in line with Shin's (2013) view that the response to the crisis led to a sudden increase in global liquidity.[3] Acharya et al. (2015) present several case studies and evaluate vulnerabilities and potential policy responses. More generally, Mendoza and Terrones (2008) and Schularick and Taylor (2012) document the association between rapid credit growth and the building of corporate leverage, economic vulnerability, and financial crises.

The paper is also related to the literature on the origins of the Asian financial crisis. Several papers suggest that the crisis was caused by weak fundamentals and excessive risk-taking by corporates. According to this "crony capitalism" view, the increase in corporate leverage was due to moral hazard brought about by poor banking supervision and implicit guarantees for well-connected borrowers (Corsetti et al., 1998, Claessens and Glaessner, 1997, Krugman, 1998, Harvey and Roper, 1999, Johnson et al., 2000).[4]

Pomerleano (1998) uses firm-level data and finds that the Asian financial crisis was caused by excess leverage and poor financial performance in the corporate sector.[5] While Claessens et al. (2000) find evidence of financial fragility in East Asian corporations, they do not find any increase in fragility in the years before the crisis. As

[2] Market access can also change substantially. For example, after the 2015 election in Argentina, the current authorities are working to re-establishing relations with foreign capital.
[3] Chang, Fernandez and Gulan (2016) develop a stochastic dynamic model of an open economy in which the levels of direct versus intermediated finance are determined endogenously and find recent observed patterns to reflect an optimal response to favorable interest rates.
[4] An alternative view as in Furman and Stiglitz (1998), Radelet and Sachs (1998), and Stiglitz and Bhattacharya (2000) maintains that there was nothing particularly wrong with the pre-crisis fundamentals of most East Asian economies. According to these authors, the fundamental cause of the crisis was a process of financial liberalization that made East Asian countries vulnerable to the rapidly changing sentiments of anxious domestic and foreign investors. According to Furman and Stiglitz (1998), the effect of the crisis was then amplified by the policy advice of the IMF.
[5] Ghosh et al. (2002) also show that in 1995–96 several East Asian countries had debt ratios and share of short-term debt which were significantly higher than debt ratios and short-term debt shares in OECD countries.

the risk factors that existed in the 1997 were already present in the early 1990s, they concluded that fragility in the corporate sector may have been an amplifying factor but not the proximate cause of the crisis.

As we compare corporate balance sheets in the post-global financial crisis period with corporate balance sheets in the run-up to the Asian financial crisis, our work is also related to two recent papers that contrast the Asian and European Financial crises. Truman (2013) suggests that, while the origins of the two crises were broadly similar, solvency issues were more severe in Europe than in Asia. At the same time, European crisis countries received more external official support with less demanding policy conditionality. Chari and Henry (2015) show that at the onset of the Asian Crisis the IMF pushed for fiscal consolidation but then allowed crisis countries to increase their deficits. The exact opposite happened in Europe where a fiscal expansion in 2009 was followed by austerity measures starting in 2011. Chari and Henry show that this different policy approach had an adverse impact on the post-crisis economic performance of the affected countries.

The paper proceeds as follows. Section 2 presents trends in broad macro-indicators to motivate the analysis. Section 3 describes the firm-level data. Section 4 describes the methodology and presents results. Section 5 concludes.

2. Emerging Market Borrowing in the Aftermath of the Global Financial Crisis

Over 2001-2007 average credit to the non-financial sector in emerging market countries remained close to 120 percent of GDP. The global financial crisis caused a sudden reduction in credit, which went from 122 percent of GDP in 2007 to 109 percent in 2008. However, credit started expanding rapidly in 2009 and reached 175 percent of GDP in 2015, a 67 percentage point increase with respect to the 2008 trough (Figure 3). Borrowing by non-financial corporations was a key driver of this surge in leverage (corporate debt went from 57 to 101 percent of GDP over 2008-15).[6] Emerging markets stand in contrast with advanced economies characterized by a net increase in government

[6] Over the same period, household debt increased by 12 percentage points and government debt increased by 9 percentage points.

borrowing and a deleveraging process in the household and corporate sectors during the same period (Figure 4).

Low global interest rates notwithstanding, the higher leverage led to a rapid increase in the debt service ratios of EM borrowers.[7] In a period when the average debt service ratio of Advanced Economies decreased from 21 to 18 percent, the average debt service ratio of EMs increased from 10 to 12.5 percent. In a subset of emerging economies characterized by rapid credit expansion, debt service ratios surpassed the advanced economies average (Figure 5).

The rapid credit expansion documented in Figure 3 is partly driven by China's massive post-crisis credit boom. According to BIS data, in China total credit to the non-financial sectors went from 150 percent of GDP in 2008 to nearly 250 percent of GDP in 2015 (Figure 6), with borrowing by non-financial corporations increasing from 100 to 166 percent of GDP and household credit increasing from 18 to 39 percent of GDP. If we exclude China from our sample of emerging market countries we find a more moderate credit expansion (solid line in Figure 3).

There is, in fact, substantial heterogeneity across emerging market countries (Figures 7 to 10). In the post-crisis period (December 2008-September 2015) domestic credit grew by more than 6 percent per year in China but increased by less than 3 percent per year in Argentina, Hungary, Indonesia, India, Korea, Poland, and South Africa. Annual credit growth was between three and four percent in Brazil, Czech Republic, Mexico, Thailand, and Turkey. By the end of 2015 total domestic credit to the non-financial sector was above 200 percent of GDP in China and South Korea and below 100 percent of GDP in Argentina, Indonesia, Mexico, and Russia. Borrowing by non-financial corporations is important in China, Korea, Hungary, Czech Republic, and Turkey. Borrowing by households is instead relatively important in Malaysia and Thailand, and public sector borrowing important in Brazil, India, Indonesia, South Africa, Mexico, and Argentina (Figure 8).

[7] The debt service ratio is defined as the share of income used to service debt.

Non-financial corporations also played a key role in issuances of international bonds.[8] Over 2008-2015, outstanding international bonds by non-financial corporations grew from $360 billion (approximately 30% of total outstanding bonds) to $1.1 trillion (more than 40% of total outstanding bonds). Issuances by non-financial corporations were particularly important in Asia and Latin America, where they now represent nearly 50 percent of total outstanding bonds (Table 2). In China, bonds by non-financial corporations represent more than 50 percent of total outstanding international bonds, and bonds issued by Chinese non-financial corporation are nearly one-quarter of total outstanding bonds issued by non-financial corporations based in EMs (Table 3).

In 2007, total claims of BIS reporting banks on EMs and outstanding international securities issued by EM nationals added up to $3.2 trillion (Table 4), by 2015 claims by BIS reporting banks and international securities surpassed $5.8 trillion, this 80 percent increase in the liabilities of EM countries was due to a $1 trillion increase in claims by BIS reporting banks (a 46 percent increase) and a $1.7 increase in outstanding securities (a 141 percent increase). The largest increases, both in percentage and absolute terms, were in Emerging Asia and Latin America (148 percent and 93 percent, respectively). The African continent was instead characterized by a rapid expansion in bond issuances (outstanding bonds increased by 139 percent), albeit from a low base.

The figures for Asia and, to some extent, Latin America are however driven by two important outliers. Liabilities by Chinese nationals increased by 500 percent and, if we remove China from the Asian total, we find a more modest increase in foreign liabilities (a 58 percent increase instead of 148 percent). In the case of Latin America, instead, removing Brazil from the total brings down the increase in foreign liabilities from 93 to 76 percent. Brazil and China account for 48 percent of the increase in total claims of BIS reporting banks on EMs and outstanding international securities issued by EM nationals, and excluding Brazil and China from the EM total reduces the percentage increase of these liabilities from 80 to 45 percent.

The increase in leverage was mostly driven by global factors and was particularly important in non-tradable cyclical sectors such as construction. Higher leverage also

[8] In 2015, borrowing by non-financial corporation accounted for about 25 percent of EM cross-border borrowing from BIS reporting banks.

came with more foreign currency borrowing: in 2007 foreign currency bonds represented 16 percent of international debt by emerging market-based non-financial corporations and by 2014 the foreign currency share had grown to 22 percent (IMF, 2015).[9] Despite higher leverage and foreign currency exposure, emerging market-based corporates have been able to borrow at longer maturities and lower yields.[10]

An additional indicator of potential vulnerability relates to currency mismatches. As mentioned in the introduction, domestic credit expansion in emerging markets was accompanied by a surge in foreign borrowing and deterioration in net foreign debt positions.[11],[12] The increase in leverage and foreign currency debt documented above took place in an environment of ample global liquidity and record low policy rates in advanced economies. It is now feared that normalization of monetary policy conditions in the US could lead to a wave of corporate failures and possibly to financial crises in a number of emerging economies. According to this view the "taper tantrum" of May 2013 was the trailer for the sequel of the Asian Financial Crisis, which wreaked havoc on countries with strong fiscal situations and weak corporate balance sheets.

Moreover, the recent increase of foreign currency borrowing may have additional negative consequences given that much foreign-currency corporate borrowing seems to be linked to speculative carry-trade activities rather than being driven by the need to fund real investment projects (Bruno and Shin, 2015 and Caballero et al., 2015). Bruno and Shin (2015) conclude that the borrowing decisions of non-financial corporates are sometimes motivated by "financial risk-taking rather than real risk-taking opportunities." Caballero et al. (2015) corroborate this finding by showing that foreign currency borrowing by non-financial corporates is partly driven by regulatory arbitrage. If non-financial corporates behave like banks and deposit the proceeds of foreign bond issuances

[9] The share of dollar-denominated bonds issued by non-financial corporations is higher than the overall share of dollar-denominated bonds (Table 2).
[10] Maturity went from the pre-crisis average of 5 years to more than six years and average yields decreased from 8 to 6 percent (IMF, 2015).
[11] With a new measure of aggregate currency mismatches, Chui et al. (2016) show that emerging market corporates will have to deal with increased currency mismatches at a time of declined profitability.
[12] Total cross-border claims on EMs by BIS reporting banks increased from $2.4 trillion in 2008 to a peak of $3.7 trillion on 2014. Preliminary data for 2015 indicates a $200 billion retreat, with total cross-border claims standing just below $3.5 trillion (Table 1).

in the domestic banking system (Powell, 2014) a shock to international funding may be quickly transmitted to the domestic financial system.

3. Data and Summary Statistics

Firm-level data are from Worldscope (gathered through Datastream) and Osiris.[13] Both sources provide detailed historical information for listed firms and the main unlisted firms for a wide sample of countries. We compared Worldscope and Orisis' coverage for emerging markets and chose the data source with the most data availability for each country. Osiris had better coverage for China and India, while Worldscope dominated for all other countries.

The sample consists of data on non-financial firms from 1992–2014 for the main countries classified as emerging markets by the Bank of International Settlements (Argentina, Brazil, Chile, China, Colombia, Eastern Europe, India, Indonesia, Jordan, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, South Africa, South Korea, Taiwan, Thailand, Turkey, and Vietnam). Coverage of Eastern European countries is extremely sparse. We therefore group together firms from Czech Republic, Hungary, Poland, Russia, Slovakia, and Slovenia as 'Eastern Europe' in our tables.

We divide the data into two periods: pre-Asian Financial Crisis (1992-1997) and post-Global Financial Crisis (2009-2014).[14] We use different indicators to analyze corporate fragility and profitability using data from the balance sheet, income statements, and cash flows.

For *leverage*, we use as main indicator the debt to equity ratio (a firm's total debt divided by its common equity), which indicates how much debt a company is using to finance its assets relative to common equity. As a proxy for *liquidity*, we use the current ratio (current to total liabilities). In order to analyze *solvency*, we compute the coverage ratio, the ratio of earnings before interest, taxes, and depreciation (EBITDA) over total

[13] The Worldscope database provides detailed historical financial statement information for the world's leading public and private companies. Osiris, published by Bureau van Dijk, has information as well on listed, and major unlisted/delisted, companies around the world. All data for Tangible fixed assets is also from Orisis. When extracting data from Orisis, we restricted the sample to include sales information.

[14] We also compared results against an average of the period 1992-1997. The main results and implications are similar.

liabilities to measure a company's ability to use their cash flow to pay back its outstanding liabilities.

As a summary measure of *corporate fragility*, we calculate the Altman (2005) Emerging Market Z-score. The measure weighs four ratios constructed using the firms' financial statements (working capital/total assets, retained earnings/total assets, operating income/total assets, book value of equity/total liabilities).[15] The measure is an enhanced version of the standard Z-score model adjusted to incorporate the characteristics of emerging market firms and best suited to assess the relative vulnerability of the sample of countries we consider in this paper. In terms of the measure, lower scores are associated with greater vulnerability and likelihood of bankruptcy. Companies with EM Z-scores greater than 6.25 are considered to be in the "safe zone", scores between 5.85 and 3.75 indicate vulnerability, and scores below 3.75 indicate that the firm is in state of distress. The following table from Altman (2005) compares Z-scores with bond ratings.

Table A. Altman Z''-Score and Bond Rating

	Z' Score			Rating	Z' Score			Rating	
Safe Zone		>	8.15	AAA	5.65	-	5.85	BBB-	Grey Zone
	7.60	-	8.15	AA+	5.25	-	5.65	BB+	
	7.30	-	7.60	AA	4.95	-	5.25	BB	
	7.00	-	7.30	AA_	4.75	-	4.95	BB-	
	6.85	-	7.00	A+	4.50	-	4.75	B+	
	6.65	-	6.85	A	4.15	-	4.50	B	
	6.40	-	6.65	A-	3.75	-	4.15	B-	
	6.25	-	6.40	BBB+					Distress Zone
	5.85	-	6.25	BBB	3.20	-	3.75	CCC+	
					2.50	-	3.20	CCC	
					1.75	-	2.50	CCC-	
						<	1.75	D	

[15] EM score =6.56 (X_1) + 3.26 (X_2) + 6.72(X_3) + 1.05(X_4) + 3.25, where X_1= working capital/ total assets,X_2=retained earnings /total assets, X_3=operating income /total assets, X_4=book value of equity /total liabilities. The constant term (derived from the median Z`` score for bankrupt US entities) standardizes the analysis so "that a default equivalent (D) is consistent with a score below zero." The use of book value of equity, not market value, was motivated by a concern that equity markets may be less liquid than in developed markets. Altman (2005) adjusts the measure to consider currency devaluation vulnerability, industry adjustments (relative to U.S.): competitiveness position adjustment (dominant firms in the industry due to size, political influence, etc.); special debt issue figure (collateral or bona fide, high-quality guarantor); sovereign spread (comparison to US corporate bond of the same rating).

We analyze the increase in tangible fixed assets as a proxy for *investment*. *Profitability* is captured by the return on equity (ROE) and return on invested capital (ROIC). ROE is defined as the amount of net income returned as a percentage of shareholders' equity, and return on invested capital is the ratio of operating profit (earnings before interest and tax) to invested capital (sum of shareholders' equity and debt liabilities).

The number of companies with data for every variable and year of interest is too small to extract an accurate picture of the country's corporate health. Due to this limited data availability, our sample changes for every indicator and time-period (e.g. to analyze yearly debt/assets ratio for the 2009-2014 period, we select for our sample all companies that have data for Total Debt, Total Assets, and Sales for each year in 2009-2014). We exclude outliers and all noticeable errors in the data.

Appendix Table A presents the coverage of the data per country and period of analysis. For the pre-East Asian crisis period, the sample varies from a maximum of 646 firms (with liabilities data) and a minimum of 263 firms (Altman Emerging Market score). Coverage per country is highest for India, Malaysia, Thailand, Malaysia, and South Korea (104, 92, 80, and 70 firms, respectively, with debt to asset data) and lowest for Eastern European countries (aggregated for the region given the small number of firms).

For the period 2009-2014, the sample consists of a maximum of 11,163 firms (tangible assets) and a minimum of 5,256 firms (Altman's Emerging Market score). In this period, coverage was highest for China, India, Thailand, Taiwan and South Korea (2,559, 2,326, 1,338, and 1,029 firms, respectively for tangible assets) and lowest for Colombia and Morocco (20 and 49 firms respectively). The coverage of Eastern European countries improved substantially to more than 450 firms. As mentioned earlier, we display the data aggregated for the whole region.

Overall, the dataset covers primarily large firms, mainly because they have to be listed on a stock exchange to be included in the database and publicly traded companies tend to be large. While a lack of smaller firm coverage tends to pose problems in other settings, a focus on large corporations is to our advantage in this paper. Large firms have the propensity to contribute more to systemic risk, and thus they are precisely the firms whose financial health is of greatest concern to policy-makers.

4. Results

For different indicators of corporate financial vulnerabilities and firm performance, Tables 5 to 11 present weighted mean values using sales (as a proxy for size) as the weights. The weighted means are calculated for all firms in a country by year. The yearly weighted means are then averaged for each of the two sub-periods, also by country. We also analyze simple means and simple and weighted medians. The average of the five East Asian crisis countries includes Indonesia, Malaysia, Philippines, South Korea and Thailand.

4.1 Leverage

Table 5 presents the findings for changes in leverage measured as the debt to equity ratio for the firms in the sample. The firm-level data are aggregated by country to compare the pattern of leverage before the East Asian crisis and after the Global Financial Crisis. Table 5 presents the summary statistics for mean leverage weighted by firm size.

The debt to equity is a leverage ratio that compares a company's total liabilities to its total shareholder’s equity. The measure provides information about the magnitude of the commitments from lenders and creditors to a firm compared to the magnitude of shareholder commitments. The debt to equity ratio therefore provides an alternative lens from which to view a firm's leverage position by comparing total liabilities to shareholders' equity rather than to assets. Similar to the debt to assets ratio, a lower percentage means that a company is using less leverage and has a stronger equity position. It is important to note that the debt to equity ratio provides a more striking perspective on a firm's leverage position than the debt to assets ratio percentage. For example, South Korea’s pre-Asian crisis average debt to asset ratio of 68% for the firms in our sample seems less burdensome than its debt-equity ratio of 231.6%, which implies that debt obligations are more than twice as high as shareholder commitments.

We also examined the patterns for the simple means and medians, as well as the weighted median. Here a point about the relevance of the summary statistic used is worth noting. In general, the weighted median measure attenuates the distributional consequences of observations in the tails of a distribution. In many circumstances this adjustment is warranted to ensure that outliers do not drive the results. In other words, if a few observations skew the weighted mean, the weighted median that adjusts for non-uniform statistical weights and gives the 50% weighted percentile measure is the more appropriate statistic. In the case of leverage and measuring the overall riskiness of corporate debt for the financial system in a country, however, we would like to assess the upper bound of the risk. If a few large firms are also the ones with the highest leverage, it is desirable to give a larger weight to these observations since arguably these firms have the greatest potential to generate systemic risk. We therefore present the main results using the (sales) weighted mean rather than the weighted median while recognizing that the weighted median provides a useful alternative benchmark.

Columns 1 and 2 present the firm-level weighted mean leverage by country for the pre-Asian crisis (1992-97) and post GFC (2009-14) periods. Columns 3 and 4 examine whether the post-GFC average is higher than the pre-East Asian crisis period for each country. Column 5 tests whether the average post-GFC period leverage for a country is higher than the average leverage in the five East Asian crisis countries. The last column tests whether the average post-GFC period leverage for a country is higher than the average leverage in the full sample of emerging markets on the eve of the Asian crisis.

Column 1 shows that the average debt to equity ratio in the East Asian crisis countries was 114.4% while the average for the full emerging market sample was 75.8%. It is clear that the benchmark to assess how post-GFC corporate debt levels compare with leverage ratios before the Asian crisis differs significantly depending on whether we focus on the countries most adversely affected by the crisis or the group average for emerging markets viewed collectively. Column 4 shows that out of the 19 countries for which we have data for both sub-periods, 10 countries have higher average leverage ratios in the post-GFC period. Column 5 suggests that only 2 countries have higher leverage ratios compared to the average leverage in the five crisis countries on the eve of their crisis. Column 6 shows that 12 countries have higher leverage compared to the pre-

Asian crisis average for emerging markets as a group. Figure 11 confirms these patterns visually to demonstrate the two thresholds of pre-Asian crisis average leverage ratios—the crisis five and the full emerging market sample.

For purposes of illustration it is interesting to note the patterns we obtain when we use the (sales) weighted median instead of the weighted mean. First, the weighted median leverage ratios for the Asian crisis five and full emerging market sample are much lower than the weighted mean, 92.89% and 67.05%, respectively. Second, 14 out of 19 countries have a higher post-GFC weighted median. Third, three countries have a higher weighted median compared to the five Asian crisis countries while seven countries have a higher weighted median leverage compared the pre-Asian crisis emerging market weighted median.

These simple statistics confirm that in order to assess the risk of corporate debt levels in the post-GFC period, the appropriate benchmark is an important consideration for the analysis and for which there exists no consensus.

4.2 Liquidity

Table 6 provides the (sales) weighted mean of the current to total liabilities ratio by country to analyze the liquidity needs of the firms in our sample. Current liabilities measure a firm's debts and other obligations that are due within one year and include short-term debt, accounts payable, accrued liabilities and other debts. Note that current liabilities provide a more comprehensive measure of a firm’s short-term liquidity needs compared to short-term debt since it includes accounts payable and accrued liabilities.

Column 6 suggests that seven countries for which we have current liability data for both periods demonstrate a higher current to total liability ratio in the post-GFC sub-period. Interestingly this ratio (~ 60%) was not significantly different across the crisis five versus total emerging market sample in the pre-Asian crisis sub-period. Column 5 shows that 10 out of the 21 countries have higher short-term liquidity needs compared to the five crisis countries while seven countries have higher short-term liquidity needs compared to full sample of emerging markets before the Asian crisis (Column 6).

Once again, illustrating that the pattern of results depends on the summary statistic chosen, the weighted median results are slightly different. The pre-crisis average value of the weighted median for the full emerging market sample in the pre-crisis period is higher (65%) compared to the average value for the five crisis countries (60%). Hence, only five countries display a higher weighted median in the post-GFC period compared to the historical pre-Asian crisis period. 10 countries show a higher post-GFC weighted median compared to the crisis five while only seven countries show a higher post-GFC weighted median compared to the full emerging market pre-Asian crisis sample value.

4.3 Solvency

The coverage ratio is a measure of a firm's ability to meet its obligations to lenders. Generally, the higher the coverage ratio, the better the ability of the firm to fulfill its debt obligations. Common coverage ratios include the interest coverage ratio, debt service coverage ratio and the asset coverage ratio. The interest payment and debt service ratio data are very sparse in our sample of emerging market firms. We therefore use a modified version of the coverage ratio that is the ratio of EBITDA to total liabilities. By definition, this modified ratio will be biased downward as total liabilities exceed interest expenses or other debt obligations used to calculate more standard versions of the coverage ratio. Nevertheless it provides a useful snapshot of a firm's solvency position.

In Table 7, we see that the pre-crisis coverage ratio average of the East Asian countries has remained unchanged. The average for the full emerging markets sample on the other hand has fallen in the post-GFC period. Column 3 shows that 14 out of 19 countries have coverage ratios that are lower than their pre-Asian crisis levels. Eleven countries have coverage ratios that exceed that of the five East Asian crisis countries. However 18 countries have post-GFC coverage ratios that are below the average coverage ratio for the emerging market sample prior to the East Asian crisis. It is striking that in the post-GFC period a much larger number of countries have a weaker liquidity position compared to the pre-Asian crisis period. This could be a result of higher liabilities, lower profitability or a combination of the two. Regardless, the weakening coverage ratio suggests an increase in corporate financial vulnerability across a broader set of emerging markets when compared to the pre-East Asian crisis period.

4.4 Corporate Fragility

As mentioned in section 3, a modified version of Altman's Z score can be used as a composite summary statistic for corporate fragility. The measure includes various income statement and balance sheet items such as the ratio of working capital, retained earnings and operating income to assets as well as the book value of assets to total liabilities to combine various aspects of firm operations to give an overall picture of corporate health or ill-health as the case may be. The advantage of the approach as the data section shows is that the different ranges of "safe", "grey" and "distress" can be correlated with corporate ratings letter grades used by ratings agencies. Altman modifies the summary statistic to account for different structural characteristics of emerging market firms such as replacing the market value of assets to the book value to adjust for the relative illiquidity of trading in emerging markets in comparison to firms in advanced economies. The Z-score statistics correspond to AAA to BBB for the safe zone, BBB- to B- for the grey zone and CCC+ and below for the distress zone.

Table 8 presents the results. The table shows that among the Asian crisis countries both South Korea and Thailand were in the distress zone prior to the East Asian Crisis. Turning to other countries in Asia, India was also in the distress zone although not eventually a crisis country. Asian countries in the safe zone were China, Indonesia, Malaysia, the Philippines and Taiwan. In Latin America while Argentina and Brazil were in the grey zone, Chile, Colombia, Mexico and Peru were in the safe zone. Note also that both Turkey and South Africa were in the safe zone. The average Z-score for the five crisis countries was 5.2 or the grey zone, the pre-Asian crisis emerging market average was 6.2 or in the safe zone.

The picture changes in the post-GFC period. Countries with higher Z-scores in the post-GFC period are Colombia, Eastern Europe Malaysia and Indonesia that were also in the safe zone in the pre-Asian crisis period. Both South Korea and Thailand move from the distress zone into the safe zone. China, India and Turkey are in the grey zone as are the big countries in Latin America such as Argentina, Brazil and Mexico. Altogether nine countries are in the grey zone post-GFC compared to three in the pre-Asian crisis period. The picture suggests that the issues of corporate vulnerability apply to a broader set of emerging markets in the post-GFC period given the number of countries in the grey zone.

It is worth pointing out that three countries were in the distress zone pre-Asian crisis while there are no countries in the distress zone post-GFC. Also, note that of the countries in the safe zone show a fall in their Z-scores compared to their pre-Asian crisis scores and are now barely over the grey zone threshold. 14 out of 21 countries or two-thirds of the sample countries have Z-scores that correspond to letter-grade ratings of BBB and below. If the Altman scores provide a leading indicator of the potential for distress, the data suggest that corporate financial vulnerabilities are more widespread now than in run-up to the East Asian crisis.

4.5 Real Investment

A key feature of the countries hardest hit by the Asian financial crisis was a rapid build-up in fixed capital investments in the years prior to the crisis. As capital flowed into these economies and foreign capital market access continued to improve, increased in pre-crisis leverage was accompanied by a boom in real investment. For example, the weighted mean of the change in tangible fixed assets in the five Asian crisis countries was 25% in comparison to the emerging market average of 16% between 1992 and 1996. In the aftermath of the crisis, GDP collapsed as did investment ratios. While growth recovered in the years following the crisis, neither growth rates nor investment ratios have recovered to their pre-crisis levels.

To examine whether a similar increase in real investment took place in the aftermath of the Global Financial crisis, Table 9 examines the change in tangible fixed assets between 2009 and 2014 (Column 2). The data suggest that the weighted mean change in tangible fixed assets decreased to 11% for the full emerging market sample. Column 4 shows that out of the countries for which we have data for both sub-periods, five have an increase in their real investment rates following the global financial crisis relative to the pre-Asian crisis period . However, five out of the 21 exceed the pre-Asian crisis average for the full emerging market sample.

A caveat about coverage is in order since information on tangible assets is sparse compared to the financial variables examined thus far. For instance, it is interesting to note that while China shows a higher post-GFC investment rate with a 23% weighted mean change in tangible fixed assets, the rate exceeds the pre-Asian crisis country average. On the surface, the finding appears contrary to the macro data for China, which suggests post-GFC investment ratios (gross capital formation) of on average 47% of GDP. However, this could in large part be because the huge increase in investment in China in the post GFC was implemented by local governments and not by firms.

4.6 Profitability

Next we examine the profitability of the firms in our sample. We use two measures: the return on invested capital (ROIC) and the return on equity (ROE). A concern with increased leverage is that if it is accompanied by a slowdown in profitability, firms will find it more difficult to service their debt obligations. Unlike equity, debt is a non-contingent claim that needs to be met regardless of the state of firm profits. Firm-level liquidity and solvency ratios therefore feature some measure of earnings relative to debt service obligations to provide a measure of a firm's flexibility with respect to these obligations.

Table 11 shows that while the ROIC for the five crisis countries prior to the East Asian crisis was 9.8%, the number for the overall emerging markets sample was approximately 25% higher at 13.2%. In the post-GFC period in contrast, the average ROIC across all emerging markets in our sample has fallen by about 20% to 10.9% relative to the pre-Asian crisis sample period. Consistent with a picture of a broader sample of emerging markets displaying greater corporate vulnerability we see that only seven countries show higher profits compared to the pre-Asian crisis period. Moreover, while Indonesia, Thailand and South Africa show a significant rise in profitability, the other countries with higher profits in the post-GFC period (Argentina, Brazil and South Korea) are only marginally higher than their pre-Asian crisis levels. While eight countries have lower profits compared to the East Asian pre-crisis five average, fifteen countries have a ROIC lower than the pre-Asian crisis emerging market average. To illustrate the breadth of the fall in corporate profits in the post-GFC period is to notice that included in this group are Brazil, Chile, China, Colombia, Eastern Europe, India, Jordan, Malaysia, Mexico, Morocco, Philippines, South Korea, Taiwan, Thailand and Turkey.

Interestingly, consistent with an increase in leverage, the return on equity (ROE) shows a much different pattern, see Table 11. Note that increased leverage (debt) increases the expected rate of return on the equity simply because leveraged investments are riskier than unlevered ones. The average ROE increased from 10.4% to 14% for the East Asian crisis countries across the two sample periods while the overall emerging market average increases from 14.7% to 15.2%. More than half the sample of countries has higher ROE values in the post-GFC period compared to the pre-East Asian crisis period. Strikingly, 19 countries have higher ROE values compared to the five East Asian crisis countries while 11 have higher ROE rates compared to the emerging market average ROE before the Asian crisis.

5. Conclusion

In this paper, for a sample of emerging markets, we contrast a range of firm-level indicators related to corporate fragility and profitability prior to the East Asian Financial Crisis of 1997–1998 and the aftermath of the Global Financial Crisis of 2008–2009. We compare the indicators to three benchmarks:(i) a within-country cross-time comparison to the 1992-1997 values for a given indicator, (ii) a comparison relative to the 1992-1997 average of the five East Asian crisis countries, and (iii) a within group comparison relative to the 1992-1997 average for all the emerging markets in our sample.

We start by corroborating previous results (e.g., Pomerleano, 1998 and Claessens et al., 2000) showing that in the 1992-1997 period East Asia corporates had greater leverage and financial vulnerabilities than corporates in other emerging markets. While there is substantial cross-country heterogeneity in the post-Global Financial Crisis period, our data suggest that corporate leverage and vulnerabilities are now higher than the vulnerabilities displayed by emerging-market averages prior to the Asian Financial crisis.

However, while these vulnerability levels are not necessarily at higher than in the East Asian countries that were eventually hit by the crisis, a broader range of countries are in the “grey zone” or at risk. A word of caution in interpreting our results is warranted. Internal and external conditions have changed between the two sample periods. But overall, when comparing the data, it is clear that the benchmark matters.

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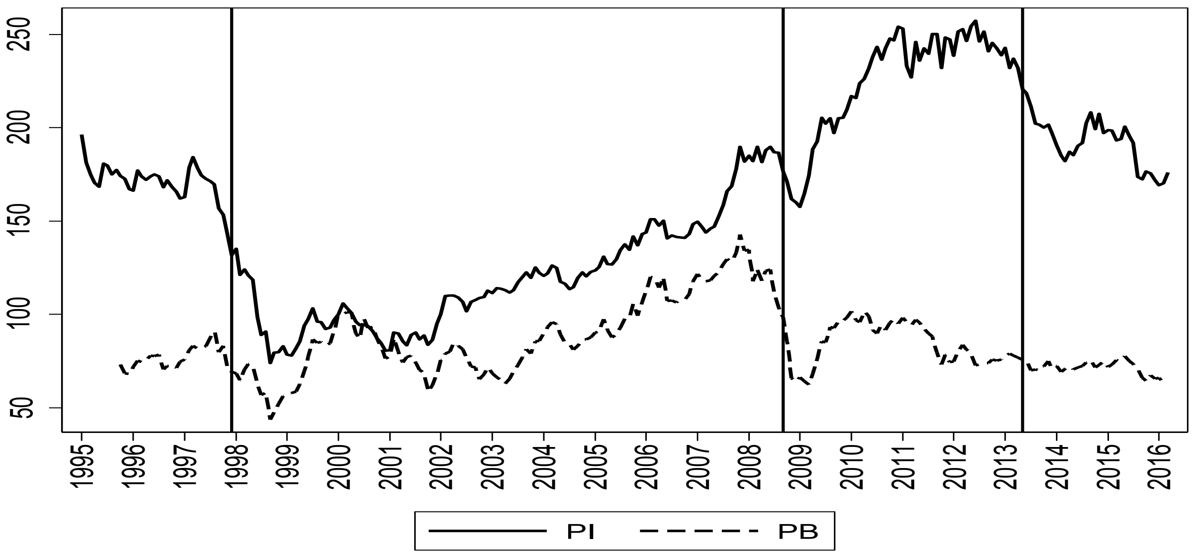
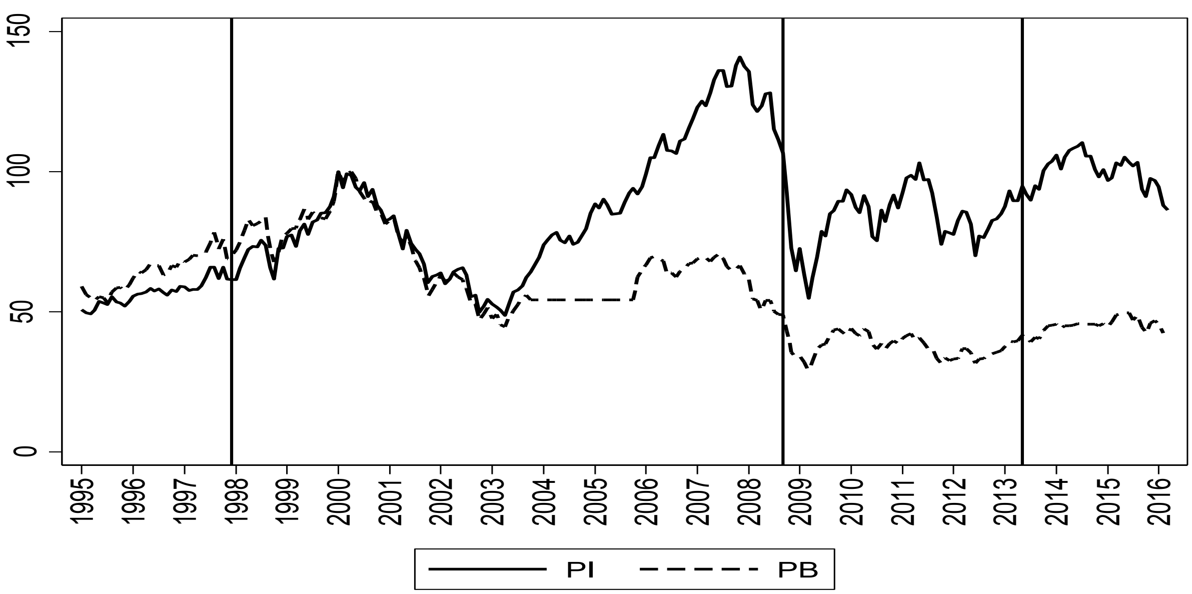
Figure 1. Price Index (solid line) and Price to Book Ratio (dashed line) for MSCI EM index



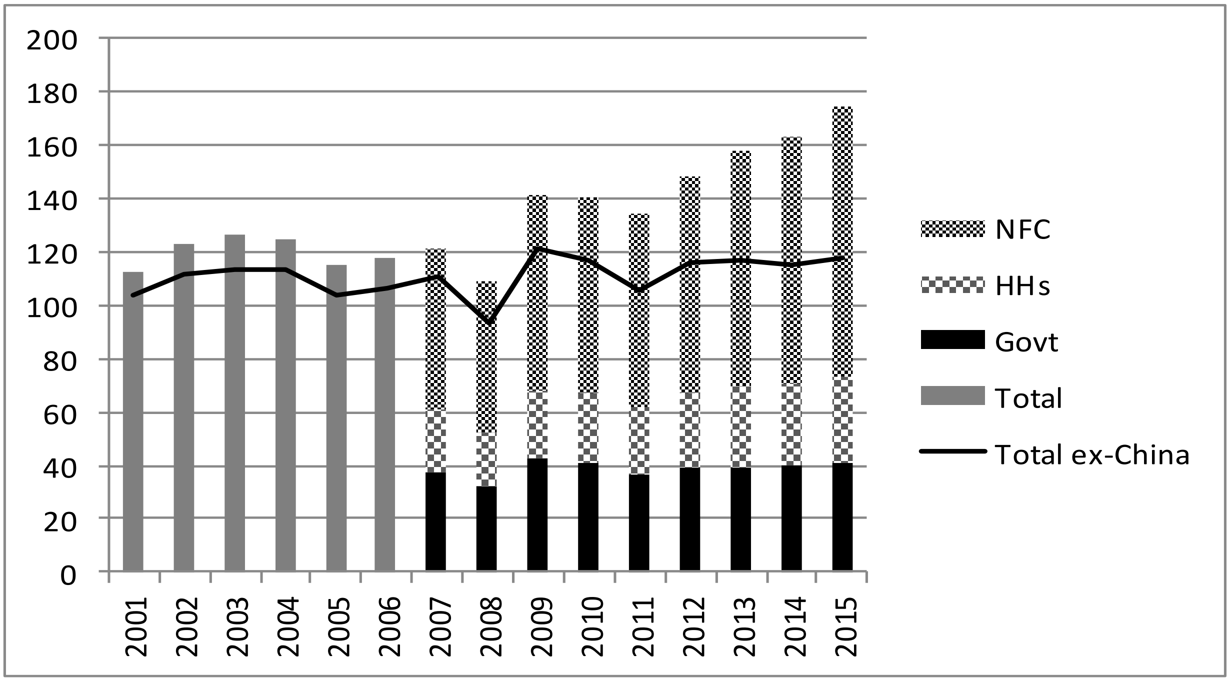
The three reference lines are July 1997 (Asian Crisis), September 2008 (Lehman), and may 2013 (taper tantrum). The price index is rescaled as percentage of MSCI Advanced economy index and is set=100 on January 1st 2000. Source: Datastream.

Figure 2. Price Index (solid line) and Price to Book Ratio (dashed line) for MSCI AE index



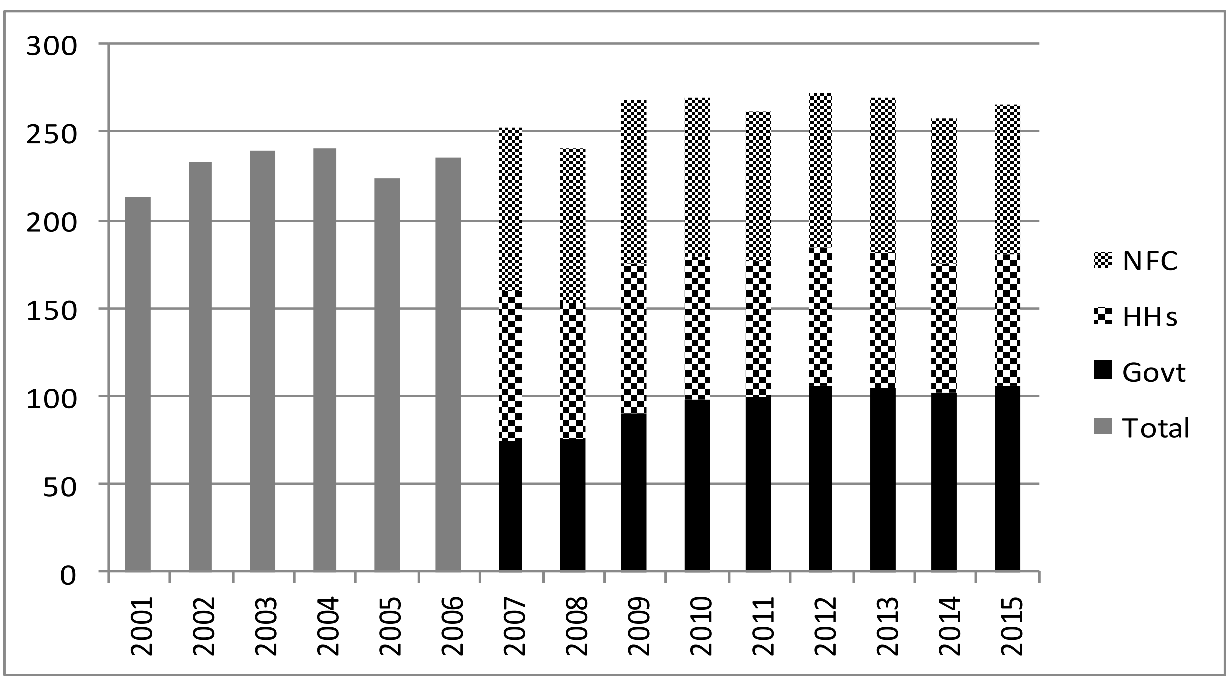
The three reference lines are July 1997 (Asian Crisis), September 2008 (Lehman), and May 2013 (taper tantrum). The two indexes are set =100 on January 2000. Source: Datastream.

Figure 3: Total Credit to the Non-financial Sector in Emerging Markets



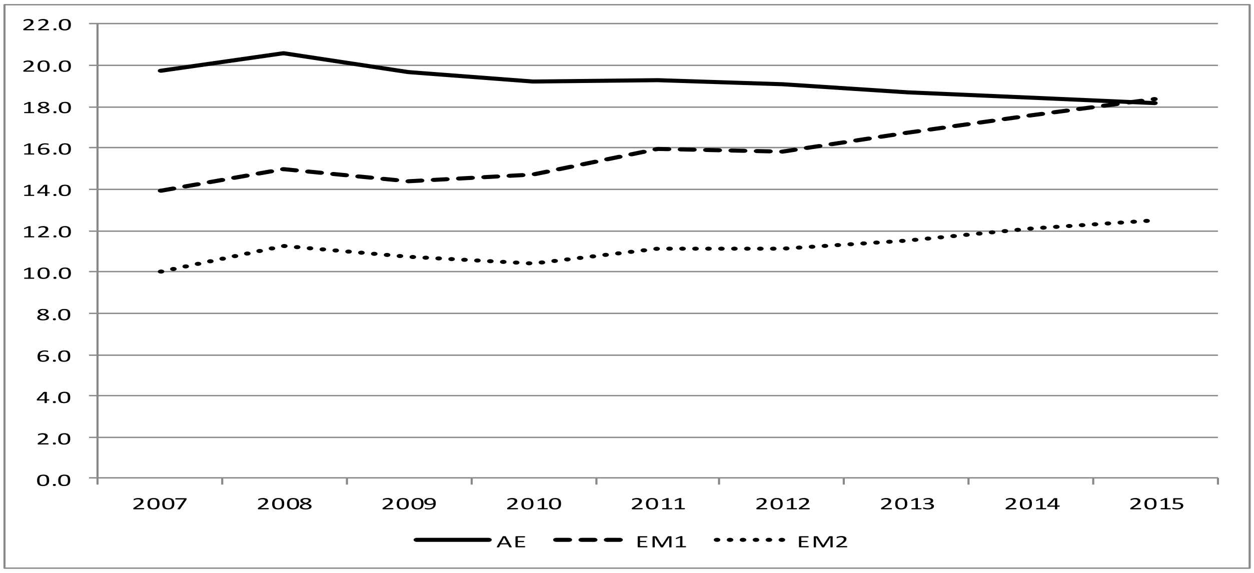
Source: own elaborations based on BIS total credit statistics. (Decomposition across sectors is only available after 2006)

Figure 4: Total Credit to the Non-financial Sector in Advanced Economies



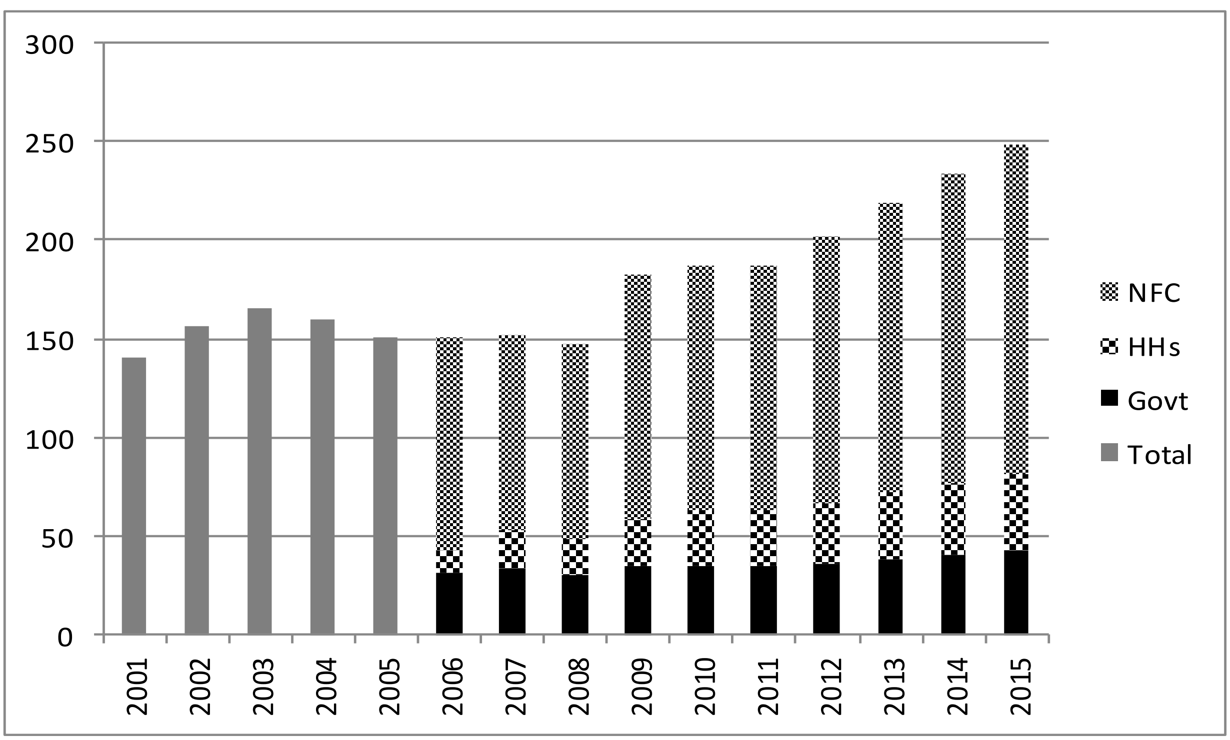
Source: own elaborations based on BIS total credit statistics. (Decomposition across sectors is only available after 2006).

Figure 5: Debt Service Ratio in the Non-financial Private Sector (Simple Averages)



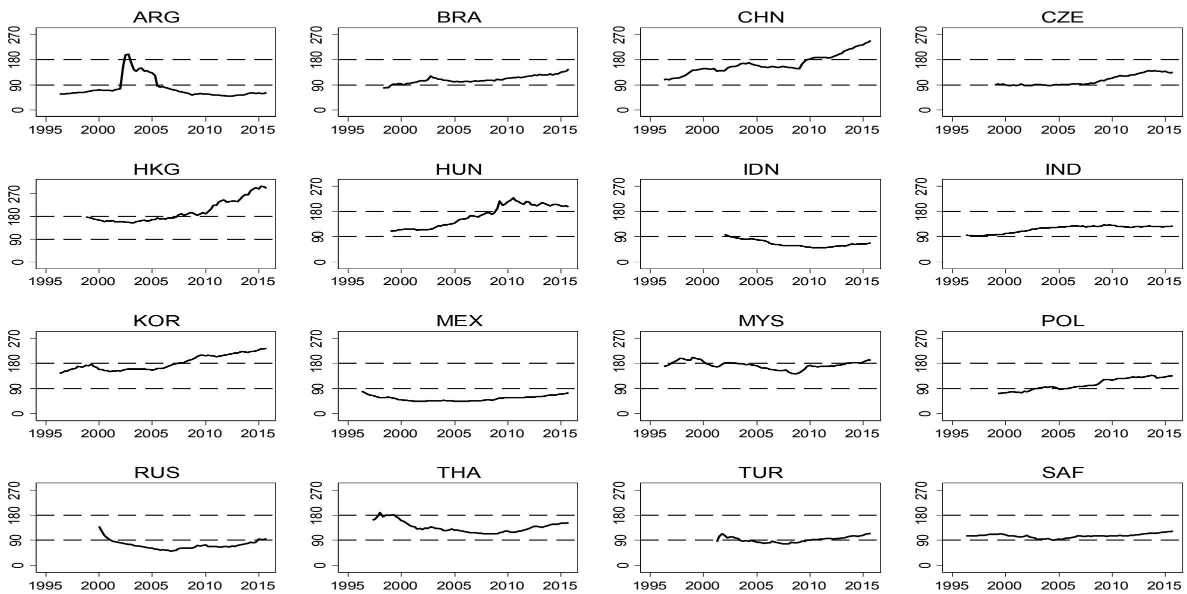
Source: Own elaborations based on BIS debt service ratios statistics. The advanced economies (AE) include: Australia, Belgium, Canada, Switzerland, Germany, Denmark, Spain, Finland, France, Italy, Japan, Netherlands, Norway, Portugal, Sweden, UK and US. The full sample of Emerging Markets (EM2) includes: Brazil, China, Czech Republic, Hong Kong, Hungary, India, Korea, Mexico, Malaysia, Poland, Russia, Thailand, Turkey, and South Africa. The restricted sample of Emerging Markets (EM1) includes: Brazil, China, Hong Kong, Korea, Malaysia, and Thailand.

Figure 6: Total Credit to the Non-financial Sector in China



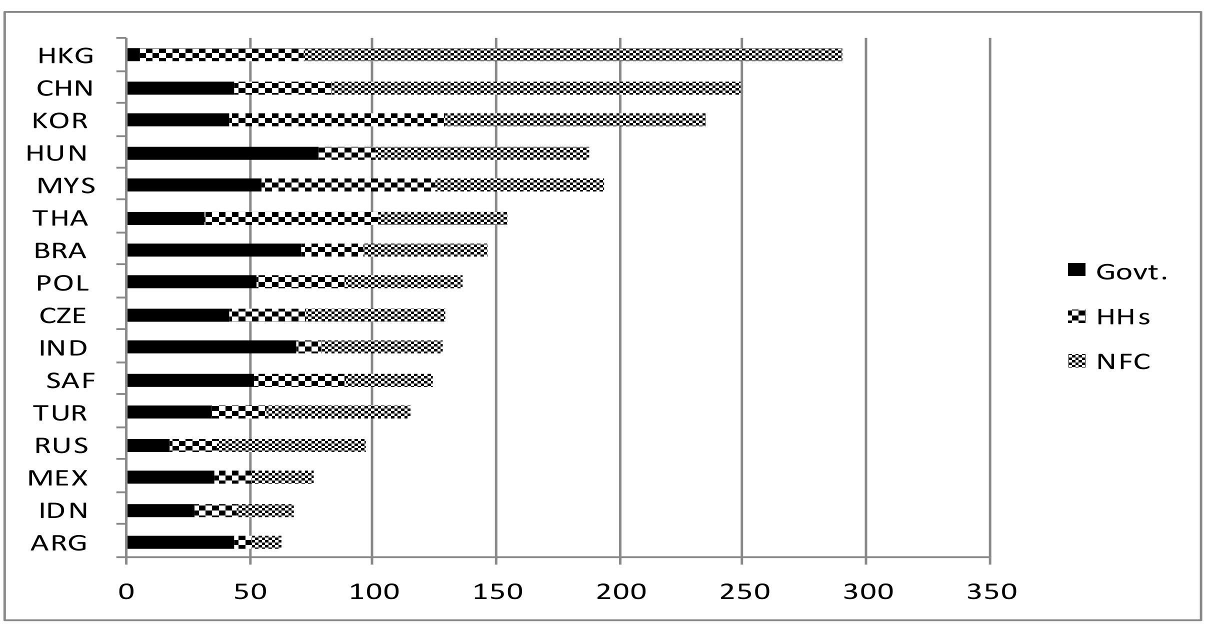
Source: own elaborations based on BIS total credit statistics. (Decomposition across sectors is only available after 2006)

Figure 7: Total Credit to the Non-financial Sector in Emerging Markets (% of GDP)



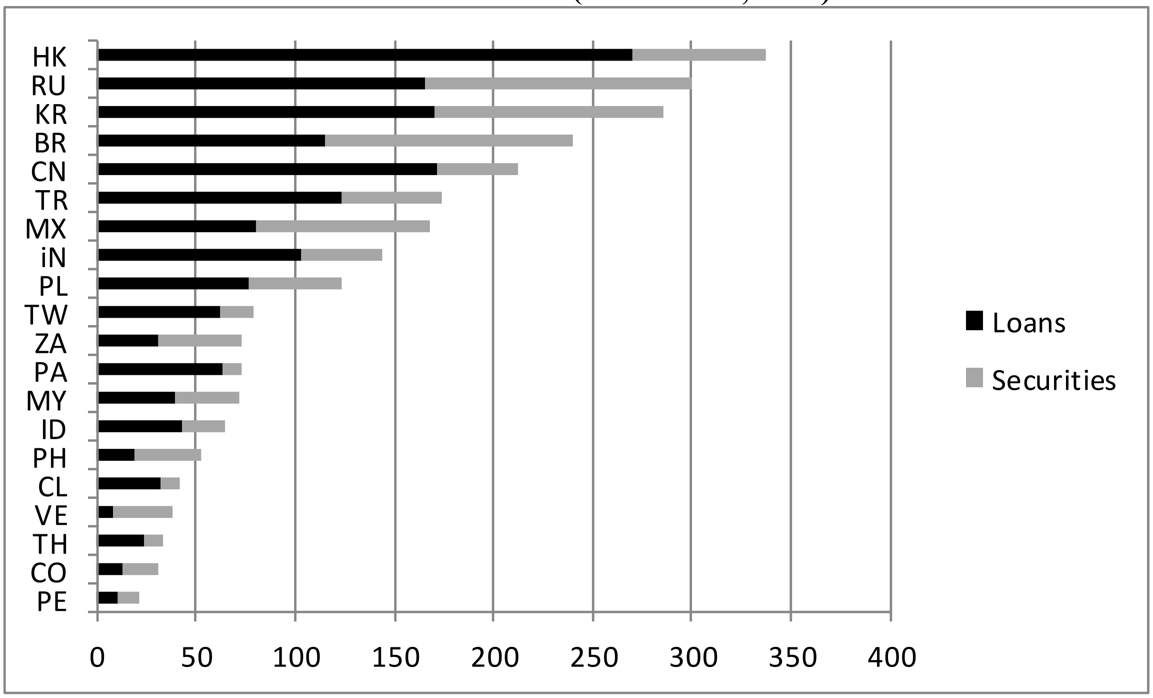
Source: own elaborations based on BIS total credit statistics

Figure 8: Composition of Credit to the Non-financial sector in Emerging Markets (% of GDP, 2015)



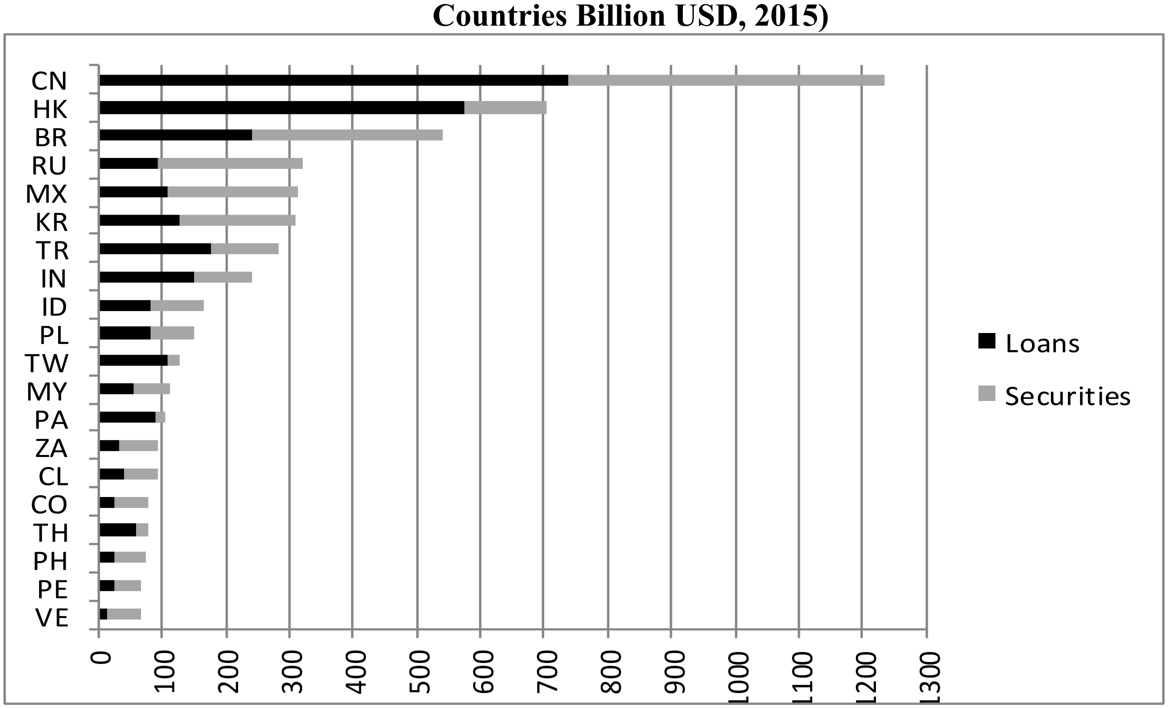
Source: own elaborations based on BIS total credit statistics

Figure 9: Claims of BIS Reporting Banks Vis-à-vis Residents of Selected Emerging Market Countries (billion USD, 2007)



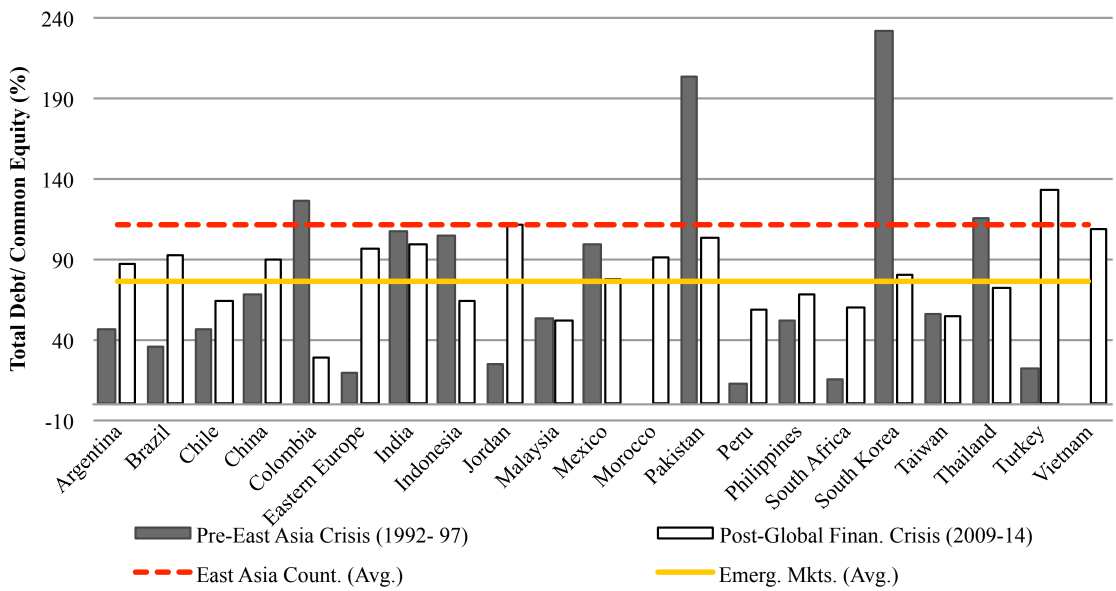
Source: own elaborations based on BIS data

Figure 10: Claims of BIS Reporting Banks vis-à-vis Residents of Selected Emerging Market Countries Billion USD, 2015)



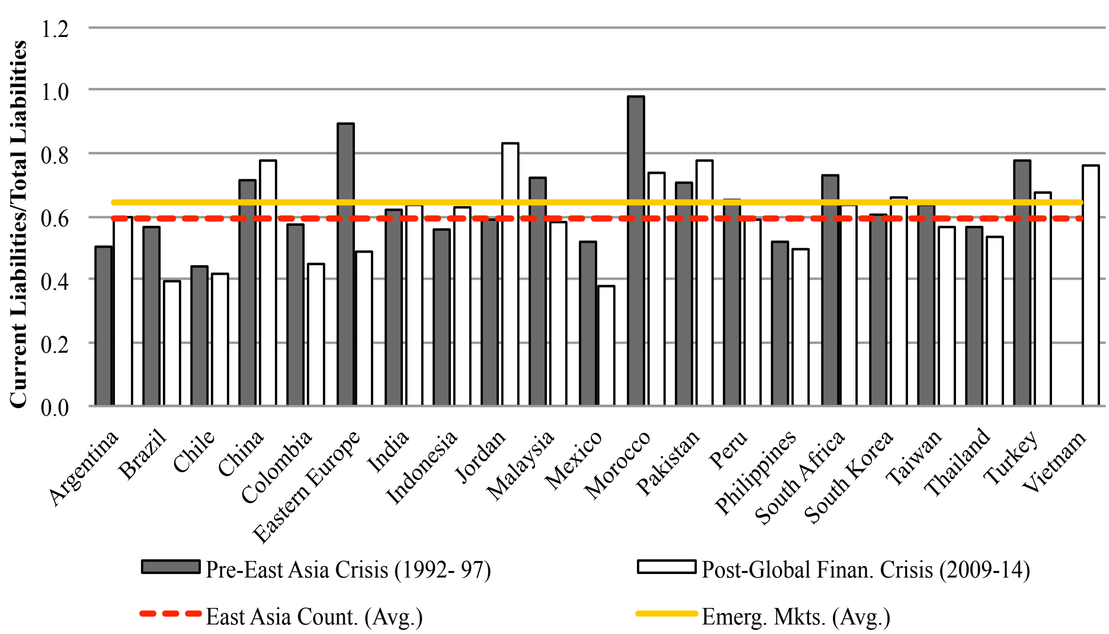
Source: own elaborations based on BIS data

Figure 11: Leverage (Weighted Mean)



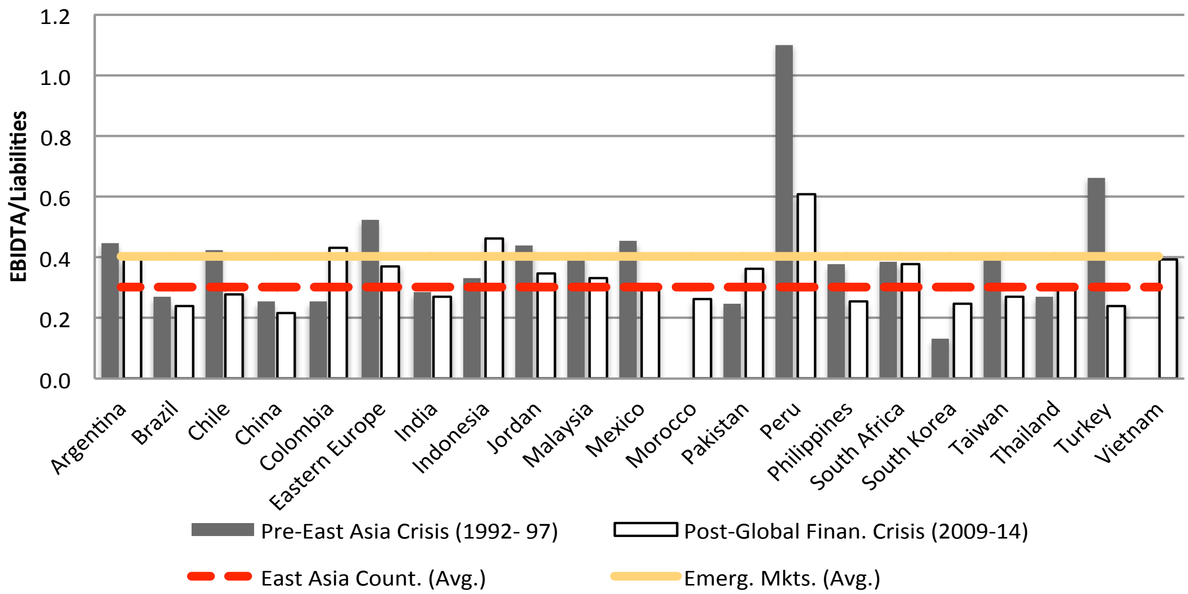
Source: own elaborations based on Worldscope and Orisis data.

Figure 12: Liquidity--Current to Total Liabilities (Weighted Mean)



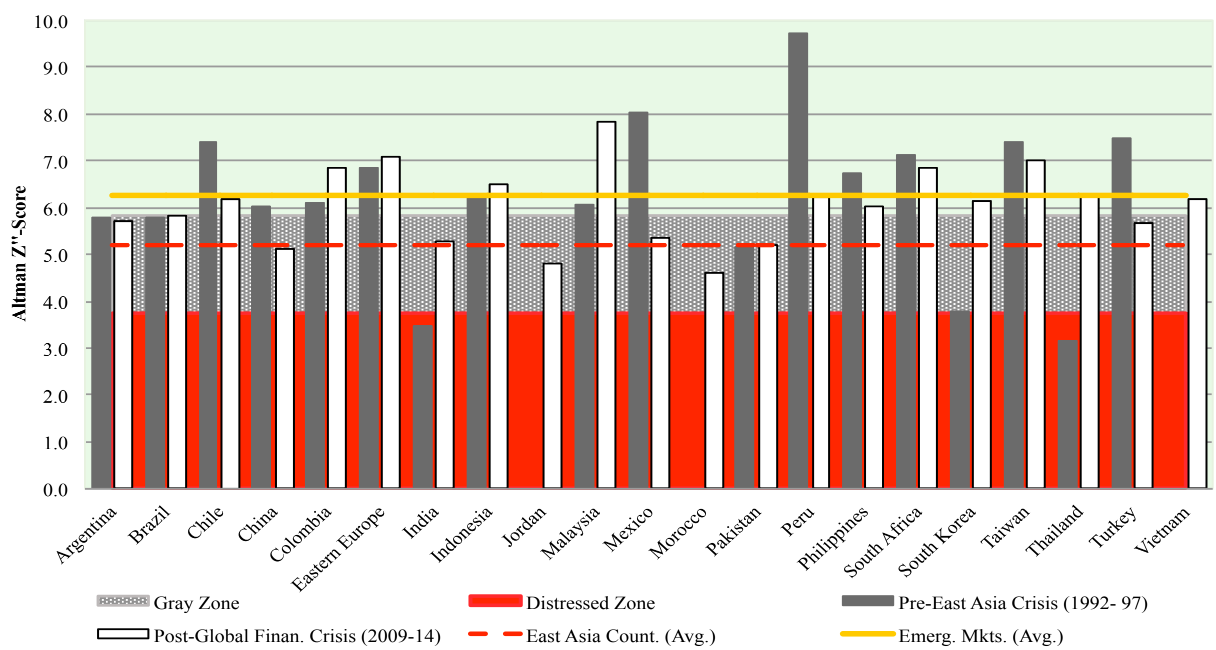
Source: own elaborations based on Worldscope and Orisis data.

Figure 13: Solvency-EBITDA to Total Liabilities (Weighted Mean)



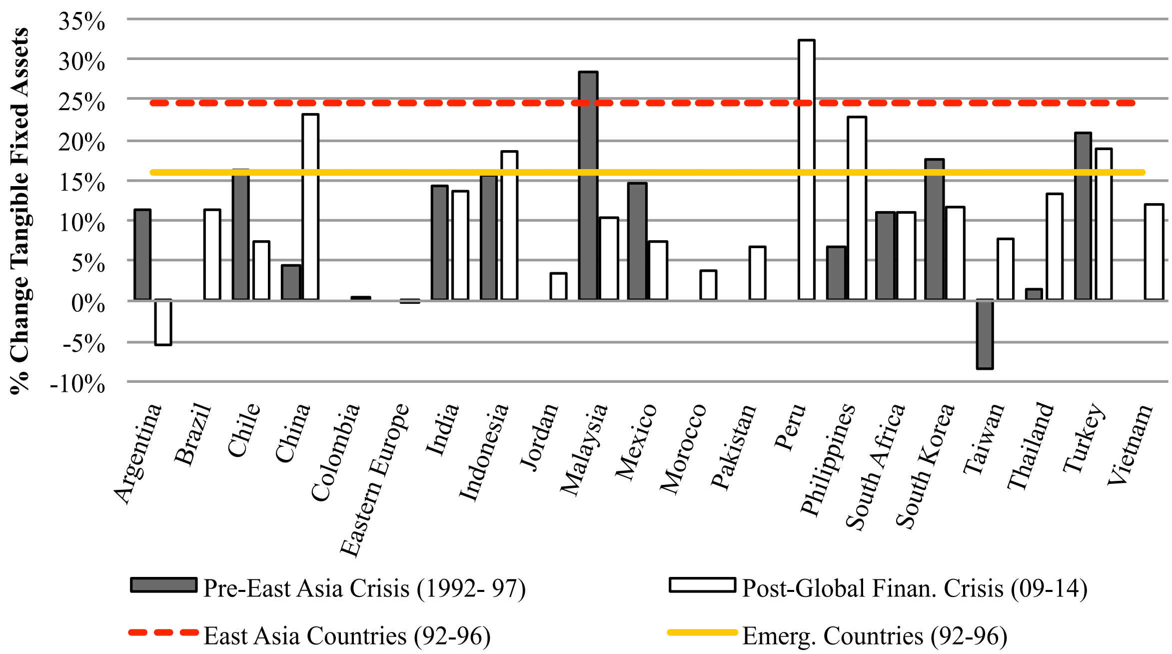
Source: own elaborations based on Worldscope and Orisis data.

Figure 14: Altman Z''-Score EM (Weighted Mean)



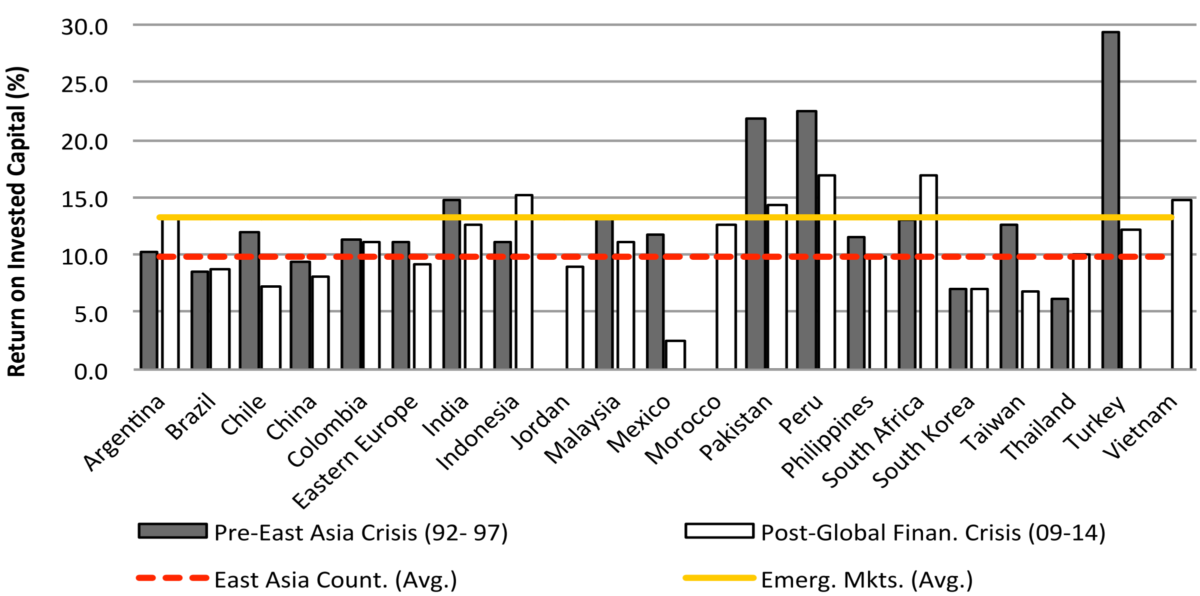
Source: own elaborations based on Worldscope and Orisis data.

Figure 15: Investment--Change in Tangible Assets (Weighted Mean)



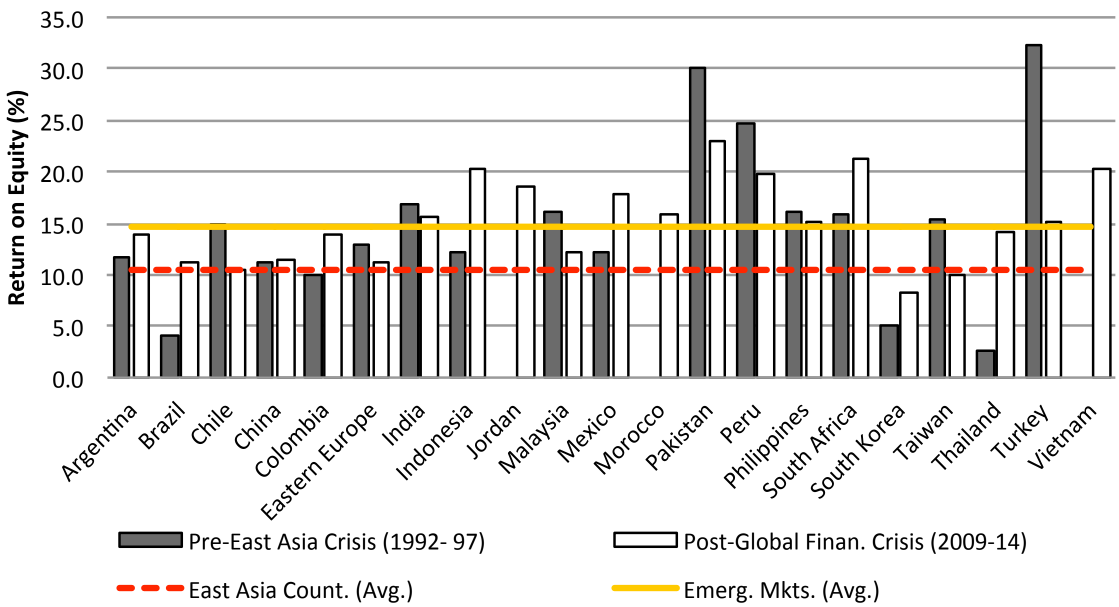
Source: own elaborations based on Worldscope and Orisis data.

Figure 16: Return on Invested Capital (Weighted Mean)



Source: own elaborations based on Worldscope and Orisis data.

Figure 17: Return on Equity (Weighted Mean)



Source: own elaborations based on Worldscope and Orisis data.

Table 1: Total Claims on Emerging Market Countries by BIS reporting Banks (billion USD)

	2007	2008	2009	2010	2011	2012	2013	2014	2015Q3
Emerging Markets									
Total	2,419	2,408	2,396	2,807	3,032	3,157	3,640	3,699	3,471
% top 5 curr.	81%	83%	81%	79%	79%	77%	77%	71%	74%
% USD	52%	53%	52%	53%	55%	53%	54%	55%	58%
Emerging Markets Ex-China									
Total	2,231	2,254	2,219	2,476	2,555	2,634	2,740	2,663	2,594
% top 5 curr.	82%	84%	81%	80%	81%	79%	81%	81%	82%
% USD	52%	53%	52%	53%	56%	55%	58%	61%	63%
Asia									
Total	830	738	783	1,064	1,258	1,349	1,801	1,945	1,752
% Total EM	34%	31%	33%	38%	41%	43%	49%	53%	50%
% top 5 curr.	78%	84%	80%	79%	79%	77%	74%	62%	65%
% USD	56%	58%	59%	59%	59%	56%	56%	53%	56%
Asia Ex China									
Total	641	584	606	733	782	826	901	908	874
% Total EM	26%	24%	25%	26%	26%	26%	25%	25%	25%
% top 5 curr.	81%	86%	84%	82%	85%	83%	84%	82%	83%
% USD	57%	59%	60%	61%	66%	64%	67%	69%	71%
Latin America									
Total	403	410	413	533	602	626	647	633	627
% Total EM	17%	17%	17%	19%	20%	20%	18%	17%	18%
% top 5 curr.	83%	84%	76%	76%	78%	78%	79%	82%	85%
% USD	70%	74%	67%	67%	70%	70%	71%	75%	79%
Developing Europe									
Total	728	786	722	711	690	698	713	609	559
% Total EM	30%	33%	30%	25%	23%	22%	20%	16%	16%
% top 5 curr.	79%	81%	80%	76%	76%	73%	77%	77%	77%
% USD	35%	33%	29%	28%	29%	27%	31%	32%	31%
Africa and Middle East									
Total	459	474	478	499	481	484	479	513	533
% Total EM	19%	20%	20%	18%	16%	15%	13%	14%	15%
% top 5 curr.	87%	84%	85%	84%	86%	83%	84%	83%	84%
% USD	58%	60%	62%	61%	63%	61%	61%	63%	65%

Source: Own elaborations based on BIS Locational Statistics. The data are for total claims (all instruments and all sectors) on residents of counterparty countries. Top five currencies are USD, euro, yen, British pound, and, Swiss franc.

Table 2: Outstanding International Bonds

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Emerging Markets									
All issuers (bill USD)	1,171	1,170	1,312	1,506	1,707	2,080	2,449	2,715	2,817
FC share	92%	92%	92%	93%	93%	93%	93%	93%	94%
USDshare	69%	69%	70%	72%	73%	74%	75%	76%	77%
NFC (bill USD)	354	363	438	526	625	763	947	1,075	1,143
FC share	87%	87%	88%	90%	91%	91%	91%	92%	92%
USDshare	75%	75%	75%	77%	77%	77%	78%	80%	80%
NFC/TOTAL	30%	31%	33%	35%	37%	37%	39%	40%	41%
Emerging Asia									
All issuers (bill USD)	338	342	376	435	513	623	780	985	1,101
Share of EM	29%	29%	29%	29%	30%	30%	32%	36%	39%
FC share	96%	95%	95%	94%	94%	92%	93%	93%	94%
USDshare	78%	77%	78%	78%	75%	74%	75%	76%	78%
NFC (bill USD)	139	143	164	195	234	275	359	447	503
Share of EM NFC	39%	39%	37%	37%	37%	36%	38%	42%	44%
FC share	94%	94%	95%	94%	93%	93%	94%	94%	95%
USDshare	79%	76%	79%	78%	75%	75%	79%	81%	82%
NFC/TOTAL	41%	42%	44%	45%	46%	44%	46%	45%	46%
Latin America									
All issuers (bill USD)	377	356	406	467	540	641	733	804	814
Share of EM	32%	30%	31%	31%	32%	31%	30%	30%	29%
FC share	92%	92%	92%	93%	93%	93%	93%	93%	93%
USDshare	74%	76%	77%	79%	81%	81%	82%	82%	82%
NFC (bill USD)	103	96	130	163	209	266	330	378	393
Share of EM NFC	29%	27%	30%	31%	34%	35%	35%	35%	34%
FC share	86%	85%	88%	92%	92%	91%	92%	90%	90%
USDshare	79%	79%	81%	83%	83%	81%	81%	81%	80%
NFC/TOTAL	27%	27%	32%	35%	39%	42%	45%	47%	48%
Emerging Europe									
All issuers (bill USD)	296	309	331	377	402	525	605	575	521
Share of EM	25%	26%	25%	25%	24%	25%	25%	21%	18%
FC share	93%	94%	93%	95%	95%	96%	95%	96%	96%
USDshare	55%	54%	52%	57%	60%	63%	64%	67%	67%
NFC (bill USD)	68	73	82	95	101	129	159	145	131
Share of EM NFC	19%	20%	19%	18%	16%	17%	17%	14%	12%
FC share	77%	80%	78%	83%	86%	87%	86%	89%	90%
USDshare	64%	66%	60%	65%	66%	68%	67%	68%	71%
NFC/TOTAL	23%	23%	25%	25%	25%	25%	26%	25%	25%
Africa and Middle East									
All issuers (bill USD)	160	162	199	227	252	291	331	351	381
Share of EM	14%	14%	15%	15%	15%	14%	14%	13%	14%
FC share	86%	83%	85%	87%	89%	89%	91%	92%	92%
USDshare	65%	64%	69%	71%	74%	75%	78%	79%	79%
NFC (bill USD)	45	51	62	73	81	93	99	105	115
Share of EM NFC	13%	14%	14%	14%	13%	12%	11%	10%	10%
FC share	83%	85%	84%	86%	88%	87%	89%	92%	92%
USDshare	70%	74%	74%	77%	81%	79%	82%	84%	83%
NFC/TOTAL	28%	32%	31%	32%	32%	32%	30%	30%	30%

Source: Own elaborations based on BIS international securities data. The data are on a national (as opposite to residency) basis and include all instruments. NFC are outstanding bonds by non-financial corporations.

Table 3: Outstanding International Bonds EM Ex-China and China

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Emerging Markets Ex-China									
All (bill USD)	1,130	1,123	1,265	1,434	1,589	1,906	2,173	2,279	2,287
Share of EM	97%	96%	96%	95%	93%	92%	89%	84%	81%
FC share	92%	92%	92%	93%	94%	94%	94%	94%	94%
USDshare	69%	69%	70%	72%	74%	75%	76%	77%	78%
NFC (bill USD)	333	337	411	483	554	667	792	848	863
FC share	86%	87%	88%	90%	91%	90%	90%	90%	91%
USDshare	80%	80%	80%	84%	87%	88%	93%	101%	106%
NFC/TOTAL	30%	30%	33%	34%	35%	35%	36%	37%	38%
Emerging Asia Ex-China									
All (bill USD)	297	296	328	363	394	449	505	549	571
Share of EM	25%	25%	25%	24%	23%	22%	21%	20%	20%
FC share	96%	96%	97%	96%	96%	95%	95%	96%	96%
USDshare	80%	79%	81%	80%	79%	78%	79%	80%	82%
NFC	118	117	137	153	163	179	204	220	223
Share of EM NFC	10%	10%	10%	10%	10%	9%	8%	8%	8%
FC share	94%	95%	95%	94%	93%	92%	92%	91%	92%
USDshare	82%	80%	82%	80%	78%	75%	77%	78%	79%
NFC/TOTAL	40%	40%	42%	42%	41%	40%	40%	40%	39%
China									
All (bill USD)	41	46	47	72	119	174	275	436	530
Share of EM	3%	4%	4%	5%	7%	8%	11%	16%	19%
FC share	92%	84%	84%	87%	87%	83%	87%	90%	92%
USDshare	69%	63%	60%	66%	64%	64%	67%	70%	73%
NFC	21	26	27	43	71	96	155	227	280
Share of EM NFC	6%	7%	6%	8%	11%	13%	16%	21%	24%
FC share	98%	89%	93%	95%	94%	95%	96%	97%	97%
USDshare	66%	60%	61%	70%	68%	76%	81%	84%	84%
NFC/TOTAL	51%	55%	57%	59%	59%	55%	56%	52%	53%

Source: Own elaborations based on BIS international securities data. The data are on a national (as opposite to residency) basis and include all instruments. NFC are outstanding bonds by non-financial corporations.

Table 4: Claims of BIS Reporting Banks Plus International Securities (Nationality Basis)

	All EMs	Africa	Asia	Asia Ex-China	China	Europe	Latin America	Latin America Ex-Brazil	Brazil	EMs Ex China and Brazil
	2007									
Cross-Border Claims by Reporting banks excluding securities	2,078	435	701	530	171	618	324	209	115	1,792
International Securities (including securities held by non-banks)	1170.822	159.52	338.357	297.405	40.952	295.692	377.253	256.457	120.796	1,009
Total	3,249	595	1,040	828	212	913	701	466	236	2,801
	2015									
Cross-Border Claims by Reporting banks excluding securities	3,039	510	1,480	741	739	509	540	298	242	2,058
International Securities (including securities held by non-banks)	2816.911	380.68	1101.255	570.897	530.358	520.558	814.418	521.157	293.261	1,993
Total	5,856	891	2,581	1,312	1,269	1,030	1,355	819	535	4,052
	Percentage change									
Cross-Border Claims by Reporting banks excluding securities	46%	17%	111%	40%	332%	-18%	67%	43%	110%	15%
International Securities (including securities held by non-banks)	141%	139%	225%	92%	1195%	76%	116%	103%	143%	98%
Total	80%	50%	148%	58%	499%	13%	93%	76%	127%	45%

Source: own elaborations based on BIS data.

Table 5: Leverage (Total Debt to Common Equity, %), Weighted Mean Emerging Markets (1992-1997 and 2009-2014)

Countries	Pre-East Asia Crisis (1992- 97)	Post-Global Finan. Crisis (2009-14)	Post-GFC minus Pre-E.A. Crisis 97	Is Post-GFC higher?	Post-GFC > E.Asia Countries?	Post-GFC > EM Avg. Pre-Asian Crisis?
Argentina	46.0	87.6	41.6	YES*	NO	YES
Brazil	35.8	92.4	56.6	YES*	NO	YES
Chile	47.3	64.5	17.3	YES*	NO*	NO*
China	68.7	89.8	21.2	YES	NO*	YES*
Colombia	126.7	28.9	-97.8	NO*	NO*	NO*
Eastern Europe	19.8	96.2	76.4	YES*	NO	YES
India	107.0	99.0	-7.9	NO	NO	YES
Indonesia	104.9	63.7	-41.2	NO*	NO*	NO*
Jordan	24.3	112.2	87.9	YES	YES	YES
Malaysia	53.8	52.3	-1.5	NO	NO*	NO*
Mexico	99.4	78.3	-21.1	NO	NO*	YES
Morocco		90.7			NO	YES
Pakistan	202.9	103.8	-99.2	NO*	NO	YES*
Peru	12.2	58.2	45.9	YES*	NO*	NO*
Philippines	51.8	68.5	16.7	YES	NO*	NO
South Africa	15.8	59.8	44.0	YES*	NO*	NO
South Korea	231.6	80.7	-150.9	NO*	NO*	YES
Taiwan	55.5	54.3	-1.3	NO	NO*	NO*
Thailand	114.9	72.8	-42.2	NO	NO*	NO
Turkey	22.4	133.0	110.6	YES*	YES	YES
Vietnam		109.0			NO	YES*
East Asia Count. (Avg.)	111.4	67.6	Yes	10	2	12
Emerg. Mkts. (Avg.)	75.8	80.7	No	9	19	9

Notes: Debt to equity ratio (a firm's total debt divided by its common equity). Data is weighted by sales by year and then averaged per period per country. Periods include the Pre-East Asia Crisis (1997-1997) and the Post-Global Financial Crisis (2009-2014). East Asian crisis countries include Indonesia, Malaysia, Philippines, South Korea, and Thailand. Asterisk (*) indicates p-value < 0.05. Sources: Worlscope and Orisis.

Table 6: Current to Total Liabilities, Weighted Mean
Emerging Markets (1992-1997 and 2009-2014)

Countries	Pre-East Asia Crisis (1992-97)	Post-Global Finan. Crisis (2009-14)	Post-GFC minus Pre-E.A. Crisis 97	Is Post-GFC higher?	Post-GFC > E.Asia Countries?	Post-GFC > EM Avg. Pre-Asian Crisis?
Argentina	51%	60%	9%	YES*	YES	NO
Brazil	57%	39%	-18%	NO*	NO*	NO*
Chile	44%	42%	-2%	NO	NO*	NO*
China	72%	78%	6%	YES	YES*	YES*
Colombia	57%	45%	-12%	NO*	NO	NO*
Eastern Europe	89%	49%	-40%	NO*	NO*	NO*
India	62%	64%	2%	YES	YES	NO
Indonesia	56%	63%	8%	YES	YES	NO
Jordan	59%	83%	24%	YES	YES	YES
Malaysia	72%	58%	-14%	NO*	NO	NO
Mexico	52%	38%	-14%	NO	NO*	NO*
Morocco	98%	74%	-24%	NO	YES	YES
Pakistan	70%	78%	8%	YES	YES*	YES
Peru	65%	59%	-6%	NO	NO	NO
Philippines	52%	50%	-2%	NO	NO*	NO*
South Africa	73%	63%	-9%	NO*	YES	NO
South Korea	60%	66%	6%	YES	YES	YES
Taiwan	64%	57%	-7%	NO	NO	NO*
Thailand	57%	54%	-3%	NO	NO	NO*
Turkey	77%	68%	-10%	NO*	YES	YES
Vietnam		76%	76%		YES*	YES*
East Asia Count. (Avg.)	59%	58%	Yes	7	10	7
Emerg. Mkts. (Avg.)	64%	60%	No	13	10	14

Notes: Current to Total Liabilities. Data is weighted by sales by year then average per period per country. Periods include the Pre-East Asia Crisis (1997-1997) and the Post-Global Financial Crisis (2009-2014). East Asian crisis countries include Indonesia, Malaysia, Philippines, South Korea, and Thailand. Asterisk (*) indicates p-value < 0.05. Sources: Worlscope and Orisis.

Table 7: EBIDTA to Total Liabilities, Weighted Mean
Emerging Markets (1992-1997 and 2009-2014)

Countries	Pre-East Asia Crisis (1992-97)	Post-Global Finan. Crisis (2009-14)	Post-GFC minus Pre-E.A. Crisis 97	Is Post-GFC higher?	Post-GFC > E.Asia Countries?	Post-GFC > EM Avg. Pre-Asian Crisis?
Argentina	45%	39%	-6%	NO	YES	NO
Brazil	27%	24%	-3%	NO	NO*	NO*
Chile	43%	28%	-15%	NO*	NO	NO*
China	25%	22%	-4%	NO*	NO*	NO*
Colombia	25%	43%	18%	YES*	YES	YES
Eastern Europe	52%	37%	-15%	NO*	YES	NO
India	28%	27%	-1%	NO	NO*	NO*
Indonesia	33%	46%	13%	YES*	YES*	YES
Jordan	44%	34%	-9%	NO	YES	NO
Malaysia	40%	33%	-7%	NO	YES	NO*
Mexico	45%	30%	-15%	NO	NO	NO*
Morocco		26%	26%		NO	NO*
Pakistan	25%	36%	12%	YES	YES	NO
Peru	110%	61%	-50%	NO*	YES*	YES*
Philippines	38%	25%	-12%	NO*	NO*	NO*
South Africa	38%	38%	-1%	NO	YES*	NO
South Korea	13%	25%	12%	YES*	NO	NO*
Taiwan	41%	27%	-14%	NO*	NO	NO*
Thailand	27%	31%	3%	YES	YES	NO*
Turkey	66%	24%	-42%	NO*	NO*	NO*
Vietnam		40%	40%		YES*	NO
East Asia Count. (Avg.)	30%	32%	Yes	5	11	3
Emerg. Mkts. (Avg.)	40%	33%	No	14	10	18

Notes: Coverage ratio (the ratio of earnings before interest, taxes, and depreciation to total liabilities). Data is weighted by sales by year and then averaged per period per country. Periods include the Pre-East Asia Crisis (1997-1997) and the Post-Global Financial Crisis (2009-2014). East Asian crisis countries include Indonesia, Malaysia, Philippines, South Korea, and Thailand. Asterisk (*) indicates p-value < 0.05. Sources: Worlscope and Orisis.

Table 8: Altman EM Zscore, Weighted Mean
Emerging Markets (1992-1997 and 2009-2014)

Countries	Pre-East Asia Crisis (1992-97)	Post-Global Finan. Crisis (2009-14)	Post-GFC minus Pre-E.A. Crisis 97	Is Post-GFC higher?	Post-GFC > E.Asia Countries?	Post-GFC > EM Avg. Pre-Asian Crisis?
Argentina	5.8	5.7	-0.1	NO	YES	NO
Brazil	5.8	5.8	0.0	NO	YES	NO
Chile	7.4	6.2	-1.2	NO*	YES*	NO
China	6.0	5.1	-0.9	NO	NO	NO*
Colombia	6.1	6.8	0.7	YES*	YES	YES
Eastern Europe	6.9	7.1	0.2	YES	YES*	YES
India	3.5	5.3	1.8	YES*	YES	NO
Indonesia	6.3	6.5	0.2	YES	YES	YES
Jordan		4.8	4.8		NO	NO
Malaysia	6.1	7.8	1.8	YES	YES*	YES
Mexico	8.1	5.4	-2.7	NO*	YES	NO
Morocco		4.6	4.6		NO	NO*
Pakistan	5.2	5.2	0.0	NO	NO	NO*
Peru	9.7	6.2	-3.5	NO*	YES*	NO
Philippines	6.7	6.0	-0.7	NO	YES	NO
South Africa	7.1	6.9	-0.3	NO	YES*	YES
South Korea	3.8	6.1	2.3	YES*	YES*	NO
Taiwan	7.4	7.0	-0.4	NO	YES*	YES
Thailand	3.1	6.3	3.1	YES	YES	YES
Turkey	7.5	5.7	-1.8	NO*	YES	NO
Vietnam		6.2	6.2		YES	NO
East Asia Count. (Avg.)	5.2	6.6	Yes	7	17	7
Emerg. Mkts. (Avg.)	6.2	6.0	No	11	4	14

Notes: Altman (2005) Emerging Market Z-Score. Data is weighted by sales by year and then averaged per period per country. Periods include the Pre-East Asia Crisis (1997-1997) and the Post-Global Financial Crisis (2009-2014). East Asian crisis countries include Indonesia, Malaysia, Philippines, South Korea, and Thailand. Asterisk (*) indicates p-value < 0.05. Sources: Worlscope and Orisis.

Table 9: Tangible Fixed Assets (Change, %), Weighted Mean Emerging Markets (1992-1997 and 2009-2014)

Countries	Pre-East Asia Crisis (1992-97)	Post-Global Finan. Crisis (09-14)	Post-GFC minus Pre-E.A. Crisis 97	Is Post-GFC higher?	Post-GFC > E.Asia Countries?	Post-GFC > EM Avg. Pre-Asian Crisis?
Argentina	13%	-5%	-17%	NO*	NO*	NO*
Brazil		11%	11%		NO	NO
Chile	15%	7%	-9%	NO*	NO*	NO*
China	3%	23%	19%	YES*	NO*	YES*
India	13%	14%	-1%	YES	NO	NO
Indonesia	25%	18%	3%	NO	NO	YES
Jordan		4%			NO*	NO*
Malaysia	38%	10%	-18%	NO	NO	NO
Mexico	15%	7%	-7%	NO*	NO*	NO*
Morocco		4%			NO*	NO*
Pakistan		7%			NO*	NO
Peru		33%			YES*	YES*
Philippines	13%	23%	16%	YES	YES	YES
South Africa	11%	11%	0%	YES	NO	NO
South Korea	31%	12%	-6%	NO	NO*	NO
Taiwan	-7%	8%	16%	YES*	NO	NO
Thailand	15%	13%	12%	NO	NO	NO
Turkey	21%	19%	-2%	NO	NO	YES
Vietnam		12%			NO*	NO
East Asia Count. (Avg.)	25%	15%	Yes	5	1	5
Emerg. Mkts. (Avg.)	16%	11%	No	8	20	16

Notes: Tangible fixed assets, change. Data is weighted by sales by year and then averaged per period per country. Periods include the Pre-East Asia Crisis (1997-1997) and the Post-Global Financial Crisis (2009-2014). East Asian crisis countries include Indonesia, Malaysia, Philippines, South Korea, and Thailand. Asterisk (*) indicates p-value < 0.05. Sources: Worlscope and Orisis.

Table 10: Return on Invested Capital, Weighted Mean Emerging Markets (1992-1997 and 2009-2014)

Countries	Pre-East Asia Crisis (92- 97)	Post-Global Finan. Crisis (09-14)	Post-GFC minus Pre-E.A. Crisis 97	Is Post-GFC higher?	Post-GFC > E.Asia Countries?	Post-GFC > EM Avg. Pre-Asian Crisis?
Argentina	10.3	13.3	3.0	YES	YES	YES
Brazil	8.6	8.8	0.2	YES	NO*	NO*
Chile	11.9	7.1	-4.8	NO*	NO*	NO*
China	9.4	8.0	-1.4	NO	NO*	NO*
Colombia	11.4	11.1	-0.2	NO	YES	NO
Eastern Europe	11.2	9.1	-2.1	NO	NO	NO*
India	14.8	12.5	-2.3	NO*	YES*	NO
Indonesia	11.2	15.3	4.1	YES	YES*	YES
Jordan		9.0	9.0		NO	NO*
Malaysia	13.3	11.1	-2.2	NO	YES	NO
Mexico	11.7	2.5	-9.2	NO	NO*	NO*
Morocco		12.7	12.7		YES	NO
Pakistan	21.9	14.2	-7.7	NO*	YES*	YES
Peru	22.5	16.8	-5.7	NO	YES*	YES
Philippines	11.5	9.9	-1.6	NO	YES	NO*
South Africa	13.0	16.9	3.9	YES*	YES*	YES*
South Korea	7.0	7.0	0.1	YES	NO*	NO*
Taiwan	12.5	6.7	-5.8	NO*	NO*	NO*
Thailand	6.1	10.0	3.8	YES	YES	NO*
Turkey	29.4	12.1	-17.3	NO	YES	NO
Vietnam		14.8	14.8		YES*	YES
East Asia Count. (Avg.)	9.8	10.7	Yes	7	13	6
Emerg. Mkts. (Avg.)	13.2	10.9	No	12	8	15

Notes: Return on invested capital (ROIC) is the ratio of operating profit (earnings before interest and tax) to invested capital (sum of shareholders' equity and debt liabilities). Data is weighted by sales by year and then averaged per period per country. Periods include the Pre-East Asia Crisis (1997-1997) and the Post-Global Financial Crisis (2009-2014). East Asian crisis countries include Indonesia, Malaysia, Philippines, South Korea, and Thailand. Asterisk (*) indicates p-value < 0.05. Sources: Worlscope and Orisis.

Table 11: Return on Equity, Weighted Mean
Emerging Markets (1992-1997 and 2009-2014)

Countries	Pre-East Asia Crisis (1992-97)	Post-Global Finan. Crisis (2009-14)	Post-GFC minus Pre-E.A. Crisis 97	Is Post-GFC higher?	Post-GFC > E.Asia Countries?	Post-GFC > EM Avg. Pre-Asian Crisis?
Argentina	11.8	13.9	2.1	YES	YES	NO
Brazil	4.0	11.2	7.1	YES*	YES	NO*
Chile	14.8	10.5	-4.3	NO*	YES	NO*
China	11.2	11.5	0.3	YES	YES	NO*
Colombia	10.0	13.9	3.9	YES	YES	NO
Eastern Europe	12.9	11.1	-1.8	NO	YES	NO*
India	16.8	15.5	-1.2	NO*	YES*	YES
Indonesia	12.2	20.3	8.1	YES	YES*	YES*
Jordan		18.7	18.7		YES	YES
Malaysia	16.1	12.2	-3.9	NO*	YES	NO*
Mexico	12.2	17.7	5.5	YES	YES*	YES
Morocco		15.9	15.9		YES	YES
Pakistan	30.0	23.0	-7.1	NO*	YES*	YES*
Peru	24.7	19.7	-5.0	NO	YES*	YES*
Philippines	16.1	15.0	-1.1	NO	YES*	YES
South Africa	15.9	21.3	5.4	YES*	YES*	YES*
South Korea	5.0	8.2	3.2	YES	NO*	NO*
Taiwan	15.3	9.9	-5.4	NO*	NO	NO*
Thailand	2.6	14.2	11.6	YES	YES	NO
Turkey	32.2	15.2	-17.0	NO	YES*	YES
Vietnam		20.2	20.2		YES*	YES*
East Asia Count. (Avg.)	10.4	14.0	Yes	10	19	11
Emerg. Mkts. (Avg.)	14.7	15.2	No	9	2	10

Notes: Return on Equity (ROE) is the amount of net income returned as a percentage of shareholders' equity. Data is weighted by sales by year and then averaged per period per country. Periods include the Pre-East Asia Crisis (1997-1997) and the Post-Global Financial Crisis (2009-2014). East Asian crisis countries include Indonesia, Malaysia, Philippines, South Korea, and Thailand. Asterisk (*) indicates p-value < 0.05. Sources: Worlscope and Orisis.

Appendix Table A: Data Coverage--Sample Size for Different Indicators

Country	Altman Z	Coverage	Leverage	Liabilities	ROE	ROIC	Tangible	Tobin-Q
	Panel A: 1992-1997							
Argentina	6	8	10	10	8	8	6	3
Brazil	9	24	30	31	28	29		17
Chile	37	39	37	38	38	38	54	34
China		1	8	7	8	8	1	3
Colombia	14	14	19	17	16	16		12
Eastern Europe	3	5	4	3			1	3
India		106	103	104	16	16	18	83
Indonesia	35	47	46	40	44	46	14	41
Malaysia	22	115	87	92	92	92	71	96
Mexico	21	23	28	29	21	21	19	5
Pakistan	31	32	31	32	11	11		3
Peru	5	6	7	8	4	4		3
Philippines	9	25	21	22	25	25	12	30
South Africa	30	32	29	32	30	30	9	29
South Korea	17	23	58	70	59	62	134	69
Taiwan	4	6	7	7	7	7	2	7
Thailand	3	90	92	80	56	57	35	88
Turkey	23	14	22	24	21	21	11	16
SUM	263	610	639	646	484	491	387	542
	Panel B: 2009-2014							
Argentina	47	59	53	63	63	66	64	56
Brazil	98	220	188	223	195	208	226	222
Chile	93	113	114	141	149	154	126	132
China	1522	1891	1733	2185	1915	1948	2559	1618
Colombia	24	31	39	44	40	45	20	35
Eastern Europe	514	559	511	740	659	684	489	555
India	102	1727	1340	1765	1409	1371	2326	1719
Indonesia	115	256	211	267	248	261	296	231
Jordan	30	65	69	56	117	119	111	118
Malaysia	516	724	601	691	686	382	425	723
Mexico	60	76	66	83	73	63	85	73
Morocco	28	39	43	42	50	50	49	51
Pakistan	68	160	115	169	125	144	232	113
Peru	40	59	57	69	68	70	76	72
Philippines	79	127	95	122	141	143	133	141
South Africa	145	194	164	188	193	165	169	196
South Korea	1047	1421	1109	1444	1293	1325	1029	1300
Taiwan	157	190	157	190	178	179	1338	162
Thailand	101	455	333	391	419	428	481	431
Turkey	156	228	182	227	223	231	216	211
Vietnam	314	374	331	442	375	428	713	250
SUM	5256	8968	7511	9542	8619	8464	11163	8409

Sources: Worlscope and Orisis.