

Not another Emerging Market Crisis

Jeremy Lawson & Nicolas Jaquier | Standard Life Investments | October 2014

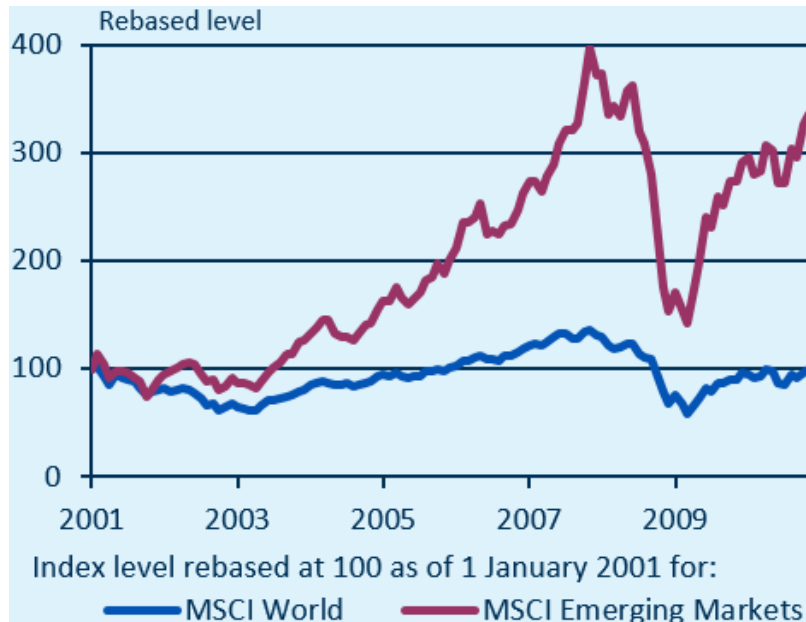
Most emerging market economies will face a more challenging economic and financial outlook over the next few years. We have developed a heat-map to assess the vulnerability of countries to future shocks. It allows us to analyse a considerable amount of data, compare the results with previous episodes, and provide a screening tool to enable more focused analysis. We find that there are pockets of vulnerability, in countries like Venezuela and the Ukraine, and a broader crisis could be triggered by a major slowdown in China or sizeable increases in US interest rates. Overall, however systemic risk is lower than before the Asian crisis.

Investors can use heat-maps to improve their understanding of a large quantity of economic and financial data. In this publication, we set out some of the current threats facing emerging market economies. We survey the extensive literature on emerging market crises and identify the financial, economic and institutional variables that have been the best predictors of past crises. We describe how our heat-map has been created, and list those countries which are currently most and least vulnerable to shocks.

1. A MORE CHALLENGING ENVIRONMENT

The first decade of the 21st century was particularly kind to the emerging market complex. Economic growth was exceptionally strong, which allowed living standards in a wide range of countries to converge rapidly on those of the developed economies. Institutional frameworks also improved as many governments put in place fiscal rules, opened their capital accounts and abandoned exchange rate pegs in favour of central bank inflation targeting regimes. This benign economic and financial backdrop helped to draw in significant capital inflows and delivered positive excess returns across most asset classes (see Chart 1).

Chart 1: Emerging markets outperform until 2010



Source: Datastream (as of 1 December 2010)

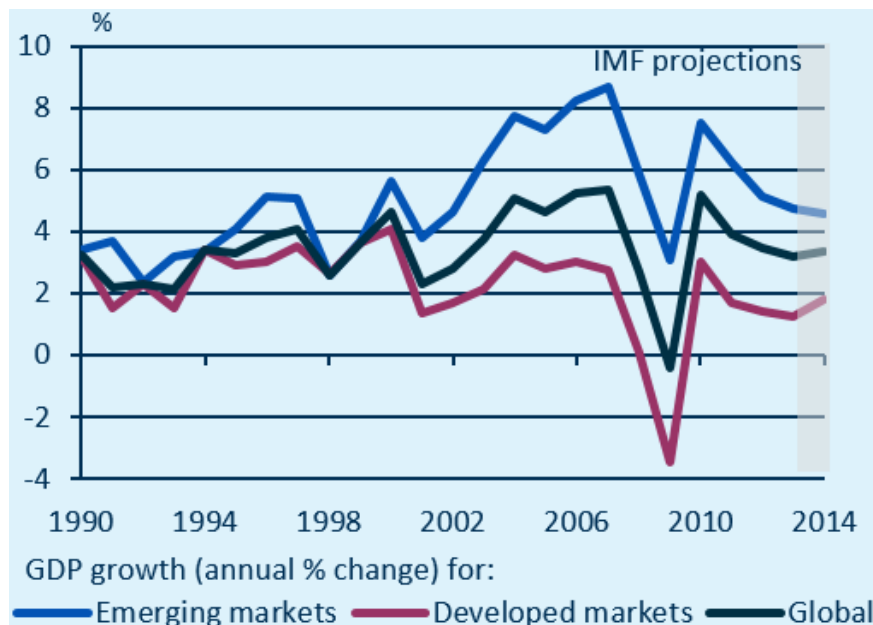
More recently, however, some of this gloss has worn off. The external environment has become less favourable as the economic recovery in the developed economies has remained tepid, while global trade growth remains much weaker than in the years before the financial crisis. At the same time, the Chinese economy, which has been an important driver of emerging market growth over the past decade, is growing at a slower pace, and credit and investment imbalances have increased the risk of a hard landing. The terms of trade for commodity exporting countries are also trending down after a decade long boom. Meanwhile, the gradual stabilisation of the US economy and reduction in Eurozone tail-risk may reduce the incentive for private capital to flow into emerging markets in the coming years.

Policymakers are facing greater challenges on the domestic front too. Whereas most developed economies have been through a wrenching deleveraging process over the past six years, the combination of easy monetary policy at home and large capital inflows has seen economy-wide leverage increase significantly in some emerging markets. Hence, additional credit extension is unlikely to provide as much support to economic growth going forward. In addition, progress on structural reforms has come to a standstill in all but a few countries. This is undermining trend productivity and potential growth, especially as demographic trends are less favourable than they were in the past.

The consequence of all of this is that although emerging markets are, in aggregate, still growing much more rapidly than the developed economies, their growth advantage is

shrinking. Indeed, 2014 will probably see the smallest growth differential since 2001; although it will remain much higher than its average during the 1990s (see Chart 2). Emerging market assets have also underperformed over the past 18 months. This is most obvious in the case of equities but many currencies also depreciated in trade-weighted terms.

Chart 2: Growth differential declining



Sources: IMF, Datastream (as of July 2014)

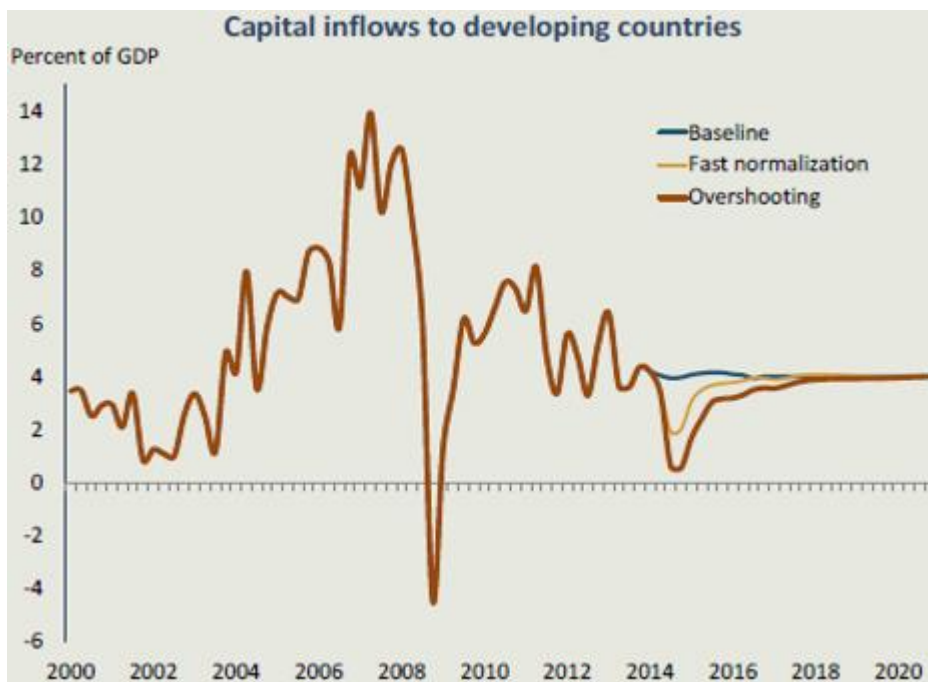
Against this backdrop, one of the burning questions within the investor community is whether a systemic emerging market crisis is on the horizon. In particular, how will the emerging market world cope with the normalisation of US monetary policy? Will higher borrowing costs in developed countries cause problems for some highly indebted emerging countries or companies? Was the sell-off in emerging markets equities last summer, during the taper tantrum, a precursor of more difficult times ahead?

To answer these questions we first survey the extensive literature on emerging market crises and identify the financial, economic and institutional variables that have been the best predictors of past crises. We then put these indicators together into a heat-map for 23 of the most important emerging markets, which we use to assess which countries have the greatest and least vulnerabilities. We have also compiled a heat-map for the same set of countries prior to the 1997-98 Asian crisis, both to compare the two situations as well as test the predictive ability of our framework. These heat-maps should be thought of as a type of early-warning system rather than a device for forecasting when a crisis might actually occur.

Our broad conclusion is that although fragilities have increased in some countries since the global financial crisis, the risks of a systemic crisis remain considerably lower than they were prior to the Asian shock. There are a small number of economies that appear vulnerable to a sudden stop in capital flows, but both the number of countries at risk and their importance to global economy and financial markets is smaller than was the case in 1996–97. Indeed, one of our key findings is that emerging market economies are a much more heterogeneous group than in the 1990s, with many having put in place more orthodox policy frameworks and built up significant buffers to shocks.

That said there are important threats that investors need to be cognisant of. In particular, a sharp increase in global interest rates or a hard landing in China could both undermine financial stability in a number of countries (see Chart 3). Global investors would be reassured if emerging market policymakers took advantage of the current economic upswing in the developed economies to reduce these vulnerabilities by accelerating structural reforms and strengthening institutional frameworks.

Chart 3: Interest rate risk



Source: World Bank (as of January 2014)

Before setting out these arguments in more detail, we should note that we do not formally assess China’s vulnerability to a crisis in this report. China has been excluded for three main reasons. First, we think that the complexities of China’s situation deserve a separate analysis, which we are carrying out. Secondly, we did not want the controversies surrounding China to detract from our analysis of other, smaller emerging markets, which tend to get

much less attention. Finally, our approach allows us to treat a possible Chinese hard landing as an exogenous event that other emerging markets have varying degrees of exposure to.

2. CRISIS INDICATORS

Given the enormous impact that emerging market crises can have on economies, living standards and asset prices, it is unsurprising that there is a vast literature examining whether specific economic, financial and institutional variables can help predict them ahead of time. This task is made complex by a number of factors. First, crises manifest themselves differently both across countries and across time. For example, the variables that best predict sudden stops of capital inflows and balance of payments crises may be different from those that predict sovereign debt or banking crises. Similarly, if one were to focus only on the 1990s Asian crisis it would be easy to conclude that measures of the health of a country's public finances are irrelevant for predicting crises, while the opposite conclusion would be reached when drawing out the lessons from the Latin American debt crises of the 1980s. Because there is little point in being able to predict the last crisis but not the next one we believe that it is necessary to cast the net for potential early warning indicators as widely as possible.

Secondly, there is, and can be, no perfect system for predicting crises in emerging markets. Even models that have been designed retrospectively to explain the rolling crises that occurred between late 1997 and the end of 1998 have identified anomalies – countries that were caught up in the crisis even though their fundamentals appeared sound or countries that were spared despite apparently poor fundamentals. A key reason for these false signals is that investor sentiment itself can be very hard to predict. Contagion and panic are powerful forces in any crisis as losses on assets in one country trigger outflows from others. Nobody wants to be the last person through the door in a fire. Another reason why early warning systems are not fool-proof is that there are things that cannot be known ahead of time. Sometimes the data simply does not exist to identify properly particular risks, or the inter-linkages within a country or across countries are poorly understood. The global financial crisis was a perfect example of this.

Nevertheless, there are indicators that increase the vulnerability of an individual country to a crisis, which fall into five main categories. We examine in turn – external imbalances, domestic private sector imbalances, unsustainable trends in public finances, exposures to foreign financial or economic shocks, and institutional weaknesses. Many of the crisis indicators we have identified are of course inter-related. An overheated domestic credit market is often associated with strong portfolio capital inflows and a rising current account deficit. Similarly, a large government budget deficit can also drive up the current account deficit, and institutional weaknesses such as the wrong exchange rate or monetary policy regime can exacerbate external and domestic imbalances. They do not all have to be present at once but a combination of these vulnerabilities has almost always been present when

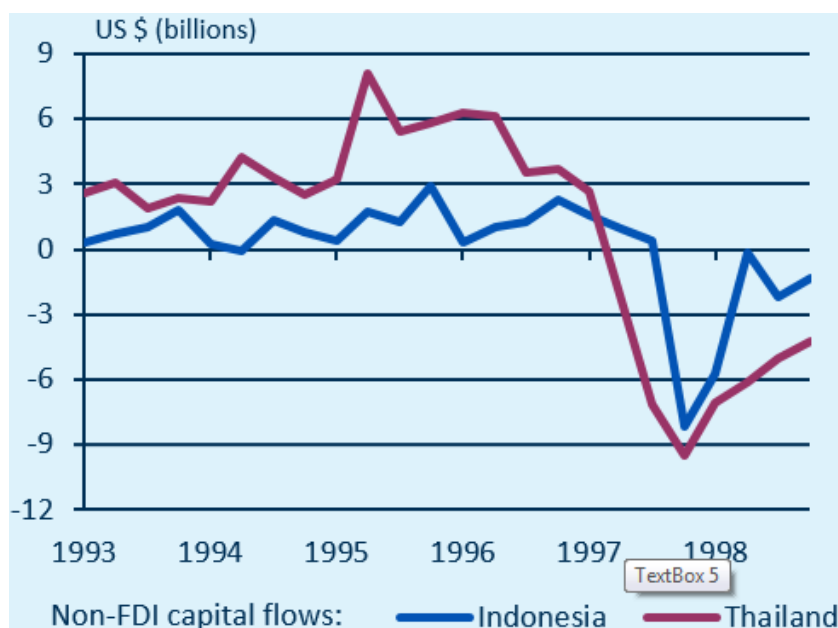
crises have occurred in the past.

2.1 External imbalances

Most emerging economies are intricately linked into the world economy through both real trade linkages and financial flows (see Box 1 for a primer on the balance of payments). As domestic capital markets deepened over the years and capital accounts were gradually liberalised, financial links have gained in importance relative to trade flows. While trade flows remain predominant for frontier markets, global shocks are now more likely to propagate to major emerging markets through the financial channel.

As a consequence of these trade and financial linkages, one of the canonical types of crisis that emerging markets are subject to is a so-called 'sudden stop', during which private capital inflows dry up suddenly, forcing the current account deficit to close immediately and precipitating a collapse in the currency and other domestic asset prices, which usually leads to a sharp recession. This is precisely what happened to Thailand and Indonesia in 1997, signalling the beginning of the Asian crisis (see Chart 4). Naturally, the best predictors of this type of crisis are indicators of external imbalances. Countries that have required strong capital inflows to finance large current account deficits are obviously most at risk of a sudden stop, particularly if those deficits have mainly been financed by short-term foreign debt or portfolio equity (Calvo and Reinhart, 2000; Summers, 2000; Dornbusch, 2001; Edwards, 2004).

Chart 4: Asia's sudden stop



Source: Datastream (as of Q4 1998)

The level of international reserves is also important because they can act as the safety valve that absorbs the decline in private capital inflows rather than sharply declining imports (Aizenman and Lee, 2006). Here the variable that seems to matter the most is the ratio of short-term external debt to gross international reserves (Allen et al, 2002; Edwards, 2004). When that ratio is well above 100 a country will run out of reserves if foreign investors refuse to roll-over the credit they have extended to domestic residents. Finally, crises are more likely to occur when exchange rates are overvalued. This is partly because they usually accompany other imbalances but also because the sharp currency depreciations that often follow are very disruptive, particularly when there is considerable domestic private or public sector debt denominated in foreign currencies (Calvo and Reinhart, 2000; Dornbusch, 2001).

BOX 1: A PRIMER ON THE BALANCE OF PAYMENTS AND ECONOMIC IMBALANCES

Many of the indicators in our heat map are either directly or indirectly connected to each other via the standard international macroeconomic accounting identities. This interconnectedness reflects the fact that economic imbalances rarely remain contained to one sector, but often spill over to other parts of the economy. Likewise, misguided macroeconomic policies often have unintended consequences even when aimed targeted at a specific sector of the economy.

The balance of payments records all transactions between residents of one country and the rest of the world. By definition, the balance must sum up to zero and is composed of two major elements: the current account and the financial account (the latter is also often called the capital account).

$$\text{Id (1) Balance of Payments} = \text{Current Account} + \text{Financial Account} = 0$$

The current account measures the value of the sale and purchase of goods and services for immediate consumption or investment; transactions that do not generate future claims. In contrast, the financial account measures the value of the exchange of assets between residents and non-residents of a country, which are claims of one on the other at a future date.

$$\text{Id (2) Current Account} = \text{Goods and Services Trade Balance} + \text{Net Income} + \text{Transfers}$$

The current account itself is comprised of the trade balance on goods and services, the net income balance from the payments and receipts on asset holdings, as well as transfers (remittances). Unless a country has very large net foreign assets or liabilities, the largest component of the current account is usually the trade balance. Thus, when the value of a country's imports exceeds the value of their exports and they run a current account deficit, they are often said to be living beyond their means. The shortfall must be financed, either by the sale of assets or by sourcing finance from abroad, transactions which are recorded in the financial account.

$$\text{Id (3) Financial Account} = \text{FDI} + \text{Portfolio Investment} + \text{Other (Loans, Currency and Deposits)} + \text{Change in Reserves}$$

In turn, foreign financing can come in various forms. Residents can sell stakes in investment projects and corporate entities, raising equity capital or they can borrow funds, building up debt vis-à-vis foreigners. Foreign Direct Investment (FDI), for instance, is usually an equity type of finance but is less risky for the emerging country since economic risk is effectively transferred to the foreign purchaser and it tends to be stickier than other capital flows. Hence our focus on the basic balance (Current Account + FDI) as any shortfall on this measure usually leads to the accumulation of riskier external debt.

It is important to note again that all the identities above refer to net flows, so they include foreigners' purchases and sales of the emerging country's assets (considered as "inflows") as well as residents' purchases and sales of foreign assets (considered as "outflows"). While the former generally receives greater attention, the latter has gained in importance in recent years for some countries. In some cases, residents of an emerging country offset large inflows of foreign capital by buying assets abroad, either through the accumulation of foreign portfolio investments or the purchase of foreign currency reserves by the Central Bank.

Id (4) $\text{NIIP}_t = \text{NIIP}_{t-1} + \text{Current Account} + \text{Valuation changes}$

Over the years, the accumulation of inflows and outflows of capital can generate large stocks of foreign assets and liabilities owed to foreigners. The difference is the Net International Investment Position (NIIP), akin to the country's balance sheet vis-à-vis foreign residents. A country running persistent current account surpluses invests the proceeds into a growing stock of international assets and is considered a net creditor to the rest of the world. On the other hand, a country will be a net debtor if it runs sustained current account deficits that require borrowing from abroad for financing. The NIIP is also influenced by changes in the value of assets and liabilities.

Id (5.1) $\text{Current Account} = \text{Domestic Savings} - \text{Domestic Investment}$

Id (5.2) $\text{Current Account} = [\text{Domestic Private Savings} + \text{Domestic Public Savings}] - [\text{Domestic Private Investment} + \text{Domestic Public Investment}]$

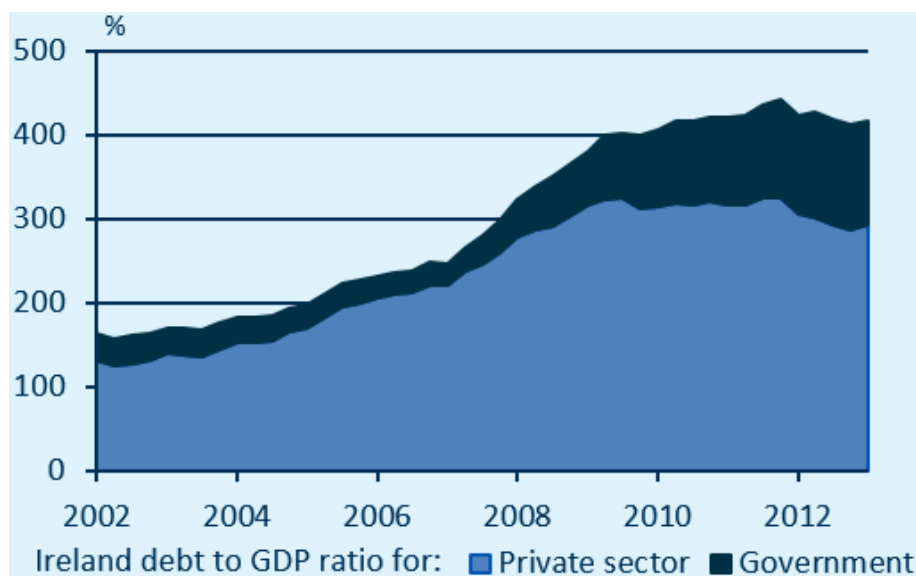
External balances also relate to domestic balances. The current account can be expressed as the difference between domestic savings and investment. A country with a current account deficit has a shortfall of domestic savings relative to its level of investment and so the difference must be financed from foreign sources. Developing countries and emerging markets have great investment needs given their infrastructure and human capital gaps, but in many cases their capital markets are not very deep and the pool of savings is limited. As a result, it is often optimal for them to run current account deficits. However, overly loose monetary policy, an overvalued exchange rate or misguided policy incentives often lead to overinvestment in unproductive parts of the economy and to the build-up of excess leverage in the household or corporate sector. A shortfall of public savings (a large fiscal deficit) will also spill over into an external deficit if private savings are not large enough to compensate.

2.2 Domestic private sector imbalances

Although domestic private sector imbalances often receive less coverage than measures of external imbalances or even public sector solvency, they are equally important when considering vulnerabilities to crises. When credit and house price growth has been too rapid, or there has been excessive investment in real estate, or non-financial corporations become too highly leveraged, one often finds that countries' current account balances have deteriorated and foreign capital inflows have contributed to the domestic boom (Caballero and Krisnamuthy, 1998; Calvo and Reinhart, 2000; Roubini, 2001; Jeanne and Zetelmayer 2002). Moreover, as Ireland and Spain showed during the financial crisis, solvency problems in the private sector quickly end up on the public sector balance sheet (see Chart 5). Again, the currency in which domestic liabilities are denominated in is an important determinant of crisis risk. When domestic liabilities are dollarised, currency depreciation has an amplifying effect on the deleveraging process (Calvo and Reinhart 2000; Allen et al, 2002). Residents find that not only are their domestic assets worth less but their debt and debt servicing costs

have increased in local currency terms. The ensuing insolvencies and recessions therefore tend to be deeper.

Chart 5: Private debt becomes public



Sources: Eurostat, Central Bank of Ireland, Standard Life Investments (as of Q12014)

2.3 Public sector insolvency

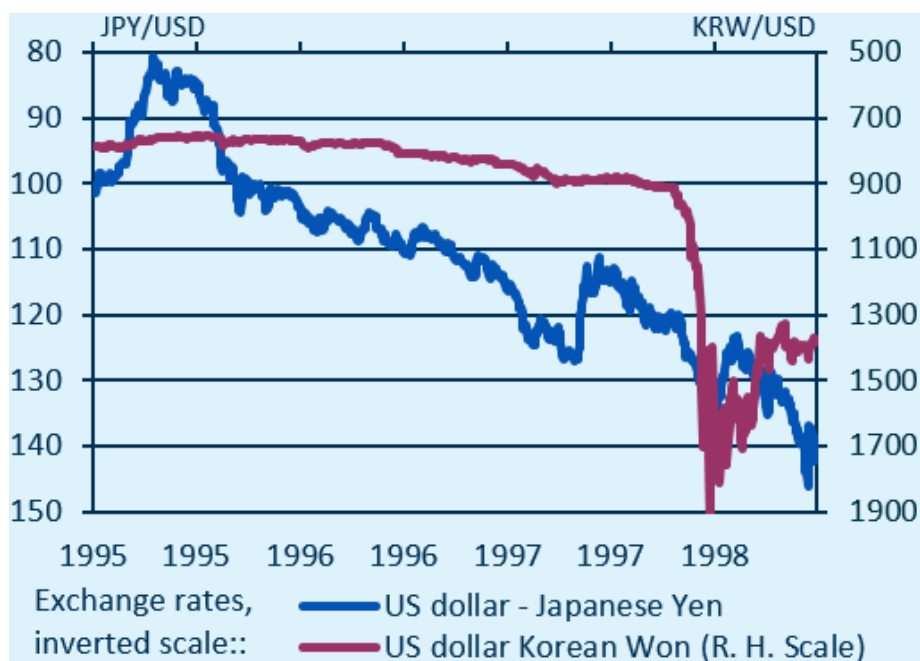
Another important source of crisis vulnerability in emerging markets is badly managed government finances. While the seeds of the Asian crisis did not originate in the public sector, many earlier crises did. Contrary to conventional wisdom, sovereign defaults have often occurred at relatively modest levels of public debt. For example, Mexico defaulted in 1982 despite having a public debt to GDP ratio of just 47% (Reinhart and Rogoff, 2009). There are a few reasons why the “safe” level of public sector debt can be quite low. For one, many governments choose to stop repaying debt well before they are unable to, either because they calculate that defaulting will leave them better off financially, or because the domestic political costs of maintaining market access are too high. Another reason is that market participants may stop rolling over debt as soon as they see the writing on the wall; that can simply be triggered by extrapolating high budget deficits or the implications of elevated inflation or non-performing loans into the future. As is the case for private-sector external debt, public sector borrowing in foreign currencies (otherwise known as original sin) can be especially toxic.

2.4 Exposure to foreign shocks

Often, crises in emerging markets are triggered by shocks emanating from abroad. One of these is sudden sharp increases in foreign interest rates that lead to rapid reversals in capital inflows. Last year the World Bank estimated that if global interest rates were to rise between

100 and 200 basis points, aggregate private sector capital inflows to emerging markets could decline by 80%, which would probably be enough to precipitate a crisis in some countries. We currently expect a much more gentle increase in interest rates but recognise that abrupt moves have happened in the past. Foreign currency shocks can also be important. For example, the more than 50% depreciation of the yen between mid-1995 and mid-1998 was highly destabilising for other Asian economies (see Chart 6). Then there is the foreign business cycle. Global downturns tend to depress export earnings and reveal previously unrecognised structural economic weaknesses (Frankel and Roubini, 2001). As the saying goes, you only find out who is swimming naked when the tide goes out. A shock to growth coming from the United States appears remote at present. However, a hard-landing in China would cause severe difficulties for those emerging markets that have become increasingly reliant on exports to the world's second largest economy.

Chart 6: Korea's loss of competitiveness



Source: Bloomberg (as of 30 June 1998)

2.5 Institutional weaknesses

Behind most historical examples of severe external and domestic imbalance in emerging markets lies a story of policy and institutional weaknesses that have allowed imbalances to flourish. Past crises have often been associated with currency pegs that contributed to significant exchange rate misalignments that made it more difficult for central banks to control domestic credit and inflation, and ultimately invited speculative attacks (Summers, 2000; Calvo and Reinhart, 2000; Allen et al, 2002). Haphazard fiscal policy frameworks also increase countries' vulnerability to crises as they often incentivise inefficient spending

growth, put pressure on central banks to monetise deficits and generally lower governments' credibility in foreign debt markets. Weak regulatory frameworks also make crises more likely. Strong private capital inflows are always difficult to manage but countries that do not ensure that they are appropriately intermediated are more likely to experience credit and investment booms, as well as unstably funded current account deficits. For example, in a recent survey, the IMF found that Asian countries that made effective use of macroprudential tools were more likely to avoid excessive house price growth.

In summary, variables measuring external and internal imbalances were the most successful predictors of which countries were caught up in the Asian crisis, though public sector imbalances were more prominent in earlier crises. Importantly, sectoral imbalances matter just as much as nationwide imbalances. Currency and maturity mismatches significantly increase a countries' vulnerability to a crisis, while crises usually occur when there is a significant change in the external environment. The precise triggers for a crisis differ for each economy as any systemic weakness will be exposed when the tide of investor sentiment goes out. Finally, contagion is an important feature of most crises and asset prices usually overshoot as investors worry about being last out of the market. The next section puts these conclusions into action as we develop our heat-map of crisis vulnerabilities.

3. A HEAT-MAP OF CRISIS VULNERABILITIES

Heat-maps are a graphical representation of data, whereby different colours are used to represent quantitative ranges for the variables of interest. They make complicated arrays of information easier to understand, and in our case make it much simpler to identify visually areas of economic and financial risk. Our heat-map includes 14 individual indicators drawn from the crisis literature for 23 key emerging markets, as well as a summary indicator of overall crisis vulnerability (see Chart 7). We make use of five different colours, with red symbolising an area of high risk and dark green symbolising low risk. The technical appendix contains more details about how we constructed our heat-map.

Chart 7: Heat map of emerging market countries' vulnerability to a crisis

	External				Domestic				Sovereign		China exposure		Policy Framework		Aggregate Risk
	Basic Balance (% GDP)	Short-term Liabilities (% GIR)	Net non-FDI Capital Flows (5y sum, % GDP)	Real Effective Exchange Rate (5y change, %)	Monetary Policy Gap	Credit % GDP (5y change)	House Price to Income (5y change %)	Corporate Debt / Equity (%)	Primary Balance (% GDP)	Average maturity of government debt (years)	Value-add exported to Chinese Final Demand (% GDP)	Commodity exports (% of total exports)	Fiscal Rule / Countercyclical	FX / Monetary	
Argentina	-0.6	163	-9		-11.9	3.0	-30	42	-0.9	12.5	1.1	68	N/Y	Crawl / BR Anchor	
Brazil	-0.8	178	-1	2	-0.5	13.7	85	77	1.9	7.0	1.3	65	Y/N	Managed Float / IT	
Chile	2.7	216	-11	2	-4.1	10.0	2	58	-0.6	9.8	4.7	86	Y/Y	Float / IT	
Colombia	-2.2	140	4	12	-4.6	7.7	22	23	0.7	7.4	0.9	83	Y/N	Managed Float / IT	
Mexico	0.4	304	8	6	-3.5	1.0	-2	59	-0.3	8.6	0.3	26	Y/Y	Float / IT	
Peru	-2.5	88	-13	8	-5.7	7.8	43	18	1.3	11.2	2.7	86	Y/N	Managed Float / IT	
Venezuela	5.4	270	-12	14	-10.8	3.8			-18.6	7.9	3.4	98	N/N	Peg / BR Anchor	
Czech	4.2	172	-1	-5	-0.9	3.9	2	43	-1.5	5.3	1.1	12	N/N	Managed Float / IT	
Egypt	3.2	16	7	2	-1.5	-12.7			-6.6	2.0	0.4	55	N/N	Crawl / Other	
Hungary	4.1	197	-22	-4	1.6	-18.2	-23	32	1.6	4.3	1.5	20	Y/N	Float / IT	
Israel	1.7	172	-26	9	-3.7	0.4	34	95	-0.3	5.6	1.0	8	Y/N	Float / IT	
Poland	-0.3	216	11	-3	-1.3	3.0	-2	39	-1.8	4.9	0.7	23	Y/N	Float / IT	
Romania	1.3	100	3	1	-1.7	-7.2	-61	7	-0.8	4.3	0.5	23	Y/N	Managed Float / IT	
Russia	4.3	24	-12	11	-6.2	6.6	-38	60	-0.8	7.7	1.7	86	Y/N	Managed Float / Other	
South Africa	-3.9	450	12	-1	-3.5	-10.3	-18	32	-1.2	11.2	2.0	55	N/Y	Float / IT	
Turkey	-3.2	166	23	-9	-4.9	27.3	-2	47	1.1	5.9	0.5	22	N/Y	Float / Discretion	
Ukraine	-9.8	436	6	-17	0.8	-13.0			-2.0	3.4	0.7	39	N/N	Peg / BR Anchor	
India	-0.1	90	10	-4	-5.3	4.0	-12	83	-2.6	9.0	1.0	35	N/N	Managed Float / Other	
Indonesia	-2.8	224	-2	1	-6.6	8.4	-20	66	-0.6	10.4	1.9	64	Y/N	Managed Float / IT	
Korea	3.2	203	-11	17	-2.2	-4.5	-23	42	0.2	6.5	4.2	15	N/Y	Float / IT	
Malaysia	6.7	189	-20	1	-6.1	11.0	22	39	-2.7	5.8	5.7	38	N/Y	Managed Float / Other	
Philippines	2.9	101	-10	12	-6.4	5.9	-20	50	2.4	10.1	2.0	17	N/N	Float / IT	
Thailand	6.9	108	-13	7	-3.5	27.6	-19	57	0.6	8.8	4.0	26	N/N	Managed Float / IT	

Source: Standard Life Investments (as of September 2014)

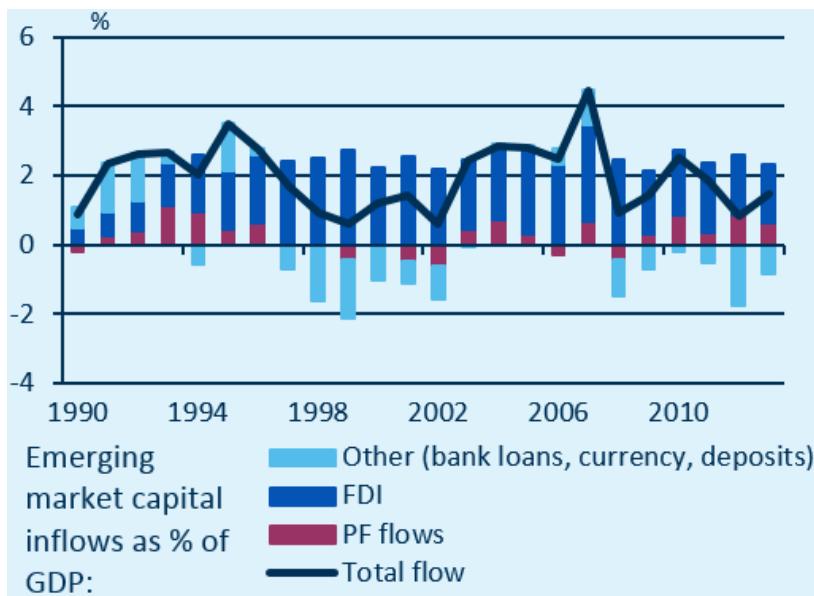
3.1 Indicators of external imbalances

We include four indicators of external vulnerabilities, which together have a 28% weight in the overall index. The current account balance is the standard measure of external risk because it flags the degree to which domestic economic activity is dependent on external financing. However, we prefer to use a country's **basic balance**, which adds foreign direct investment (FDI) flows to a country's current account balance, as our first indicator of external risk. We do this because the way that an external deficit is financed is just as important as its size. FDI tends to be much stickier than portfolio flows or bank lending and is therefore a more dependable source of long-term finance. Whereas FDI is a form of equity capital that absorbs some of the shocks faced by emerging markets, debt capital cannot play that role because fixed interest always comes due. Peru's experience during the financial crisis provides a good example of these benefits. When commodity prices dived at the end of 2008, repatriation of foreign companies' earnings and dividend payments contracted in line with lower metal prices, alleviating some of the pressures on the current account.

Over the last couple of decades, FDI has accounted for the largest portion of capital flowing to emerging economies (see Chart 8), but significant differences in the way deficits are financed exist across countries. On the basis of the basic balance, South Africa, Turkey and the Ukraine currently have high degrees of vulnerability. These economies have failed to attract long-term foreign investment to finance their large current account deficits and are therefore more vulnerable to shifts in global risk sentiment. Turkey in particular faced a current account deficit of 7.3% of GDP in 2013, though it has moderated somewhat in the

first half of 2014. On the other hand, current account deficits in countries such as Chile and Mexico are mostly a reflection of the long-term FDI flowing to these economies, which helps reduce their vulnerability to sudden stops. In Brazil, the external deficit has traditionally been entirely financed by FDI as well. However, over the last year, the current account deficit widened while FDI flows softened. Brazil's basic balance has been deteriorating as a result.

Chart 8: FDI accounts for most capital flows



Sources: IMF, Standard Life Investments (as of 2013)

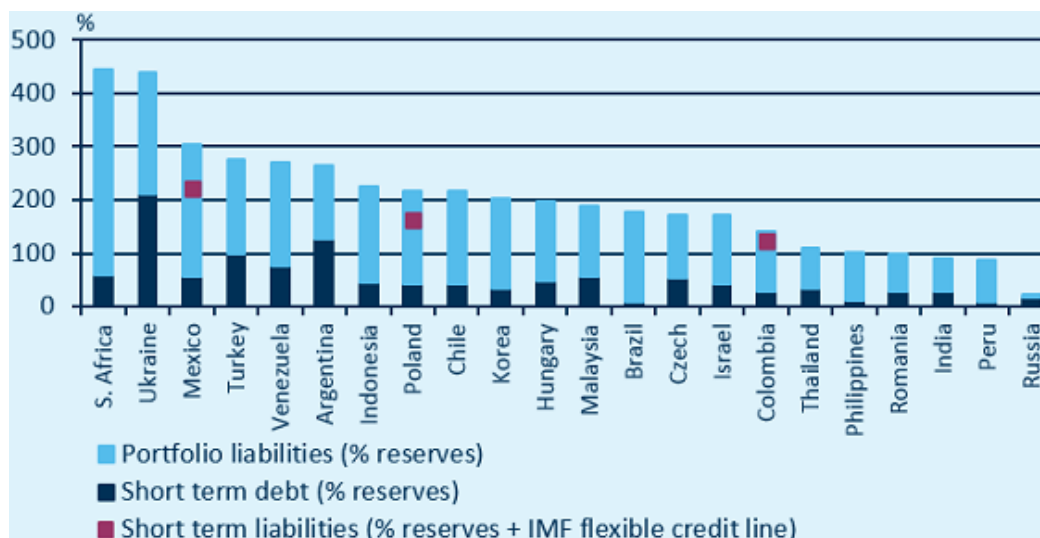
The most precarious way of financing current account deficits is through short-term capital inflows. Reliance on external debt with a maturity of less than twelve months generates significant roll-over risks as availability of credit depends on global risk appetite and liquidity conditions at the moment the debt matures. Likewise, portfolio equity flows can reverse quickly when risk sentiment changes. On the other side of the balance sheet, emerging market sovereigns have stocks of foreign exchange reserves held as liquid assets at the central bank. In times of stress, those can be deployed to accommodate outflows of footloose capital and help finance a smooth current account adjustment, reducing the impact on the real economy. The **ratio of short-term debt and portfolio liabilities to foreign exchange reserves** is therefore a good indicator of vulnerability to a sudden reversal of capital flows.

In contrast with the basic balance, a large number of the countries in our sample have high ratios of short-term liabilities to foreign reserves. Indeed, 10 have ratios above two, implying that running down reserves could, at most, absorb half of their short-term liabilities in the case of a sudden stop. Two of the countries with the greatest vulnerability on this measure are Venezuela and the Ukraine. They are also the only two countries in our

sample with currencies that have been formally pegged to the US dollar. Both have had to run down their reserves significantly in order to defend those pegs, with Venezuela ultimately forced to devalue and the Ukraine abandoning their peg altogether at the beginning of the year. South Africa and Turkey are also highly vulnerable by this measure, reinforcing the risks associated with their poor basic balance positions.

Mexico also has a high ratio of short-term liabilities to foreign reserves; though this partly reflects the large portfolio capital flows that have been attracted by the prospect of structural reforms to the energy sector as well as other key sectors of the economy. In addition, because the exchange rate is freely floating, the moral hazard created by pegs that invite speculators' betting on future devaluations is greatly reduced. Meanwhile, Mexico is one of only three countries that benefit from a standing IMF Flexible Credit Line (FCL) thanks to its sound macroeconomic policies. While this is not cash held at the central bank, it does mean that there is a large amount of foreign exchange available at short notice during times of stress. Adding the FCL to official reserves reduces Mexico's short-term liability to foreign reserves ratio by around 80 percentage points (ppts), though its potential vulnerability remains high (see Chart 9).

Chart 9: Foreign reserve buffers are low in a few countries

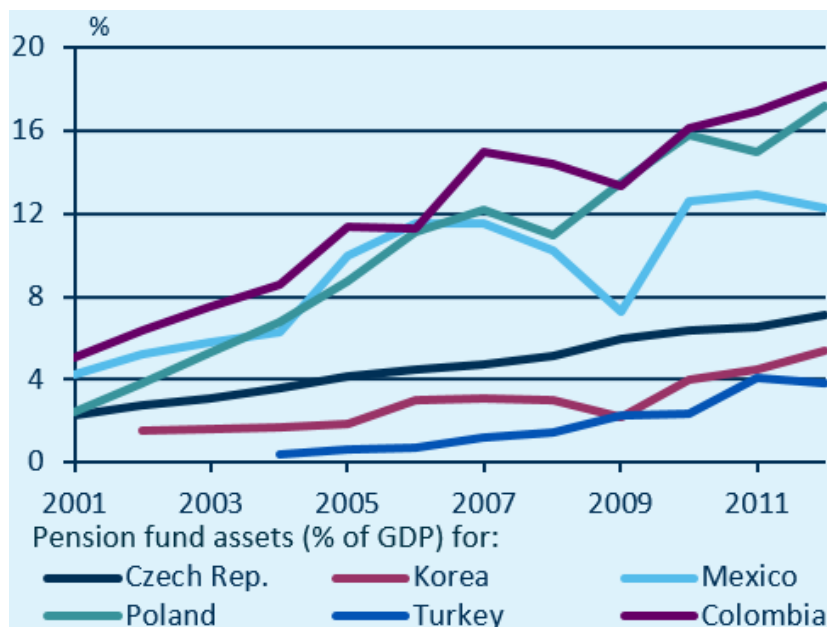


Sources: IMF, Standard Life Investments (as of 2013)

Short-term external liabilities and foreign exchange reserves are both stock variables. An alternative way to gauge external vulnerabilities is by measuring the extent of capital flows over a given period of time, as surges in such flows have usually preceded emerging market crises in the past. Traditionally, studies of emerging market vulnerabilities have focused only on capital inflows, which are foreigners' net investments in emerging markets. This approach has an important limitation though – it omits the accumulation of foreign assets by local investors. In the past this was justified by the fact that foreign flows dwarfed local

flows. However, the local investor base has grown rapidly in recent years and now plays an important stabilising role in many emerging markets (see Chart 10). Indeed, local investors often have a tendency to act in a counter-cyclical manner by repatriating offshore money when foreigners rush for the exit and local assets are seen as cheap. Our third measure of a country's external vulnerabilities then is their **total net non-FDI capital flows over the previous five years**. The main caveat to our choice is that measures of net capital flows may understate risk by hiding currency and maturity mismatches. Unfortunately such mismatches are not well measured at present.

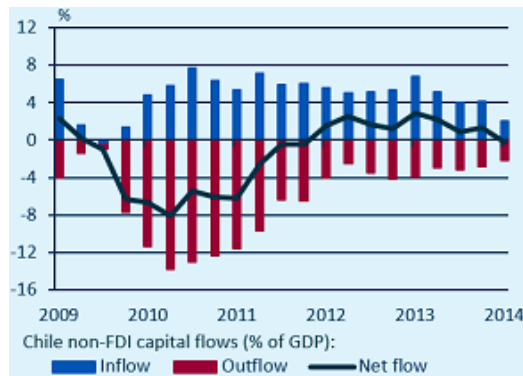
Chart 10: Pension fund assets growing



Sources: OECD, Standard Life Investments (as of 2012)

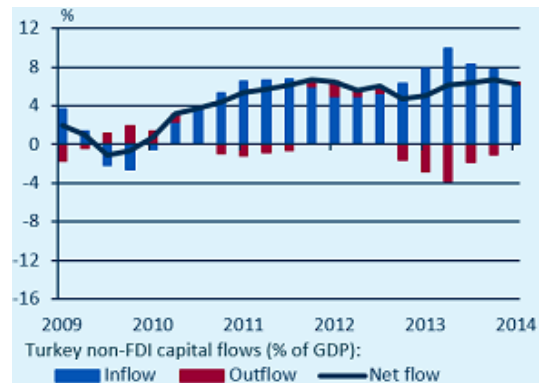
The advantage of our indicator is best illustrated by comparing Chile with Turkey (see Charts 11 and 12). Both economies have been large recipients of capital inflows in recent years. In Turkey, most of that capital was absorbed by domestic demand, boosting credit growth and household consumption, and widening the current account deficit in the process. Critically, the increase in foreign liabilities created by this capital surge was not matched by any increase in foreign assets, leading to a sharp deterioration of the country's balance sheet. In contrast, the central bank of Chile has been steadily building up foreign exchange reserves since the global financial crisis, while local pension funds and the country's sovereign wealth fund have accumulated significant foreign assets. This recycling of foreign capital entering the country has created a buffer that can be used if foreigners decide to repatriate their funds in the future.

Chart 11: Chile has recycled capital inflows



Sources: Datastream, Standard Life Investments
(as of Q1 2014)

Chart 12: Turkey has not



Sources: Datastream, Standard Life Invest
(as of Q1 2014)

Our final indicator of external vulnerabilities is the extent of any exchange rate overvaluation. Assigning a fair value to a country's exchange rate is, however, difficult, particularly in emerging markets where the appropriate level of the real exchange rate often changes over time. The simplest approach, and the one that we use, is to compute **the change in a country's real effective exchange rate over the past five years**. Our results are broadly consistent with other more complex measures of exchange rate misalignments, such as Fundamental Equilibrium Exchange Rate (FEER) models.

According to this measure, most emerging market currencies are not far from their fair value. The largest potential overvaluations are in Korea, Venezuela, the Philippines, Colombia and Russia. There are two important reasons for this fairly benign state of affairs. First, exchange rate pegs are now much less common than were in the past. This helps prevent currency misalignments from persisting for too long and makes it less likely that any misalignment will unwind in a disorderly manner. Secondly, many emerging market currencies depreciated significantly last year after the Federal Reserve announced its intention to taper its asset purchase programme (see Chart 13). For instance the Indonesian rupiah, which was overvalued at the beginning of last year, depreciated significantly in the summer of 2013 and now appears fairly priced on this measure.

Chart 13: Fed triggers EM currency weakness



Sources: Datastream, Standard Life Investments (as of June 2014)

3.2 Indicators of domestic imbalances

Like external imbalances, we have selected four indicators of domestic imbalances to include in our heat-map. Their equal weighting with external imbalances reflects the fact that their presence leaves the economy more susceptible to sudden changes in investor sentiment as well as shifts in domestic policies.

Inappropriate monetary policy settings are an important cause of domestic imbalances. Exceedingly loose policy encourages over-borrowing in the private sector as well as excessive consumer price inflation. A good way to assess if the monetary stance is appropriate is by benchmarking actual policy against the recommendations of a Taylor rule. These rules relate nominal policy interest rates to deviations of GDP from its potential and deviations of inflation from the central bank's target. When the economy is weak and inflation is low, the rule implies that the central bank should hold interest rates below their neutral level.

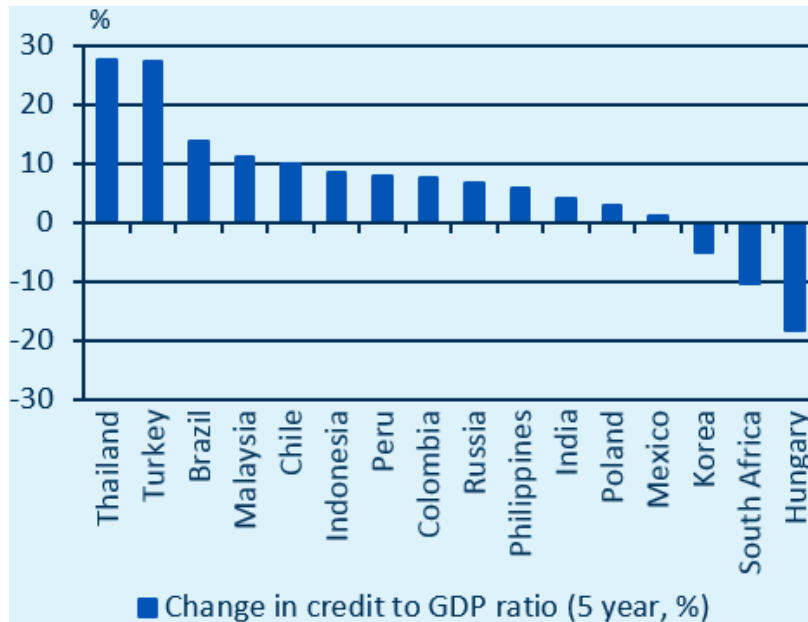
Although Taylor rules have been applied to the developed economies for a long time, the more recent adoption of formal inflation targets in most emerging markets makes it difficult to make historical comparisons. As a consequence, we use the difference between nominal interest rates and nominal GDP growth in each economy as our indicator of their **monetary policy gap**. According to this simple measure, monetary policy has been too loose in most

emerging markets in recent years, with the most extreme gaps found in Venezuela, Argentina, Russia, Indonesia and the Philippines.

While the precise reasons why policy rates have been held too low differ from country to country, there are some common themes. With the Fed undertaking quantitative easing and keeping its policy rate at the zero lower bound, many emerging market central banks have been wary of raising their own interest rates for fear of inviting more rapid capital inflows and a stronger exchange rate. Moreover, optimal interest rates may be lower than what is implied by the policy rule in countries like Malaysia and the Philippines that have high domestic savings and large external surpluses. Meanwhile, some central banks in emerging markets do not use interest rates as their main monetary policy tool but instead set quantitative targets for money supply and credit extension. It is therefore necessary to supplement our monetary gap indicator with more direct measures to assess whether apparently loose monetary policy has led to an actual build-up of leverage.

Excess private sector leverage has been a feature of most emerging market financial crisis. It is important to note though that it is the pace of credit growth that matters more than its level, as crises have often occurred in countries where credit penetration was still low. Indeed, in the past, virtually every country that has experienced an increase in their credit to GDP ratio by more than 30 percentage points over a five year period eventually endured a crisis, while many countries have suffered through crises after seeing their credit ratios increase by as little as 10 ppts (Chart 14). We therefore use the **five-year change in the ratio of private sector credit to GDP** as our indicator of whether there has been a dangerous build-up of leverage in that economy. However, because there is a secular upward trend in the credit ratio in most emerging markets, due to deepening capital markets and increased access, we have set our warning threshold at a change of more than 10 ppts of GDP.

Chart 14: Credit growth mostly restrained



Sources: Datastream, Standard Life Investments (as of Q2 2014)

On this measure, the emerging markets in our sample are in very different positions. In those Central and Eastern Europe countries that experienced credit booms in the lead-up to the Global Financial Crisis, the private sector is now deleveraging. However, in a few other select economies where policy has been too loose for too long or foreign capital has amplified domestic credit creation, the extent of the rise in the credit ratio has been worrying. Turkey and Thailand's increases have been only modestly less than 30ppts. Malaysia and Brazil have seen their credit ratios increase by more than 10ppts. In Turkey's case the build-up of leverage has been concentrated in the corporate sector while in the other countries it has taken place in the household sector.

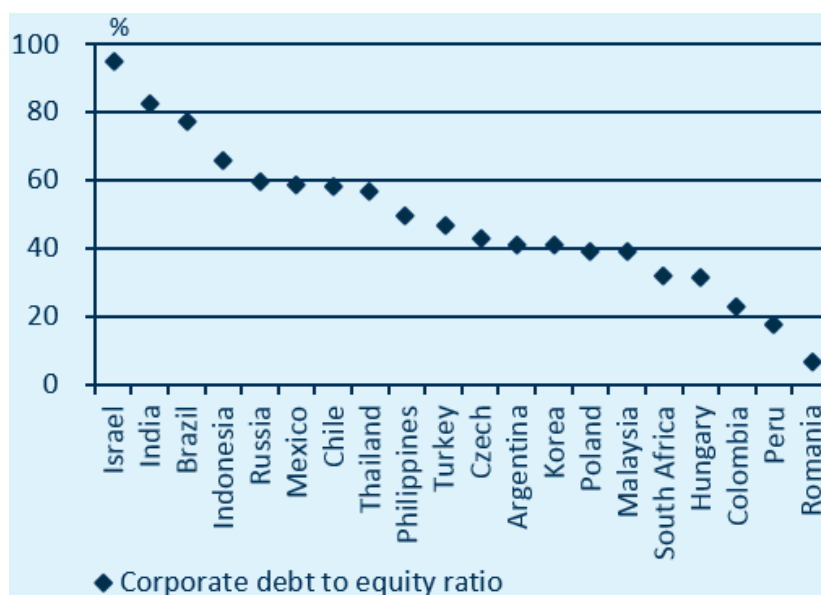
Our third indicator of domestic imbalances is the **five-year change in the house price to income ratio**. In countries where households have levered up since the financial crisis, it has usually been through increased mortgage debt in the context of house price inflation. House price corrections are very destabilising. Falling prices impair household balance sheets while simultaneously lowering the value of banks' collateral. That can in turn generate a wider credit crunch.

Comfortingly most housing markets in emerging countries do not appear overvalued in relation to household incomes. In fact, increases in nominal income per capita have outstripped real estate prices in most places over the past five years. The imposition of macro-prudential measures in a number of countries, such as limits on loan-to-value ratios or caps on debt-to-income by several policy authorities seem to have been successful in

fending off house price booms. It is telling that Malaysia is the main exception in Asia, as biting action to tighten mortgage lending was not taken there. On the other hand, it has been government policy to encourage home ownership by low-income and middle classes in Brazil and Peru, the two countries where the housing market now flags as most overvalued. While there is a genuine need for better quality affordable housing in those countries, overvalued house prices have left parts of the household sector very vulnerable to higher interest rates and tighter lending conditions. In Brazil, these dangers are accentuated by the aggressive increase in subsidised lending by state-owned banks.

In other places, it is companies that have taken advantage of low interest rates to leverage up their balance sheets. Our final indicator of domestic imbalances then is the **corporate debt-to-equity ratio**. Nowhere has corporate leverage reached levels comparable with Thailand or Korea prior to the Asian financial crisis, but firms in Brazil, Israel, Russia, India and Indonesia all have high debt-to-equity ratios (see Chart 15). The dangers of this type of debt accumulation are amplified by the fact that a meaningful share of this debt is raised externally in foreign currency. In contrast to emerging markets sovereigns, corporates have increasingly been tapping foreign bond markets as a source of finance. While aggregate private external debt remains relatively low in most countries, a concentration of debt in some sectors or large companies can pose important risks. Unfortunately, more refined data on corporate balance sheet vulnerabilities, including maturity mismatches, net foreign exchange positions and the use of hedging instruments are not available on a comparable basis for many countries. More effort needs to be made by domestic and international agencies to compile such data to allow policymakers and investors to make a more informed assessment of risks

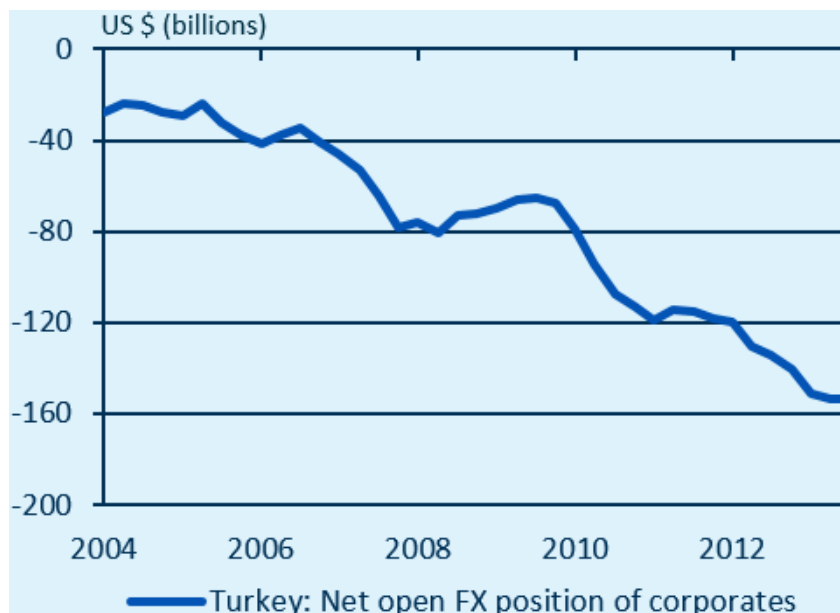
Chart 15: Corporate leverage



Sources: IMF, Goldman Sachs(as of April 2014)

Turkey is a good example of how important such information can be. Although aggregate corporate leverage is moderate, there has been a large increase in foreign currency denominated corporate debt in recent years. Turkish non-financial firms have been issuing bonds externally and they have also borrowed heavily in foreign currency from domestic banks. On the other hand, Turkish corporates traditionally keep large amounts of foreign currency assets abroad. This is still the case, but firms have recently been tapping into those foreign assets rather than accumulate more. As a result, their net open FX position has worsened, increasing their vulnerability to a large depreciation of the lira (see Chart 16).

Chart 16: Corporate Turkey has a currency mismatch



Sources: Datastream, Standard Life Investments (as of Q3 2013)

3.3 Indicators of public sector solvency

Although the health of sovereign balance sheets was not a useful predictor of which countries were most affected by the Asian crisis, unsustainable public debt dynamics were a key explainer of earlier crises such as in Latin America in the early 1980s. There are many factors that influence whether public debt is sustainable, including initial debt levels, the budget deficit, the level of interest rates, economic growth, the way that a country's debt is financed and its past history of repaying creditors. In our view, however, the most important measure is the gap between a country's current **primary fiscal balance** – that is the fiscal balance before debt servicing costs – and the primary balance that is necessary to achieve debt sustainability (see technical appendix).

The case of Brazil highlights why running a primary surplus is not necessarily a sufficient condition to achieve debt sustainability. There the combination of high domestic interest

rates, sluggish economic growth and an elevated level of public debt, implies that its primary surplus of 1.9% of GDP is insufficient to bring the level of public debt down from over 60% of GDP to a more sustainable level (see Chart 17). Contrast that with Peru, which has a smaller primary surplus (1% of GDP) but low interest rates and public debt as well as robust GDP growth.

Chart 17: Brazil must tighten policy



Source: Standard Life Investments (as of 2013)

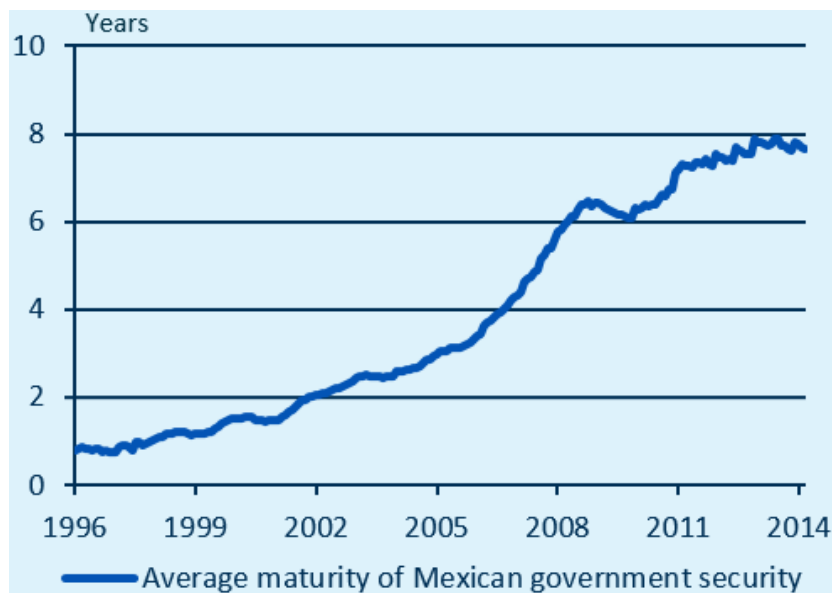
More generally, the emerging market complex is in relatively good fiscal shape. Fiscal indicators have improved in most countries over the past decade, helped by strong growth and good fiscal discipline, reinforced by the widespread use of fiscal rules. That said there are some important laggards. Venezuela, Egypt and Poland all need to tighten fiscal policy significantly to put their public finances on a more sustainable footing.

The **maturity of debt issued by governments** is an often overlooked, but critical measure of sovereign risk. It is our second indicator of public debt sustainability. The rationale is simple; the shorter the maturity profile, the greater refinancing risk is. Countries with short average debt maturities are more likely to have to undertake sharp fiscal contractions to meet repayments when capital markets become less willing to lend. Reliance on issuing debt at short maturities also exposes the government to more interest rate risk. This is the case in both Brazil and Turkey for instance, where their central banks have hiked interest rates over the past year, raising the marginal cost to the government of issuing new debt. That has quickly fed through into higher debt servicing costs in the budget.

The combination of low average debt maturity and high external holdings of public debt can be particularly toxic as it makes the sovereign much more exposed to sudden changes in

foreign interest rates. The Ukraine is especially exposed to this type of risk. In contrast, public debt in Peru, South Africa, Indonesia and the Philippines has a very long average maturity, allowing their debt management agencies more flexibility to look through the interest rate cycle. Accurate historical data are difficult to come by, but the maturity of government debt in emerging markets has generally increased since the late 1990s (see Chart 18). That, in parallel with the issuance of almost exclusively fixed interest securities to retire floating rate notes, and reduced reliance on foreign currency denominated debt, has significantly increased emerging sovereigns' resilience to shocks.

Chart 18: Extending public debt maturity

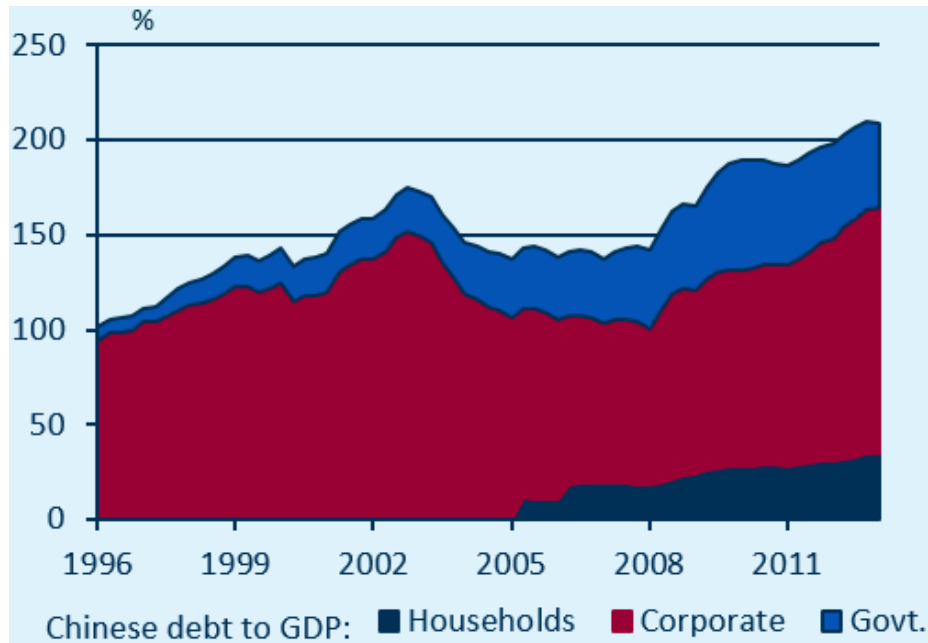


Source: Banco de Mexico (as of March 2014)

3.4 Exposure to a Chinese hard landing

The rise of China has been a boon for emerging markets, boosting demand for commodities in Latin America, as well as capital goods produced in Asia. While in the long-term China's ongoing development will further bolster demand, the disorderly unwinding of the country's domestic imbalances is probably the largest external risk to the emerging market complex. In the wake of the global financial crisis, the Chinese authorities enacted a massive monetary and fiscal stimulus programme. That in turn has led to an enormous leverage and investment bubble; with the private sector credit to GDP ratio increasing by 80ppts since 2008 and construction investment rising to some 15% of GDP (see Chart 19).

Chart 19: China is over-leveraged



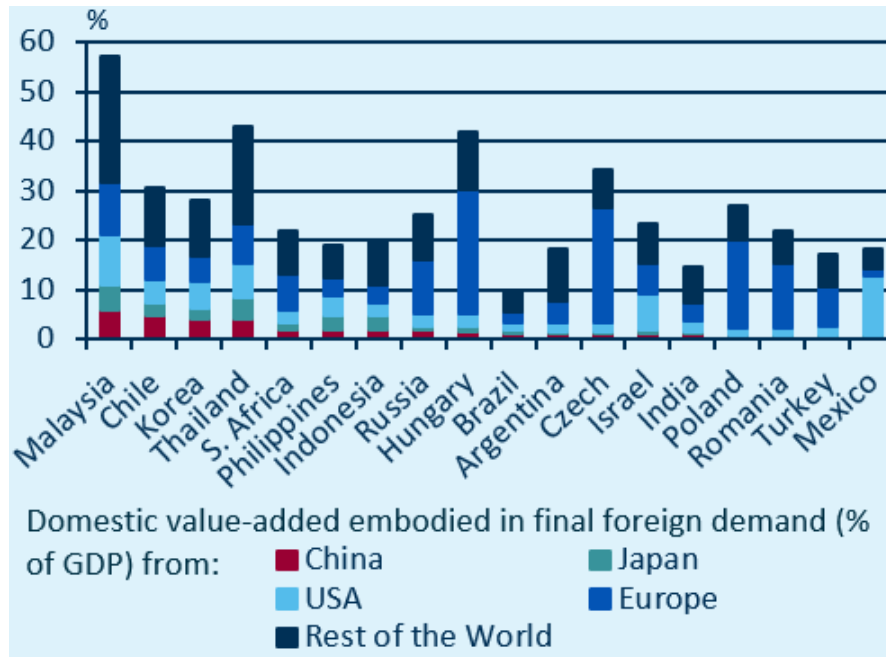
Source: Standard Chartered (as of Q4 2013)

The central government is aware of the fragilities that are associated with this type of growth but is having difficulty reconciling its growth targets with the need to reduce system leverage. As a consequence, economy-wide credit growth is still too rapid. There has also been a large increase in so-called shadow banking – credit allocation outside the normal regulated channels – that is proving even more difficult for the government to control. Although the government outlined an ambitious reform agenda late last year, progress has been very slow. Moreover, rebalancing the economy and reducing leverage after such a boom without generating a hard economic landing is a trick that no other emerging market has been able to pull off in the past. A near-term hard landing is not our central scenario but it is a major risk that needs to be taken into account when assessing economic and financial vulnerabilities in emerging markets.

A plunge in Chinese investment would significantly impact the demand for goods that are destined for Chinese domestic demand, but not so much the demand for those that are used for assembly and re-export to other countries. Fortunately the OECD provides a measure of the value-added that is embodied in goods produced in one country and that ends up being consumed or invested in another. Our first indicator of a country's exposure to China then is the **ratio of its value-added that is exported for Chinese final demand**. The measure highlights that, despite China's rise, most emerging markets are still more reliant on the final demand of developed markets (see Chart 20). Nevertheless, Korea, Malaysia and Thailand are all highly exposed to a hard landing according to this measure due to the

importance of their capital goods exports to China. Likewise, Chile’s copper exports would be badly affected by any downturn in China’s property market and infrastructure construction. Most countries in emerging Europe are relatively unexposed to Chinese domestic demand.

Chart 20: China exposure varies



Sources: OECD, Standard Life Investments (as of 2013)

Direct trade exposures are of course not the only source of China risk. A severe downturn in China would also put downward pressure on commodity prices. This type of shock would be transmitted through adverse terms-of-trade movements in those countries that are reliant on commodity exports even if they have modest direct trade flows with China. Our final indicator of a country’s potential exposure to a Chinese hard landing therefore is its commodity exports as a share of total exports. Latin American countries stand out in this respect, with Chile, Colombia, Peru and Venezuela all having commodity exports shares in excess of 80%. While Brazil’s share is also close to 70%, the risk there is somewhat mitigated by the relatively closed nature of the economy.

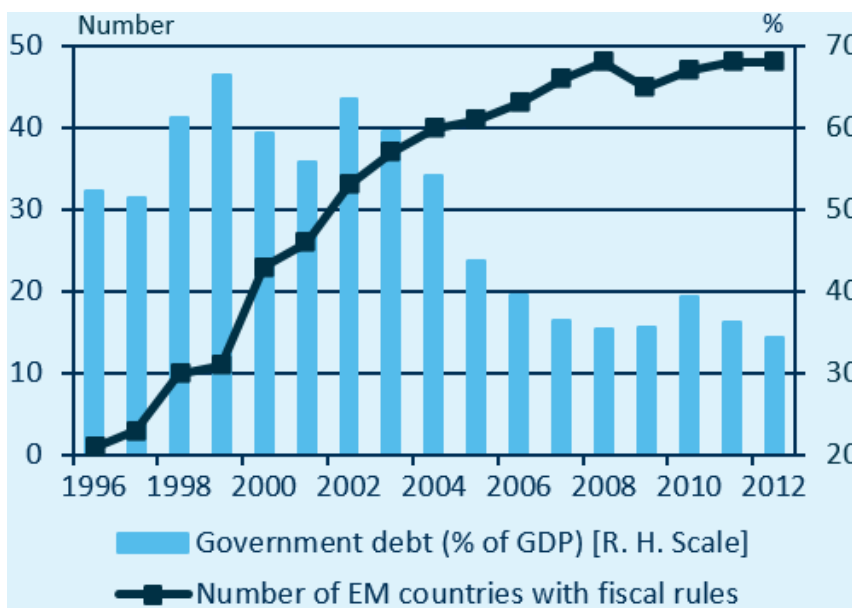
3.5 Indicators of good policies

The metrics reviewed so far provide a good snapshot of key macroeconomic and financial vulnerabilities. However, economic imbalances are often only symptoms of deeper institutional weaknesses. We have incorporated two indicators of the strengths of a country’s macroeconomic institutions into our heat-map. The first denotes whether a country has put

in place **formal fiscal rules and runs a counter-cyclical fiscal policy**. Fiscal rules are limits imposed on government expenditures, debt levels and fiscal deficits, usually with some legal backing and independent oversight. This helps ensure that fiscal discipline survives changes in government, thereby enhancing the credibility of fiscal policy.

Fiscal rules can also provide more scope for the use of counter-cyclical fiscal policy. This is important because it allows governments to lean against the business cycle – supporting growth during private sector downturns and moderating growth during booms. Historically, fiscal policy in emerging markets has been highly pro-cyclical. Spending growth accelerated when revenue growth was strong, leading to high inflation and overvalued exchange rates. This left no fiscal buffer when economic booms turned into economic busts, making both recessions and crises more likely.

Chart 21: Emerging markets with fiscal rules

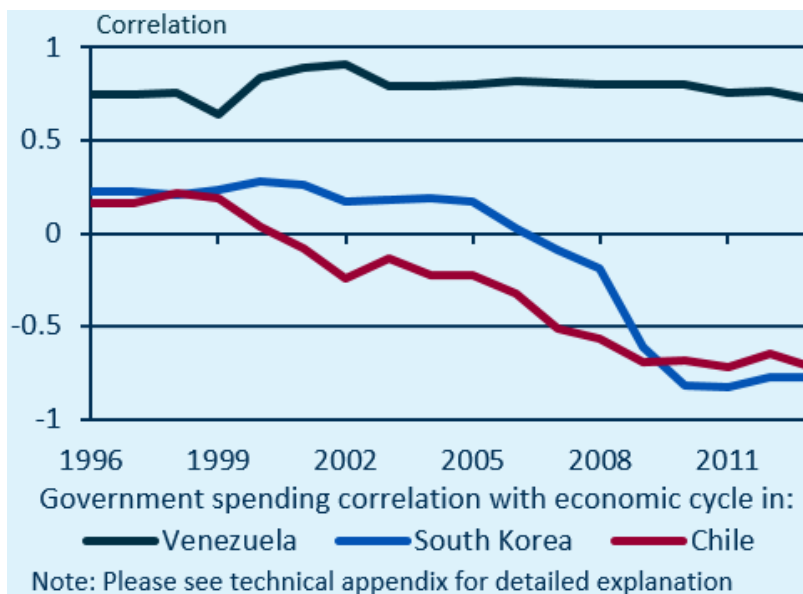


Sources: IMF, Standard Life Investments (as of 2012)

It is encouraging that many emerging market countries have adopted fiscal rules in recent years (see Chart 21). Chile is a good example of a country that has turned around its fiscal fortune in this way. In the early 2000s, the government set up a Sovereign Wealth Fund to save revenues from its copper exports that can only be tapped to meet long term liabilities. Accumulation rates in the fund are a function of GDP growth relative to potential and copper prices relative to their long term trend. This makes government saving highly counter-cyclical (see Chart 22). However, other countries have generally had less success in implementing counter-cyclical fiscal policies. Fiscal policy has remained pro-cyclical in Brazil, Russia and Indonesia despite the presence of fiscal rules, while Venezuela, Egypt, the

Ukraine, India, Thailand and the Philippines have the worst of both worlds – pro-cyclical fiscal policy and no fiscal rules.

Chart 22: Cyclical policy



Sources: Datastream, Standard Life Investments (as of Q3 2013)

A country's choice of **monetary policy and exchange rate regime** is also central to macroeconomic stability, and this forms the basis of our second indicator of countries' institutional strengths. In our assessment, the best policy mix in terms of minimising crisis risks involves targeting inflation within the context of a freely floating exchange rate. The worst mix involves making monetary policy subservient to a formal exchange rate peg. The two are closely related as the adoption of inflation targeting among emerging countries necessitates the abandonment of exchange rate pegs. The shift towards inflation targeting has been one of the biggest areas of institutional improvement in emerging markets since the Asian crisis, with 15 of the 23 countries in our sample currently targeting varying ranges of inflation.

Of course, some of the monetary authorities that claim to be inflation targeters continue to intervene in foreign exchange markets. Large and frequent intervention to defend a particular level of the exchange rate is similar in many ways to running a de facto currency peg. This generates two major types of risk. First, it creates incentives for banks and corporates to take on excessive amounts of debt denominated in foreign currency. For instance, despite its officially floating exchange rate, the Peruvian central bank continues to intervene heavily in foreign exchange markets, which has kept the banking system still highly dollarized. Second, exchange rate intervention often leads to overvaluation and to the deterioration of the current account. This exacerbates the likelihood of a large and sudden

adjustment in exchange rate, which in turn has a deleterious effect on domestic balance sheets.

This risk has been greatly reduced over the years with the adoption of floating exchange rate regimes. Only two countries in our sample, Venezuela and the Ukraine, are currently left with pegged exchange rates and even this is changing as the Ukraine's crisis has forced it to seek an IMF programme that required more exchange rate flexibility. The advantages of a floating exchange rate are particularly pronounced for commodity exporting economies. In Chile and South Africa the exchange rate has been allowed to adjust in the face of terms of trade shocks, thereby reducing any negative impacts on domestic employment. As mentioned earlier, a weaker exchange rate also serves to provide the signal necessary for local investors to bring back funds held abroad when foreign capital flows out, stabilizing the overall effect on the real economy.

3.6 Bringing it all together

Our aggregate indicator gives a good sense of where the greatest risks currently lie in emerging markets. It is no surprise that Venezuela flashes red on the heat map as it is an economy that has been mismanaged for years and is currently going through a crisis episode. The Ukraine ranked at the top of the risk scale earlier this year as well, but its score was reduced as the crisis unfolded and some external adjustment took place. The exchange rate experienced a sharp depreciation, monetary policy was tightened and the large current account deficit contracted as the economy entered a deep recession. Risks are still elevated though, especially as the fiscal balance will deteriorate materially on the back of reduced revenues, increased military expenditures and higher debt service costs due to the weaker currency. Fortunately those countries are of marginal importance to capital markets and the global economy. Their combined GDP, at 550bn USD, is only half the size of the Mexican economy or a quarter of that of Brazil. International debt securities of Venezuela, under 60bn USD, and of Ukraine, just over 30bn USD, account for only 3.5% of total emerging markets hard currency bonds and less than a percent of all international bonds outstanding. They are also marginal for equity market investors.

However, some pockets of risk have also emerged in a few of the largest emerging markets. Brazil's vulnerabilities have increased due to misguided government policy. Not only has the fiscal deficit deteriorated in recent years, but more importantly, the lending push from public banks has led to a rapid build-up of household and corporate leverage. In Turkey, it is private sector imbalances that pose the greatest risk. Banks are too dependent on foreign capital flows and companies have increased their foreign exchange liabilities. Monetary policy has also been too loose while the policy framework lacks transparency. Any further depreciation of the Turkish lira and increases in interest rates could have a large negative effect on corporate balance sheets. Some risks are also present in Malaysia and Thailand as their strong growth in recent years has coincided with very large increases in household

debt. Excess leverage was at the heart of their crises during the 1990s, though their external positions were much weaker then.

At the other end of the spectrum, a variety of economies, from Mexico and Chile to South Africa and the Czech Republic, present only a slight risk according to our indicators, although some would suffer from a collapse in commodity prices. A combination of improved policy frameworks, mostly balanced external accounts and modest domestic leverage has put these countries in a good position to weather potential shocks. India and Indonesia come out as having intermediate levels of risk in our analysis, but both carry less risk than Brazil and Turkey. That underlines the dangers of attaching simplistic labels such as the "Fragile Five" to countries with very different fundamentals.

The highest marks go to the Philippines, Korea, Romania and Hungary as they rank well on almost each of the five dimensions. The fact that Hungary scores so highly is an interesting finding. In some of the frameworks that attempt to capture vulnerabilities across emerging markets, Hungary fares badly because of its large stocks of government and external debt. This serves to highlight a key takeaway from our analysis: flows are just as important as stocks when assessing emerging market risk. For example, an economy that is rapidly leveraging up from low levels of credit penetration may be more vulnerable to a crisis than an economy going through a deleveraging process after years of excesses. That said stocks still matter; countries with high levels of private and public debt are particularly vulnerable to sudden, large changes in interest rates that dramatically increase debt servicing costs and increase the likelihood of default.

While our analysis sheds important light on the nature and extent of financial vulnerabilities in emerging markets, it should be noted that some aspects of risk are not well captured by our heat-map. For instance, Russia scores relatively well, in part because the risk of financial and trade sanctions associated with its intervention in the Ukraine is not reflected in the indicators. Similarly, some commentators argue that the increasing authoritarian tendencies of Prime Minister Erdogan are eroding the quality and independence of institutions in Turkey. This will have long-term consequences for economic growth and investment returns. Taken together, rising political risk and currency mismatches on corporate balance sheets signal that vulnerabilities in Turkey might be higher than reflected in our risk score. Argentina ranks relatively high as well, thanks in part to financial repression and its isolation from capital markets following its debt default in 2002 that kept the country from re-leveraging. However, the government was recently forced into another default by a legal court case in the US.

4. A COMPARISON WITH THE ASIAN CRISIS

The validity of our approach to assessing crisis vulnerabilities in emerging markets can be checked by comparing our current heat-map with one constructed for 1996, the year immediately before the Asian Crisis began (see Chart 23). Note that we have altered the construction of the heat-map in two important ways. First, we have dropped two indicators, for house prices and public debt maturity, due to insufficient data. Second, because China played a much less important role in the global economy, we have replaced the two indicators of exposure to China with a simple measure of a country's trade openness. If our method is useful, our indicators should have been providing clear and widespread warning signs before the crisis began.

Chart 23: A pre-Asian crisis heat-map

	External				Domestic			Sovereign	Global Links		Policy Framework		Aggregate Risk
	Basic Balance (% GDP)	Short-term Liabilities (% GfR)	Net non-FDI Capital Flows (5y sum, % GDP)	Real Effective Exchange Rate (5y change, %)	Monetary Policy Gap	Credit % GDP (5y change)	Corporate Debt / Equity (%)	Primary Balance (% GDP)	Trade Openness (Exports and Imports % of GDP)	Commodity exports (% of total exports)	Fiscal Rule / Countercyclical	FX / Monetary	
Argentina	-0.5	489	13	1	3.5	8.3	51	-0.3	18	70	N/N	Peg / FX Anchor	
Brazil	-1.4	128	9	11	900.5		28	-0.8	15	46	N/N	Crawl / FX Anchor	
Chile	0.8	90	20	21	-3.0	12.0	60	2.9	55	85	N/N	Managed Float / IT	
Colombia	-1.6	121	10	44	1.0	9.8	9	-1.7	29	70	N/N	Managed Float / Monetary Agg	
Mexico	1.7	310	5	-16	5.1	3.8	59	7.5	51	22	N/N	Managed Float / IT	
Peru	-0.3	30	30	6	-10.3	13.8	22	1.1	33	84	N/N	Crawl / Other	
Venezuela	14.8	197	-14	9	12.4	-10.3		7.9	58	88	N/N	Peg / FX Anchor	
Czech	-4.3	92	13	41	-14.1			-2.6	98	16	N/N	Managed Float / Other	
Hungary	3.3	42	13	15	-0.2	-9.7	16	3.2	97	30	N/N	Crawl / FX Anchor	
Israel	-4.2	170	22	3	-6.2	11.1	133	-3.0	61	9	Y/N	Crawl / Other	
Poland	0.8	85	11	35	-13.2	-2.3	-15	-0.3	46	26	N/N	Managed Float / IT	
Romania	-6.3	112	14	-18	-14.3			-1.9	62	23	N/N	Peg / FX Anchor	
Russia	3.2	150	-7	39	62.7		34	-0.3	48	74	N/N	Peg / FX Anchor	
South Africa	-1.3	1574	-2	-13	1.8	0.5	13	0.7	48	45	N/N	Free Float / Other	
Turkey	-0.8	205	1	-30	52.9	6.5	16	1.5	38	26	N/N	Peg / FX Anchor	
India	-1.1	126	10	-19	-2.7	-0.2	68	-2.2	24	28	N/N	Crawl / FX Anchor	
Indonesia	-0.7	226	12	5	1.5	7.5	85	3.4	47	49	Y/N	Crawl / FX Anchor	
Korea	-4.4	277	12	15	-1.5	27.0	100	-0.4	55	8	N/N	Crawl / FX Anchor	
Malaysia	8.6	154	19	8	-9.0	37.3		4.1	175	24	N/N	Crawl / FX Anchor	
Philippines	-2.5	170	41	29	1.1	28.2	40	4.7	79	16	N/N	Peg / FX Anchor	
Thailand	-7.1	364	48	1	-3.1	55.1	118	2.7	85	29	N/N	Peg / FX Anchor	

Source: Standard Life Investments (as of 1996)

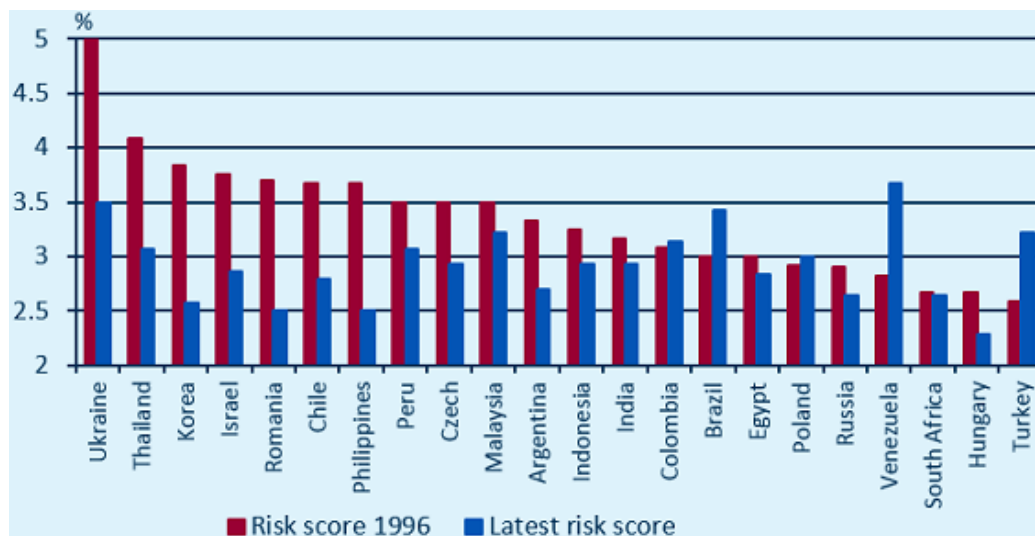
Comfortingly, that is indeed the case. Of the 21 countries in our 1996 sample, nine had very high levels of aggregate vulnerability before the crisis, while another five had moderate to high levels of vulnerability. Only four countries showed up as having low levels of risk and one of those, Mexico, had been through a crisis in 1994. That compares to today's position of only one country currently displaying the highest level of risk, with 10 countries appearing to have very low levels of risk (see Chart 24).

There are a number of reasons why systemic risk in emerging markets was much higher in 1996 than it is now. Most obviously, countries were in worse external shape. Large basic balance deficits were more widespread, reserve coverage was lower, a significant proportion of external debt was denominated in foreign currencies, non-FDI net capital inflows were

much stronger and most countries had overvalued exchange rates. In short, the majority of countries were heavily dependent on external finance and had few defences against a sudden change in foreign investor sentiment. On top of that, four of the Asian countries that experienced particularly painful crises had enormous credit bubbles. In Korea and Thailand's case the vulnerabilities were concentrated in the corporate sector, while Malaysia's problems related to housing.

The fact that so many countries had poor fundamentals also made the crisis worse. When Thailand and Indonesia's problems emerged towards the end of 1997, investors realised that there were very few "safe" emerging markets to seek refuge in. The breadth of risk, together with the lower level of liquidity in most markets fed contagion and panic. In the background of course were bad policy choices and poor macroeconomic institutions. Fiscal policy was universally pro-cyclical and fiscal rules non-existent, meaning that policy was feeding rather than leaning against domestic booms. Meanwhile, the majority of countries had either fixed or crawling exchange rate pegs. That incentivised excessive foreign currency lending and prevented monetary policy from addressing domestic imbalances.

Chart 24: Most countries less vulnerable than before the Asian crisis



Source: Standard Life Investments (as of 2013)

5. CONCLUSION

After a run of historically rapid improvement in living standards in the first decade of the millennium, emerging markets will face a more challenging economic and financial outlook over the next few years. Investor worries about deteriorating fundamentals have led emerging market assets to underperform over the past 18 months, and raised concerns in some quarters that a crisis may be just around the corner.

To assess how valid these concerns are we constructed a heat-map of external, domestic and institutional indicators that helped predict past emerging market crises. We found that while there are pockets of significant risk in countries such as the Ukraine and Venezuela, and that vulnerabilities have generally increased since the global financial crisis, the likelihood of a systemic emerging markets crisis that could threaten the global economy appears modest at present. It is certainly smaller than it was immediately before the Asian crisis. The majority of emerging market countries have upgraded their policy frameworks since that episode, which has contributed to more stable inflation, lower debt ratios and more balanced economic growth.

Nevertheless, there are some important dangers that investors should be aware of. China has become an important driver of growth in many emerging markets over the past decade and thus a hard landing there would be very disruptive. We are analysing separately some of the credit, debt, property and mal-investment issues facing China. A sharper than expected rise in US interest rates and disorderly unwinding of associated carry trades could also trigger a destabilising round of capital outflows from emerging markets. We would also caution that our heat-map of risk indicators was benchmarked on previous crises and suffers from some data limitations, raising the possibility that there are risks present that we are not capturing. The current situations facing Argentina and Russia are prime examples.

Although risks seem broadly contained at present, we also conclude that many emerging market governments could be doing more to shock-proof their economies. The most important measures include improving monetary and fiscal discipline, reducing reliance on short-term debt and portfolio capital inflows and undertaking broad-based structural reforms. Indeed, this helps explain why global investors are so focused on reform efforts across a range of emerging and indeed advanced economies, looking for measures which will raise the long-term growth rate, or make such economies less vulnerable to shocks. Prime Minister Modi's efforts in India are encouraging signs that one of the largest emerging economies is taking steps in this direction.

While we are not predicting a crisis, investors should be mindful of differentiating between countries when allocating capital to emerging markets. At a time when many investors are considering investing passively in a benchmark, our analysis emphasises the value, especially at this phase of the business cycle, in being much more focused in selecting particular countries, sectors or companies in order to steer away from the more vulnerable assets to future economic, financial or political shocks.

TECHNICAL APPENDIX

This appendix details how the heat-map was built and references data sources. Five different levels of risk were identified for each indicator, corresponding to the table's colour code: high risk (red), moderate risk (orange), neutral (grey), light risk (light green) and very light risk (dark green). The thresholds for the five risk levels were inspired by empirical findings identified in the literature and are detailed below. The heat-map will be updated on

a regular basis for the benefit of our fund manager teams.

Risk Thresholds

Chart 25: Calibrating the heat map

	Basic Balance (% GDP)	Short-term Liabilities (% Gross International Reserves)	Net non-FDI Capital Flows (5y sum, % GDP)	Real Effective Exchange Rate (5y change, %)	Monetary Policy Gap (%)	Credit % GDP (5Y change)	House Price to Income (5y change %)	Corporate Debt/Equity (%)	Gap between Primary Balance and Target (% GDP)	Average maturity of government debt (years)	Value-add exported to Chinese Demand (% GDP)	Commodity exports (% of total exports)	Fiscal Rule / Counterfactual	FX / Monetary Regime	Aggregate Risk
High risk	< -3.5	> 200	> 20	> 20	< -5	> 20	> 20	> 100	< -4	< 5	> 4	> 80	N/N	Peg / ER Anchor	> 3.5
Moderate risk	-3.5 / -1	100 / 200	10 - 20	5 / 20	-5 / -1	10 / 20	5 / 20	60 / 100	-4 / -1	5 / 6	3 / 4	60 / 80	Y / N	Crawl / ER or Other	3 / 3.5
Neutral	-1 / +1	80 / 100	5 - 10	5 / -5	-1 / 0	5 / 10	-5 / 5	40 / 60	-1 / 1	6 / 7	2 / 3	40 / 60		Managed Float / Other	2.8 / 3
Light risk	+1 / +3.5	50 / 80	0 - 5	-5 / -20	0 / 2	0 / 5	-5 / -10	20 / 40	1 / 4	7 / 10	1 / 2	20 / 40	N / Y	Managed Float / IT	2.5 / 2.8
Very light risk	> +3.5	< 50	< 0	< -20	> 2	< 0	< -10	< 20	> 4	> 10	< 1	< 20	Y / Y	Float / IT	< 2.5

Sources: Standard Life Investments (as of June 2014)

External balance variables

Basic Balance – The basic balance is the sum of the current account and FDI as a percent of GDP. Both current account and FDI are from national sources. Historical data for 1996 are from Oxford Economics.

Short-Term Liabilities to FX Reserves – We have constructed our Short-Term Liabilities indicator as the sum of short-term external debt and the stock of portfolio liabilities from international investment position data. While portfolio liabilities can be of long-term maturity, we consider it as a “short-term liability” since it can easily be sold by foreign investors unlike FDI for instance. Reserves are gross central bank reserves. Data are from national sources and International Financial Statistics (IFS). Historical data for 1996 on short-term external debt are from Oxford Economics and data on portfolio investment liabilities are from the External Wealth of Nations database compiled by Lane and Milesi-Ferretti.

Capital Flows – Net non-FDI total private capital flows are from Oxford Economics and IFS and are cumulated over five years.

Real Effective Exchange Rate – REER data series are from IFS and BIS.

Domestic balance variables

Monetary Policy Gap – The monetary gap is calculated as the difference between the three year average of nominal interest rates and the three year average nominal GDP growth. The short-term money market interest rate from IFS is used and nominal GDP growth comes from Oxford Economics and national sources.

Credit to GDP – Current data on credit are from national sources and historical data come from BIS for credit outstanding and Oxford Economics for GDP.

House Prices – House prices come from the BIS property price database and national sources. GDP per capita is used as a proxy for household income and comes from Oxford Economics. The house price indices and nominal GDP per capita are rebased to 100 in Q1 2009 and the change in the ratio of the two indicators is computed to Q4 2013.

Corporate Leverage – Corporate Debt to Equity ratio is from the IMF April 2014 Global Financial Stability Report and from Goldman Sachs research.

Public sector balance sheet variables

Primary Balance – The risk thresholds for the primary balance (PB) are set relative to the gap between the actual PB and the PB target necessary to meet a debt sustainability target within five years. The debt sustainability target is set at a debt level of 40% of GDP, which is often recognised as a conservative threshold for low to middle income countries, or a reduction in debt to GDP by 20%, whichever is greater. The PB target is calculated with the following equation, from the IMF Practical guide to public debt dynamics, January 2010:

$$p^* = \frac{\lambda}{(1+\lambda)^N - 1} ((1+\lambda)^N d_N^* - d_0)$$

With:

$$\lambda_t = \frac{i_t - \gamma_t}{1 + \gamma_t}$$

Where i_t is the average nominal interest rate on public debt at time t , γ_t is nominal GDP growth, p^* is the primary balance target, d_N^* is the debt target to be reached and d_0 is the initial debt to GDP level. N is the number of years to reach the debt target and is set at five. All data are from the IMF World Economic Outlook with some data from Oxford Economics for 1996.

Average Maturity of Debt – Data source is Bloomberg.

China exposure variables

Value-Add Exported to Chinese Final Demand – The data are sourced from the OECD-WTO TIVA database and are for 2009. For Colombia, Peru, Venezuela, Egypt and Ukraine, for which no data are available, we draw an approximation from the ratio of value-add embodied in exports to nominal exports from countries that export similar types of goods.

Commodity Exports – Commodity exports as a percent of total exports are from the World Bank Development Indicators.

Policy Framework

Fiscal Rule / Counter-cyclicality – The existence of fiscal rules is taken from the IMF Fiscal Rules Dataset (2012). The counter-cyclicality measure is calculated as the 10 year rolling correlation between the cyclical element of real public expenditures and the output gap. Both are identified with an HP filter. A negative correlation means that expenditures tend to increase when the output gap is negative, so fiscal policy works to smooth the cycle. The method draws on the approach used by Frankel, Vegh and Vuletin in On graduation from procyclicality, NBER, 2012. Data are from Oxford Economics.

FX / Monetary – The type of exchange rate and monetary regime is from the IMF De Facto Classification of Exchange Rate Regimes and Monetary Policy Framework. Risk thresholds are set as a function of exchange rate regime first and monetary framework second. The lower risk category is for floating exchange rates and inflation targeting (IT) frameworks (Chile, Mexico, Hungary, Poland, Israel, South Africa, Korea and the Philippines). A deviation on either one of the two dimensions increases risk by one notch. So managed floats with IT (Brazil, Colombia, Czech, Peru, Romania, Indonesia and Thailand) and free floats with somewhat discretionary policy objectives (Turkey) are reflected in the same category. Managed floats with no IT framework (India, Malaysia and Russia) are neutral. On the other hand, hard pegs (Venezuela and the Ukraine) embody the highest risk, while crawling pegs (Argentina and Egypt) are in the more moderate risk category.

Aggregate Risk

The aggregate risk is calculated as the simple average of each indicator's score. The scores rank from one to five, with a very light risk indicator given a score of one and a high risk indicator a five. We take the simple average to keep the methodology simple and intuitive rather than attempt to estimate an optimal weighting structure. With this procedure, external and domestic risk indicators are effectively given twice the weight of the other three dimensions. This is in keeping with our main findings from the literature, which highlight the importance of external and domestic imbalances at the onset of crises.

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Jeremy Lawson is Chief Economist and Nicolas Jaquier is Investment Director, Emerging Market Debt at [Standard Life Investments](#).