# How do global investors differentiate between sovereign risks? The new normal versus the old

Eli REMOLONA, Marlene AMSTAD and Jimmy SHEK
Bank for International Settlements

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**Abstract**

When global investors go into emerging markets or get out, how do they differentiate between economies? Has this behaviour changed since the crisis of 2008 to reflect a "new normal"? We consider these questions by focusing on sovereign risk as reflected in returns on credit default swaps (CDS) for 18 emerging markets and 10 developed countries. Tests for breaks in the time series of such returns suggest a new normal that ensued around October 2008 or soon afterwards. Dividing the sample into two periods and extracting common risk factors from CDS returns, we find in both periods a world in which one global factor drives much of the variation in returns. Surprisingly, in both the old and new normal, the way countries load on this factor depends not so much on macroeconomic fundamentals as on whether they are designated an emerging market. A second factor is also important, and the loadings on this factor suggest safe-haven behaviour. But it is in the way the different countries load on this factor that most sharply distinguishes the new normal from the old. Regression analysis shows that in the old normal the loadings on the safe-haven factor depend on the sovereign credit rating, while in the new normal they are related only to the emerging market designation, as in the case of the first factor.

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## 1. Introduction

During the "taper tantrums" of the summer of 2013, many emerging market countries saw their currencies depreciate sharply and the spreads on their sovereign bonds widen dramatically. This prompted market analysts to identify five of the worst hit economies as the "fragile five," attributing their vulnerability to economic fundamentals, particularly to current-account deficits.[1] Indeed when global investors decide to buy or sell emerging market bonds, how do they differentiate between the different economies? What economic fundamentals do they consider to be important? How representative was the taper tantrums of episodes involving emerging markets?

Much of the literature on investing in emerging markets has been about a tug-of-war between "push" and "pull" factors, with the relative strength of these factors deciding whether we see capital inflows or outflows. The push factors often relate to economic or financial developments in the global economy as a whole or in the advanced economies, notably the United States. The pull factors often relate to country-specific economic fundamentals in emerging markets. Fratzscher (2012) finds that global push factors drove capital flows in 2008 but country-specific pull factors drove such flows in 2009-2010. Forbes and Warnock (2012) identify unusually large capital inflows and outflows in a large sample of emerging markets. In explaining these flows, they find a global risk factor to be the most important variable and domestic country factors to be less important. In the specific case of the taper tantrums, Eichengreen and Gupta (2014) look at equity prices, exchange rates and foreign reserves and find that the differential impact on emerging markets is largely explained by the size of the domestic financial market. Avdjiev and Takats (2014) look at the same episode and find that the variability of cross-border bank lending flows across emerging markets was related to differences in the current account balance and the share of cross-border borrowing denominated in US dollars.

We consider the role of economic fundamentals in investment decisions by focusing on sovereign risk in emerging markets. But instead of looking at capital flows, we look at risk premia. The role of risk premia is important because they determine the

[1] The term "fragile five" refers to Brazil, India, Indonesia, Turkey and South Africa. It seems to have been first used by Lord (2013). Not to be outdone, another analyst proposed a grouping called the "Sorry Six," which would include Russia as the sixth country.

cost at which a country can raise funds abroad. Hence the premia represent *incipient* capital flows rather than *realized* flows. Kennedy and Palerm (2014) examine such premia by analysing emerging market bond (EMBI) spreads. They find that much of the decline in these spreads from 2002 to 2007 reflected improved fundamentals, but the sharp increase in these spreads in the 2008 crisis was due to risk aversion. Remolona, Scatigna and Wu (2008) choose to analyze sovereign CDS spreads rather than EMBI spreads, the CDS market being more liquid than the underlying bond markets. They find that country-specific fundamentals drive default probabilities, while global investors' risk aversion drives time variation in the risk premia. Longstaff, Pan, Pedersen and Singleton (2011, hereafter LPPS) also rely on sovereign CDS spreads and find "little evidence of any unique sovereign credit risk premium." The risk premia found in CDS spreads seem to be largely a compensation for bearing the risk of global factors.

This paper follows most closely the approach of LPPS by analysing returns on sovereign CDS contracts. We examine these returns for 18 emerging markets and 10 advanced countries. We look at 11 years of monthly data starting in January 2004. Statistical tests for breaks in the movements of CDS returns suggest a break at the time of the eruption of the global subprime crisis in October 2008, the start of what appears to be a "new normal." This leads us to consider two subperiods separately, the old normal before the outbreak of the crisis and the new normal afterwards. For each subperiod, we start by extracting principal components to uncover the structure of correlations in CDS returns. We then analyse the resulting factors by relating them to various global asset prices. Next we focus on the role of economic fundamentals by analysing the cross-sectional variation of the country-specific loadings on the global factors. We seek to explain the variation of those loadings in terms of such fundamentals as debt-to-GDP ratios, current-account balances, sovereign ratings, GDP growth and depth of the domestic bond market.

When it comes to the global factors, the results are consistent with much of the literature on sovereign spreads. The first factor alone explains over three-fifths of the variation in CDS returns in both the old normal and new normal. This factor is highly correlated with asset price movements in global equity and corporate bond markets, especially in the new normal. A second factor is also important, but it is less correlated than the first with asset price movements in other global financial markets.

When it comes to how the different countries load on these factors, however, we get surprising results. We find that that the most commonly cited economic fundamentals have little influence on the country-specific loadings on the first factor. Instead the single most important explanatory variable for the differences in loadings

is a dummy variable that identifies whether or not a country is an emerging market. In the case of the second factor, some countries load positively on it while others load negatively, suggesting that the factor is related to safe-haven behaviour. It is in the way these loadings have changed, however, that most sharply distinguishes the new normal from the old. In the old normal, these loadings on the second factor are explained by sovereign credit ratings and by little else. In the new normal, the loadings are explained only by the emerging markets designation, as in the case of the loadings on the first factor.

In Section 2, we explain how we go about identifying the emerging markets in our sample as opposed to advanced economies. We also characterize our CDS data and implement procedures for identifying breaks in the time series. In Section 3, we conduct factor analysis on CDS returns and analyse the behaviour of the resulting global risk factors. In Section 4, we analyse the country-specific loadings on the two most important global factors and interpret our results. In the last section, we draw conclusions about the new normal in global bond markets.

## 2. Data: Emerging markets, advanced economies and CDS spreads

### 2.1 Eighteen emerging markets, 10 advanced economies

It turns out that there is no consensus on which countries are "emerging markets." In general, the term refers to fast-growing developing countries. The original definition in the 1980s seems to have referred to developing countries in which portfolio equity investment presented opportunities for high returns. The term was later applied also to fixed-income investments. In this paper, we focus on bond markets but adopt a relatively broad country definition. Later in the analysis, we will test the robustness of this definition.

We include in our sample of emerging markets any country that meets one of the following criteria as of 2014:

a) It is in the IMF's list of emerging or developing economies;
b) It is in the World Bank's list of low and middle-income countries; or
c) It is a constituent of the emerging market bond index of Barclays, JP Morgan, Merrill Lynch or Markit;

However, we exclude so-called "frontier markets", countries in which the outstanding amount of public debt as of 2014 is less than USD10 billion and countries for which the sovereign credit rating falls below Ba for Moody's or below BB for Standard and Poor's as of 2014. To include such frontier markets would raise idiosyncratic issues

related to market illiquidity or other restrictions. We also exclude countries for which data on sovereign CDS contracts are not available for most of the sample period.

We end up with a sample of 18 emerging markets. As listed in Table 1, the sample includes five countries in Latin America, seven in Asia, three in Eastern Europe and three more in other parts of the world. The classification is broadly in line with the MSCI market classification. However, Hong Kong but not Korea is classified as a developed market by MSCI. India and Singapore do not make it to the sample because they lack actively traded sovereign CDS contracts for the more recent part of the sample.[2] An arbitrary element is apparent in the list. It includes Hong Kong, which has the same per capita income as the United States, and it includes South Korea, which has the same per capita income as the European Union.[3] We will test for the robustness of our results with respect to this classification of emerging markets.

For our sample of advanced economies, we choose countries based on the following criteria for data as of 2014:

a) Its currency is part of the SDR and its government bond market is at least USD1 trillion in size; or
b) Its currency has a share of at least 1% of global reserves based on COFER statistics; and

Note that the first criterion leads to the inclusion of any country in the euro area that has a government bond market that is at least USD1 trillion in size as of 2014. This leads to the inclusion of Germany, Italy and France but not Spain, Belgium and the Netherlands.

We end up with a sample of 10 advanced economies, which are also listed in Table 1.

### 2.2 The CDS market and returns across countries

An advantage of using CDS data rather than data on underlying bonds is that at least since 2004 the CDS market has become more liquid than the underlying bond markets. The disadvantage of CDS data is that they provide a shorter time series than the data on emerging market bonds.

[2] CDS data for India are available only up to August 2009 and for Singapore up to March 2012.

[3] Indeed our emerging markets sample includes seven OECD members: Chile, Mexico, South Korea, Czech Republic, Hungary, Poland and Turkey. All these countries are considered emerging markets in the MSCI market classification.

To buy a CDS contract is to buy protection against default by the reference borrower specified in the contract. The borrower may be a private firm or a government. In the event of default, the buyer of the contract would deliver to the seller the underlying bond, while the seller would in turn pay the buyer the par value of the bond.[4] In exchange for this protection, the buyer periodically pays the seller the CDS spread until either there is a default event or the contract matures. That spread is essentially an insurance premium. Most CDS contracts are denominated in US dollars. For these contracts, a buyer of protection who is also holding the underlying bond would typically expect a return on the combined positions close to that of a US Treasury security of the same duration. The seller of protection would expect a return close to that of a long position in the underlying bond and a short position in the US Treasury security.[5]

We obtain from Markit monthly data on five-year sovereign CDS spreads. We choose the five-year maturity, because this is the most liquid maturity segment of the CDS market. To allow tests for a "new normal" we prefer an early start date even though this might restrict the numbers of markets. Our sample covers the period from January 2004 to December 2014, giving us 132 observations for each country.[6] To avoid possible weekend and holiday effects, we choose CDS spreads available on the last Wednesday of each month. If that Wednesday happens to be a holiday, we go back to the previous trading day that is not a Monday or Friday.

Returns on CDS contracts are given by $r_{i,t+1} = s_{it} - d_t\left(s_{i,t+1} - s_{it}\right)$, where $r_{i,t+1}$ is the return realized at month $t$+1 for country $i$, $s_{it}$ is the swap spread at month $t$ and $d_t$ is the duration, with the variables consistently expressed in monthly terms. For purposes of analysis, however, it will suffice to focus only on the monthly changes in spreads, which will account for most of the variation in returns.

We summarize in Table 1 our data on CDS spreads and monthly changes in those spreads. The average spread for a given sovereign ranges from 19 basis points for the

[4] This assumes the CDS contract specifies physical delivery. A CDS contract may alternatively specify net cash settlement.

[5] Duffie (1999) explains such valuation by reference to risk-free rates. Similarly, Hull and White (2000) use approximate no-arbitrage arguments to establish the value of CDS contracts. Amato and Remolona (2005) show that corporate CDS spreads tend to be much wider than expected losses from default. For BBB/Baa-rated borrowers, the CDS spread would typically be four times the historical average of default losses. In the case of sovereign CDS contracts, Remolona, Scatigna and Wu (2007) decompose spreads into an expected default loss component and a risk premium component, with the latter turning out to be the bigger part.

[6] While CDS spread data are available going back to 2000, for some of the countries in our sample the contracts apparently started trading actively only in 2004.

United States to 232 basis points for Turkey. While the average monthly change tends to be close to zero, it is negative for six countries and positive for 22 countries. The annualized volatility based on these spread changes ranges from 22 basis points for the United States and 243 basis points for Russia. Wider spreads are associated with greater return volatility. Spreads and volatility tend to be of the same order of magnitude. In our sample, the average ratio of volatility to spread is 0.94. The average pair-wise correlation of spread changes is 0.61, suggesting a fairly high level of commonality in general.

## 3. Global factors in a "new normal"

### 3.1 Testing for a "new normal"

In many respects, the bankruptcy of Lehman Brothers in September 2008 was a watershed event. It was the start of the global subprime crisis. The question in this paper is whether the event led to a lasting change in the behaviour of investors in emerging markets.[7] Hence, we test the hypothesis of a "new normal." Do we find one or more break points in the data generation process across time? If we do, where do the breaks occur? Eleven years of monthly data are a relatively short sample to test rigorously for break points, especially in a time series of asset returns. Therefore, we apply the tests to different moments of the CDS series, namely the spreads, first differences and volatility of those first differences.

First, we apply Bai and Perron (1998, 2003) to test for the existence of breaks in the series for each sovereign.[8] We find no significant break in any of the times series of first differences, which represent our measure of returns. We do find at least one and up to three break points for 19 of the 28 spreads and 12 of the volatilities. These are reported in Table 2. While some of the markets exhibit more than one break in spreads or volatilities, October 2008 stands out as the most common break point across different sovereigns. Since break points for first differences are not found, we do not analyse them any further. We then turn to the Quandt-Andrews test, which imposes on each individual market the condition of a single break at an unknown

[7] In the April 2008 issue of the its *Global Financial Stability Report*, for example, the IMF assumes that only emerging markets are vulnerable to financial crises. To the extent that market participants shared this attitude, the onset of the global subprime crisis in advanced countries might have led to them to change this attitude.

[8] Wang and Moore (2012) test for a structural shift in September 2008 in sovereign CDS spreads of 38 developed and emerging countries by applying the likelihood test to a dummy variable, and they reject the null of no shift between the two periods. Tamakoshi and Hamori (2014) test for breaks in volatility by applying the Bai-Perron approach to the absolute values of the demeaned series. In the case of financial sector CDS indexes, they find no breaks.

date.[9] In 9 of the markets, the tests for spreads and volatilities place a break in October 2008 and in 2 of the markets in September 2008. Finally, we apply a Chow test, which imposes on all markets the same break of October 2008.[10] The Chow test confirms the break in October 2008, which would mark the dividing line between an old and new normal. Nonetheless, the data show that there was already a spike in CDS spreads in September 2008, albeit a small spike relative to the ones in October. Indeed the eight months of September 2008 to April 2009 saw extraordinarily wide CDS spreads, which suggest that they should be analysed separately.

In the analysis to follow, we divide our sample into two subperiods, the subperiod up to August 2008 to represent the "old normal" and the one since May 2009 to represent the "new normal". To ensure that our results do not unduly depend on just the height of the global financial crisis, we avoid the period of extraordinarily wide spreads between September 2008 and April 2009. This leaves us with 68 months of data in the old normal as well as in the new normal. We will analyse separately the behaviour of CDS returns during the unusual period of the crisis. We will also analyse separately the period of the taper tantrums although we will not exclude it from the new normal.

The summary statistics in Table 3 show the following interesting changes between the two subperiods:

a) The levels of CDS spreads rose from an average of 73 basis points in the old normal to 114 basis points in the new normal; the rise was most pronounced for emerging markets in Eastern Europe;

b) Across regions, only for Latin America did the average spread decline between the two subperiods; this is because there was a crisis in Brazil in 2002, and that was such a big event for the region that spreads for Brazil, Colombia and Peru remained elevated through the first two years of our sample;

c) The average volatility or the annualized standard deviation of the changes in spreads hardly changed, but it rose for significantly for emerging Asia, Eastern Europe and the advanced economies;

d) The average unconditional pairwise correlation rose somewhat, from 0.58 to 0.61, but it rose significantly for all regions except Eastern Europe; and

[9] The Quandt-Andrews test identifies the maxima of individual Chow F-statistics.

[10] A trimming percentage of 15% is employed. Since there are 124 observations in the sample, the trimming value implies that regimes are restricted to have at least 18 observations.

e) If these summary statistics do not differ all that much between the old normal and the new, they certainly stand out for the crisis in September 2008 to April 2009; the average spread during the crisis was more than three times that in the old normal and more than double that in the new normal; the average volatility during the crisis was close to five times what it was in the two other subperiods and correlations were generally higher than even those in the new normal.

### 3.2 Importance and behaviour of the global factors

Can a small number of global factors explain the variation in the changes in sovereign CDS spreads? To answer this question, we model the variance structure of these returns in terms of principal components, which are orthogonal linear combinations of the returns. We will interpret the principal components as global risk factors. Figure 1 summarizes our principal component results. The first pie chart at the top shows the results for CDS returns during January 2004 to August 2008, the period of the old normal. The second pie chart shows the results for returns during May 2009 to December 2014, the period of the new normal. The two pie charts at the bottom show the principal components during two relatively brief stress periods.

The dominance of the first factor is striking. In the old normal, this factor alone accounts for 63% of the common variation in returns. In the new normal, this factor captures 64% of the common variation, a slight increase.[11] For its part, the second global factor explains 13% in the old normal and 9% in the new normal. The two factors together account for 76% of the variation in the old normal and 73% in the new normal.

It is interesting to see what happens to this variance structure in times of market stress. Figure 1 also shows how much each of the factors explains during the crisis episode of September 2008 to April 2009 and during the taper tantrums of May 2013 to December 2013. In both stress episodes, the first two factors become more important, but especially the first one. In the crisis episode, the first factor alone

[11] In LPPS, the first factor explains only 47% of the variation. They extract the factor from monthly CDS returns for a sample of 26 emerging markets and no advanced economies, covering the period from October 2000 to May 2007. While our sample of emerging markets is roughly a subset of theirs, we also include 10 advanced economies. Their sample period does not include our new normal, and in fact it ends 13 months before the end of our old normal.

accounts for 73% of the variation in CDS returns. In the taper tantrums, this factor alone accounts for 71% of the variation.

### 3.3 Factor correlations with global asset prices

One possible interpretation of the global factors is that they represent the time-varying risk aversion of various classes of investors.[12] To get a sense of who these investors might be, we compute a time series for each of the common factors and examine their unconditional correlations with various global financial asset price variables. High correlations, negative or positive, could suggest markets that reflect correlated fundamentals. Such correlation in fundamentals, however, is not evident in the data at the monthly frequency. But the high correlations could also mean markets that share the same investors, whose risk appetites vary over time.

We consider global asset price variables that represent the US equity market, the global corporate credit markets, and the US Treasury market. These variables are specifically the following: (a) the change in VIX, which is a calculation of the implied volatility of the S&P 500 Index over the next 30 days; (b) the return on the S&P 500 index; (c) the change in the CDX.NA.IG index, which is an actively traded contract based on CDS contracts for 125 large investment-grade corporate borrowers in North America and emerging markets; (d) the change in the CDX.NA.HY index, which is an actively traded contract similar to that for the CDX.NA.IG Index except that is based on 100 non-investment grade borrowers; (e) the change in the iTraxx Europe index, which is an actively traded contract based on the 125 most actively traded CDS contracts for corporate borrowers in Europe; and (f) the change in the US Treasury 10-year yield. These correlations are reported in Table 5 for both the old normal and the new normal.

In terms of absolute values, the first factor is highly correlated with most of the global financial asset price variables, and the correlations in the new normal are higher than those in the old normal. The correlations are highest with the corporate credit spread variables, namely the iTraxx Europe index, the CDX.NA.IG index and the CDX.NA.HY index, but they are also high with the S&P 500 (in absolute value) and the VIX. Only with the US Treasury 10-year yield is the correlation low. These correlations suggest that the investors who drive the sovereign risk market are also investors who drive the US equity market and the global credit markets but not the US Treasury market. In the new normal, these global investors have evidently

[12] The large literature on the equity premium puzzle, starting with Mehra and Prescott (1985), serves to reject the consumption-based utility function with constant risk aversion. To describe decisions related to risk, Kahneman and Tversky (1979) propose prospect theory, in which risk aversion can quickly change over time because it depends on recent gains and losses.

become even more important in the various markets in which they have had a strong presence.

In terms of absolute values, the second factor is much less highly correlated with the global asset price variables than is the first. Unlike the correlations of the first factor, those of the second factor are lower in absolute value in the new normal than in the old normal.[13] These correlations suggest that the investors represented by the second factor have tended to focus on the sovereign risk market and have not dealt very much with the US equity market, global corporate credit markets or the US Treasury market. If these investors had been somewhat active in other global assets markets before, the decline in correlations in the new normal suggests that they now merely dabble in those markets.

## 4. The role of fundamentals: Analysing the factor loadings

The country-specific loadings help us interpret the factors. In this paper, these loadings measure the sensitivity of individual sovereign risk premia to given global risk factors. The countries perceived by investors as riskier should be those that load more on the factors. The question is, what does "riskier" mean? What economic fundamentals enter into the risk metrics that investors use for judging the different countries? In this analysis, we try to answer these questions by analysing the factor loadings of the 28 countries in our sample. We limit ourselves to the loadings on just the first two global factors, which between them explain about 76% of the variation of sovereign CDS returns in the old normal and 73% in the new normal.

### 4.1 The country-specific loadings

All the countries in our sample load positively on the first factor. This means it is this factor that tends to make sovereign spreads widen together and narrow together. Nonetheless the loadings vary considerably across countries, so that when spreads move together, they do so in different magnitudes. The loadings also change between the old normal and the new. We show these loadings in Figure 2, arranged from lowest to highest. In the old normal, the loadings were relatively low for Canada, New Zealand, Brazil, Peru and Indonesia and relatively high for Poland, Malaysia, China and South Africa. In the transition to the new normal, the largest changes are a

[13] Note, however, that by construction, the higher the correlations of the first factor, the lower correlations of the second are likely to be. This is because the two factors are derived to be orthogonal to each other.

decline in the loading for the United States and increases in the loadings for Canada, New Zealand, Brazil, the Philippines and Indonesia.

Countries load on the second factor quite differently from the way they load on the first. As shown in Figure 3, this time some countries load positively, others negatively. This means it is the second factor that tends to make movements in sovereign spreads less than perfectly correlated. A rise in the factor leads to wider sovereign spreads for some countries and narrower spreads for others. The opposite effects on spreads suggest a safe-haven effect. In the old normal, the developed countries are the safe havens in that they load negatively on the second factor, with the exception of Canada, which loads positively. In the transition to the new normal, the most pronounced changes are declines in the loadings for Canada, the United Kingdom, France and Turkey and increases in the loadings for Australia and Japan. In the resulting loadings, Australia and Japan are no longer safe havens but Canada is.

### 4.2 The usual economic fundamentals and two dummy variables

Can the variation in these loadings be explained by differences in economic fundamentals? We examine the relationship of the loadings to seven commonly cited fundamentals, each one measured as the average for the country in each subperiod. To this list, we add dummy variables for emerging markets and for Asian emerging markets, so that we have a total of seven variables. The sources of the data are given in the parentheses:

a) Ratio of government debt to GDP (Moody's);

b) Current-account balance (IMF World Economic Outlook);

c) Real GDP growth (IMF World Economic Outlook);

d) Size of the domestic bond market as a ratio to GDP (BIS statistics);

e) Sovereign credit rating (average of Fitch, Moody's and Standard and Poor's);

f) Dummy variable for whether the country is an emerging market; and

g) Dummy variable for whether the country is an emerging market in Asia.

The current-account balance is emphasized by Lord (2013) in identifying the "fragile five". The size of the bond market is similar to the domestic financial market variable highlighted by Eichengreen and Gupta (2014). The dummy variable for Asia is meant to capture the Asia factor found by LPPS.

The sovereign credit ratings are long-term foreign currency ratings from the three major international rating agencies, Fitch, Moody's and Standard and Poor's. In

computing the average rating, numerical values are assigned to the ratings, with an AAA/Aaa rating receiving a value of 20, an AA+/Aa1 a value of 19 and so on notch by notch.

### 4.3 Regression analysis

To determine what economic fundamentals enter into the risk metrics used by global investors, we rely on regression analysis. We regress four sets of country-specific loadings on the same set of fundamentals: (a) loadings on the first factor in the old normal; (b) loadings on the first factor in the new normal; (c) loadings on the second factor in the old normal; and (d) loadings on the second factor in the new normal. We also analyse separately loadings estimated from the just the height of the global crisis in September 2008 to April 2009 and loadings estimated from the taper tantrums of May 2013 to December 2013.

In each case, we run the regressions in two ways. First, we run the full regression, in which we include all seven fundamental variables, including the dummy variables for emerging markets and Asian emerging markets. Second, we run a stepwise regression, because of the possibility of multicollinearity. We use the forward method as described by Derksen and Kesleman (1992), with a p-value of 0.10 as the stopping criterion. The results are not sensitive to the forward method, because we get the same results with the backward method.[14] If the stepwise procedure results in a significant variable with the wrong sign, we exclude that variable and run the procedure again.

### 4.4 What explains the loadings on the first factor?

The regressions of the loadings on the first factor show that the usual fundamentals have little influence on how investors differentiate between sovereign risks. The t-statistics for these regressions are reported in Table 6. In the old normal, the full regression shows a statistically significant coefficient for the sovereign credit rating but the coefficient has the wrong sign, because it suggests that the more highly rated countries load more highly on the factor. The regression also shows a significant coefficient for the Asia dummy variable, which is consistent with LPPS. The stepwise regression, however, changes the picture. Both the Akaike Information Criterion and the Schwarz criterion suggest that this regression is better specified than the full regression. In the stepwise regression, it is the market depth variable and the dummy variable for emerging markets that are significant. Countries with larger bond markets and emerging markets tend to load more on the first factor.

[14] Nonetheless, statistical inference in this case requires extra care, because the resulting p-values or standard errors do not account for the selection process.

The regressions for the new normal show an even more striking result. As shown in Table 6, the full regression shows significance for none of the variables. The stepwise regression, however, shows significance only for the emerging markets dummy variable. The market depth variable is no longer significant. Again, the Akaike and Schwarz criteria favour the specification of the stepwise regression.

The lack of influence of the usual fundamentals in the above results does not seem to stem from a "flavour of the month" effect, in which some fundamentals are considered important in one period and other fundamentals in the next period. When we analyse the loadings on the first factor for just the height of the crisis in September 2008 to April 2009 or the loadings for just the taper tantrums of May 2013 to December 2013, we get the same results: only the emerging markets dummy variable is significant.[15]

The above results suggest that the investors driving movements in sovereign spreads are those that follow index tracking. All that matters to them is whether the country is part of their emerging markets benchmark. They seem to care little about fundamentals beyond that.

### 4.5 What explains the loadings on the second factor?

The regression results suggest that it is in the way countries load on the safe-haven factor that most sharply distinguishes the new normal from the old. The t-statistics for these regressions are reported in Table 7.

In the old normal, the full regression shows only the sovereign credit rating to be a significant variable, and this time the coefficient has the expected negative sign. The stepwise regression confirms this. Countries with higher sovereign credit ratings load less highly on the first factor.

The results for the new normal show a change in the way investors perceive risk. Here the full regression shows only GDP growth to be a significant variable. However, the stepwise regression shows a different result. This time only the emerging markets dummy variable is significant. Emerging markets load more highly than developed economies on the safe-haven factor. Indeed, as shown in Figure 3, the loadings have opposite signs.

The loadings from the stress periods, however, behave differently. In the crisis period of September 2008 to April 2009, the stepwise regression shows three variables to be

[15] To check the robustness of our emerging markets definition, we redefine the dummy variable to exclude Hong Kong and South Korea. The dummy variable loses significance in the stepwise regression for the old normal, but remains significant in the new normal and in the two stress episodes.

significant: the sovereign credit rating, the market depth variable and the Asia dummy variable. The emerging markets dummy variable is no longer significant. In the taper tantrums of May 2013 to December 2013, the stepwise regression shows the sovereign credit rating and emerging market dummy variable to be significant but not the Asia dummy variable.

## 5. Conclusion

While much of the literature on investing in emerging markets paints the picture of a tug-of-war between push and pull factors, the picture that comes out of our analysis is one of a division of labour between global factors and country-specific factors. The global factors drive what happens over time, while the country-specific variables drive what happens across countries. In our analysis, the movements in global factors determine whether CDS spreads rise or fall over time. The extent to which these spreads rise or fall depends on the country, albeit on a feature of the country that has a surprising lack of granularity, as explained below. In general, this is a similar picture to that painted by Eichengreen and Gupta (2014) and by Avdjiev and Takats (2014), although they look only at the taper tantrum episode. Eichengreen and Gupta find that equity prices, exchange rates and foreign reserves tended to move together across countries but the magnitudes of the movements depended on the size of the domestic financial market. Avdjiev and Takats find that cross-border lending flows slowed down for emerging markets in general but the variability of the slowdown depended on country-specific variables.

We focus on the first two factors of a principal components transformation of sovereign CDS returns. These two factors turn out to be quite different. The first one is the more important one in terms of accounting for the variation of returns. It is also highly correlated with global equity markets and global credit markets, and the correlations rise even higher in the new normal. The different countries all load positively on this factor, so that it makes all sovereign spreads widen together or narrow together. The factor seems to represent the risk appetites of investors who not only have the greatest influence on sovereign spreads but who also influence other global markets.

The second factor is only weakly correlated with other markets, and its correlations decline further in the new normal. Some countries load positively on it, others negatively, so that it looks like a safe-haven factor that makes sovereign spreads move in opposite directions. The factor seems to represent the risk appetites of relatively

conservative investors who focus largely on sovereign debt and who rush into safe havens and get out of other debt when they lose their appetites for risk.

The most surprising results of our analysis have to do with the lack of role a role for economic fundamentals, and this is especially the case in the new normal. We find that the single most important "fundamental" reflected in the various factor loadings is simply whether the country has the designation of "emerging market". There seems to be no "fragile five"; there are only emerging markets. While "emerging markets" may serve to summarize many relevant features of sovereign borrowers, it is a designation that lacks the kind of granularity we would have expected for a fundamental on which risk assessments are based.

Nonetheless, this lack of a significant role for the usual macroeconomic fundamentals is not so different from the results of LPPS, who find "little evidence of any unique sovereign credit risk premium" and conclude that the risk premia found in CDS spreads are largely a compensation for bearing the risk of global factors. While Ang and Longstaff (2013) analyze sovereign risk in Eurozone countries and U.S. states rather than in emerging markets, their results are also consistent with ours: "… systemic sovereign risk has its roots in financial markets rather than macroeconomic fundamentals." Our results are also not so different from that of Eichengreen and Gupta, who identify the size of the domestic financial market as the most important fundamental.

The importance of the "emerging markets" designation in the new normal suggests that index tracking behaviour by investors has become a powerful force in global bond markets. Haldane (2014) has argued that in the world of international finance, the global subprime crisis and the regulations that followed made asset managers more important than banks. The world's largest asset managers – Blackrock, Allianz, Vanguard, State Street and Fidelity – individually manage over USD2 trillion in assets. Miyajima and Shim (2014) show that even actively managed emerging market bond funds follow their benchmarks closely. For the most part, when they invest in emerging markets, instead of picking and choosing based on country-specific fundamentals, they appear to simply replicate emerging market benchmark portfolios, the constituents of which change slowly over time.

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Table 1: Summary statistics for sovereign CDS spreads

| | Average CDS spreads | Average change in spread | Average volatility (annualized) | Average pairwise correlations |
|---|---|---|---|---|
| Latin America | | | | |
| Brazil | 200.6 | –1.56 | 163.8 | 0.53 |
| Chile | 69.8 | 0.32 | 70.6 | 0.69 |
| Colombia | 183.4 | –2.22 | 138.1 | 0.62 |
| Mexico | 116.3 | –0.13 | 107.5 | 0.72 |
| Peru | 166.4 | –1.35 | 141.4 | 0.59 |
| Emerging Asia | | | | |
| China | 68.8 | 0.44 | 66.1 | 0.71 |
| Hong Kong SAR | 43.2 | 0.18 | 30.0 | 0.57 |
| Indonesia | 228.2 | –1.26 | 233.4 | 0.63 |
| Korea | 88.7 | 0.05 | 160.3 | 0.66 |
| Malaysia | 83.0 | 0.53 | 88.2 | 0.70 |
| Philippines | 217.6 | –2.64 | 172.3 | 0.62 |
| Thailand | 98.0 | 0.54 | 92.3 | 0.69 |
| Central Eastern Europe | | | | |
| Czech Republic | 60.8 | 0.25 | 74.8 | 0.71 |
| Hungary | 205.4 | 1.13 | 153.1 | 0.65 |
| Poland | 92.6 | 0.22 | 94.2 | 0.70 |
| Other emerging markets | | | | |
| Russia | 184.5 | 2.06 | 242.6 | 0.66 |
| South Africa | 142.5 | 0.62 | 117.2 | 0.71 |
| Turkey | 232.1 | –1.04 | 165.3 | 0.61 |
| Advanced economies | | | | |
| Australia | 34.6 | 0.24 | 36.2 | 0.65 |
| Canada | 26.6 | 0.52 | 34.5 | 0.31 |
| France | 49.0 | 0.33 | 43.5 | 0.47 |
| Germany | 26.6 | 0.09 | 29.6 | 0.55 |
| Italy | 131.1 | 0.98 | 107.9 | 0.45 |
| Japan | 44.2 | 0.44 | 37.6 | 0.58 |
| New Zealand | 42.8 | 0.21 | 47.1 | 0.68 |
| Sweden | 25.3 | 0.08 | 41.8 | 0.55 |
| United Kingdom | 44.1 | 0.18 | 38.7 | 0.59 |
| United States | 18.9 | 0.10 | 22.2 | 0.43 |
| *Average for whole sample* | *104.5* | *-0.03* | *98.2* | *0.61* |

Sources: Markit; authors' calculations.

Table 2: Tests for structural breaks in CDS spreads and volatility

| | Bai-Perron test | | | | | Quandt-Andrews test for break at unknown date[1] | | | Chow test break in2008-10[2] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Spread | | | Volatility | | Break | Spread | Volatility | Spread | Volatility |
| Brazil | | | | | | | | | 12.85*** | |
| Chile | 2008-09 | 2010-03 | 2011-09 | 2009-08 | | 2008-09 | 57.08*** | | 115.40*** | |
| Colombia | | | | 2009-06 | | 2009-06 | | 2.26** | 11.07*** | |
| Mexico | 2008-09 | 2010-02 | | | | | | | 43.61*** | 2.73* |
| Peru | | | | | | | | | 2.93* | |
| China | | | | | | | | | 137.42*** | 4.20** |
| Hong Kong SAR | | | | | | | | | 164.17*** | 4.08** |
| Indonesia | 2009-07 | | | | | | | | | |
| Korea | 2009-11 | | | | | | | | 57.04*** | |
| Malaysia | 2009-07 | 2011-08 | | | | | | | 81.89*** | 3.33* |
| Philippines | 2009-07 | | | | | | | | 24.34*** | |
| Thailand | | | | | | | | | 111.90*** | 3.32* |
| Czech Republic | 2008-10 | 2010-03 | 2011-08 | | | 2008-10 | 112.79*** | | 234.28*** | 6.32** |
| Hungary | 2008-10 | | | 2009-08 | | 2008-10 | 197.74*** | 3.39*** | 404.25*** | 11.34*** |
| Poland | 2008-10 | | | 2009-09 | | 2008-10 | 123.79*** | 2.83** | 256.34*** | 10.07*** |
| Russia | 2008-09 | 2010-02 | | | | 2008-09 | 12.54*** | | 30.35*** | |
| South Africa | 2009-07 | | | | | | | | 71.06*** | |
| Turkey | | | | | | | | | | |
| Australia | 2008-10 | 2010-03 | 2011-08 | 2009-08 | | 2008-10 | 133.44*** | | 275.64*** | 9.37*** |
| Canada | 2009-01 | 2010-06 | | | | 2009-01 | 178.28*** | | 274.24*** | |
| France | 2008-10 | 2010-03 | 2011-08 | 2008-10 | 2011-07 | 2011-07 | 120.0***[3] | 9.56*** | 160.87*** | 23.19*** |
| Germany | 2008-10 | | | 2008-10 | | 2008-10 | 14.72*** | 6.22*** | 238.01*** | 18.21*** |
| Italy | 2008-10 | 2011-07 | | 2008-10 | 2011-07 | 2011-07 | 147.04*** | 16.25*** | 160.61*** | 24.95*** |
| Japan | 2008-10 | | | 2008-10 | | 2008-10 | 235.22*** | 4.56*** | 479.20*** | 14.44*** |
| New Zealand | 2008-10 | 2010-02 | 2011-06 | 2008-10 | 2010-01 | 2008-10 | 109.59*** | | 227.72*** | 5.01** |
| Sweden | 2008-10 | | | 2008-10 | 2010-02 | 2008-10 | 66.33*** | 2.67** | 141.29*** | 9.92*** |
| United Kingdom | 2008-10 | | | 2008-10 | 2009-10 | 2008-10 | 103.34*** | 1.60* | 214.87*** | 6.60** |
| United States | 2008-09 | | | 2008-09 | 2010-02 | 2008-09 | 165.01*** | 4.30*** | 330.15*** | 12.69*** |

*/**/*** indicate the statistical significance.

Table 3: Sovereign CDS spreads in the old normal, in the crisis and in the new normal
(in basis points)

| **Old normal** (Jan 2004 – Aug 2008) | All (28) | Latin America (5) | Emerging Asia (7) | Eastern Europe (3) | Other (3) | Advanced Econ (10) |
|---|---|---|---|---|---|---|
| Average | 72.7 | 171.3 | 98.1 | 24.9 | 145.0 | 5.6 |
| Average change | -0.3 | -2.5 | 0.2 | 0.9 | -0.3 | 0.2 |
| Volatility | 76.4 | 132.3 | 66.1 | 32.0 | 109.5 | 9.6 |
| Average correlation | 0.58 | 0.65 | 0.70 | 0.82 | 0.61 | 0.43 |
| **Crisis** (Sep 2008 – Apr 2009) | | | | | | |
| Average | 240.2 | 288.3 | 308.0 | 277.7 | 470.8 | 80.4 |
| Average change | 12.6 | 17.5 | 11.9 | 22.8 | 14.8 | 7.7 |
| Volatility | 362.5 | 331.9 | 477.8 | 318.5 | 624.8 | 103.1 |
| Average correlation | 0.74 | 0.98 | 0.88 | 0.92 | 0.96 | 0.71 |
| **New normal** (May 2009 – Dec 2014) | | | | | | |
| Average | 113.7 | 118.7 | 112.0 | 179.0 | 187.0 | 69.8 |
| Average change | -1.4 | -2.0 | -2.2 | -2.4 | -0.5 | -0.6 |
| Volatility | 75.5 | 65.3 | 77.8 | 106.4 | 100.5 | 56.4 |
| Average correlation | 0.61 | 0.83 | 0.87 | 0.76 | 0.71 | 0.51 |

Table 4: Unconditional correlations of global factors with global financial market variables in the old normal and new normal

| | First factor[1] | | Second factor[1] | |
|---|---|---|---|---|
| | Old normal | New normal | Old normal | New normal |
| Change in VIX[1] | 0.5293 | 0.6548 | 0.4146 | 0.2171 |
| Return on S&P500[2] | -0.5983 | -0.6716 | -0.4767 | -0.1023 |
| Change in CDX NA IG[1, 3] | 0.6683 | 0.8047 | 0.4288 | 0.2054 |
| Change in CDX NA HY[1, 3] | 0.6049 | 0.7266 | 0.5243 | 0.2385 |
| Change in iTraxx Europe[1] | 0.6982 | 0.8616 | 0.4176 | 0.0189 |
| Change in 10-year US Treasury yield[1] | -0.1303 | -0.3566 | 0.0473 | 0.0561 |

[1] Monthly change. [2] Change in logs. [3] Five-year on the run spreads.

Sources: Bloomberg; JPMorgan Chase; authors' calculations.

Table 5: The first factor: t-statistics from regressions of factor loadings on fundamentals and dummy variables

| | Old normal | | New normal | | Crisis | | Taper tantrums | |
|---|---|---|---|---|---|---|---|---|
| | Full | Stepwise | Full | Stepwise | Full | Stepwise | Full | Stepwise |
| Ratio of government debt to GDP | 0.610 | | -0.057 | | -0.043 | | -0.420 | |
| Current account balance as ratio to GDP | -0.378 | | 0.148 | | -0.046 | | 0.860 | |
| Sovereign credit rating | 2.591** | | -0.147 | | -0.737 | | -0.444 | |
| GDP growth | 0.220 | | 0.305 | | 0.402 | | -0.055 | |
| Bond market size | 0.934 | 1.765* | -0.432 | | 0.529 | | -0.035 | |
| EM dummy | 3.372*** | 2.443** | 0.981 | 4.255*** | 1.458 | 3.457*** | 0.851 | 2.838*** |
| Asia dummy | 0.163 | | 0.721 | | -0.869 | | -0.259 | |
| $R^2$ | 0.4219 | 0.1940 | 0.4782 | 0.4105 | 0.3953 | 0.3149 | 0.2779 | 0.2365 |
| Adj $R^2$ | 0.2195 | 0.1296 | 0.2956 | 0.3878 | 0.1837 | 0.2886 | 0.0252 | 0.2071 |
| AIC | -3.2308 | -3.256 | -4.0366 | -4.3431 | -3.9458 | -4.2495 | -2.5892 | -2.9620 |
| Schwarz | -2.8502 | -3.113 | -3.6560 | -4.2480 | -3.5651 | -4.1543 | -2.2085 | -2.8668 |

Note: Only t-statistics are shown, */**/*** indicate significance at 10%, 5% and 1% level.

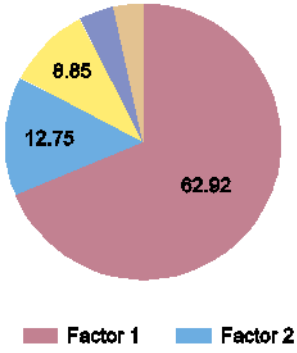
Table 6: The second factor: t-statistics from regressions of factor loadings on fundamentals and dummy variables

| | Old normal | | New normal | | Crisis | | Taper tantrums | |
|---|---|---|---|---|---|---|---|---|
| | Full | Stepwise | Full | Stepwise | Full | Stepwise | Full | Stepwise |
| Ratio of government debt to GDP | -1.180 | | 0.024 | | 1.206 | | 0.248 | |
| Current account balance as ratio to GDP | 1.057 | | -0.266 | | -0.300 | | -0.520 | |
| Sovereign credit rating | -4.585*** | -7.394*** | 0.026 | | 0.458 | -2.862*** | -1.699 | -2.454** |
| GDP growth | -0.425 | | -1.048* | | -1.721 | | 0.650 | |
| Bond market size | -0.087 | | 1.791 | | -0.893 | -2.131** | 0.226 | |
| EM dummy | -1.279 | | 1.189 | 5.200*** | 0.526 | | 1.812* | 2.738** |
| Asia dummy | -0.421 | | -0.074 | | 2.021* | 3.718*** | 0.221 | |
| $R^2$ | 0.7299 | 0.6777 | 0.6229 | 0.5098 | 0.7455 | 0.7229 | 0.2779 | 0.6443 |
| Adj $R^2$ | 0.6353 | 0.6653 | 0.4909 | 0.4909 | 0.6564 | 0.6882 | 0.0252 | 0.6158 |
| AIC | -1.241 | -1.4930 | -0.9139 | -1.0802 | -1.3012 | -1.5017 | -2.5892 | -1.3502 |
| SBC | -0.8603 | -1.3978 | -0.5332 | -0.9850 | -0.9206 | -1.3114 | -2.2085 | -1.2075 |

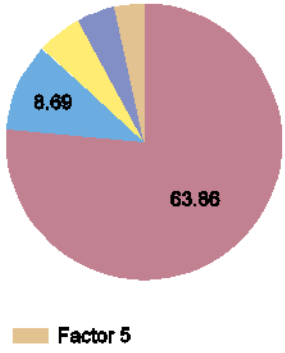
Note: Only t-statistics are shown, */**/*** indicate significance at 10%, 5% and 1% level.

Figure 1: Principal components of changes in sovereign CDS spreads

Old normal: Jan 2004 – Aug 2008

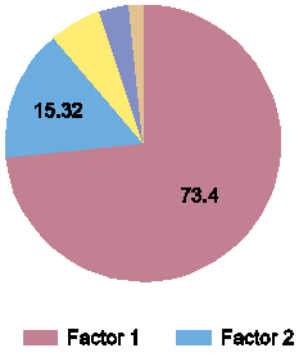



New normal: May 2009 – Dec 2014





Crisis episode: Sep 2008 – Apr 2009




Taper tantums: May 2013 – Dec 2013

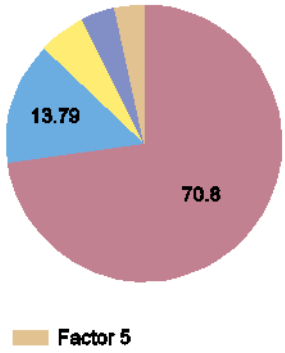
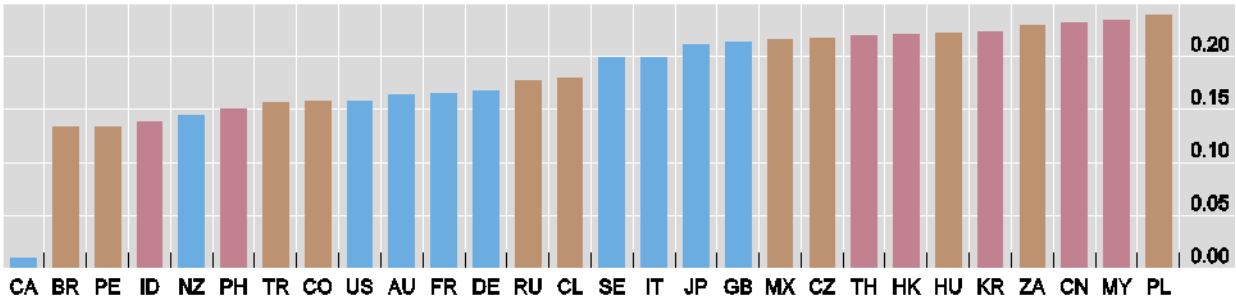



Figure 2: Loadings on the first global factor

Old normal




New normal

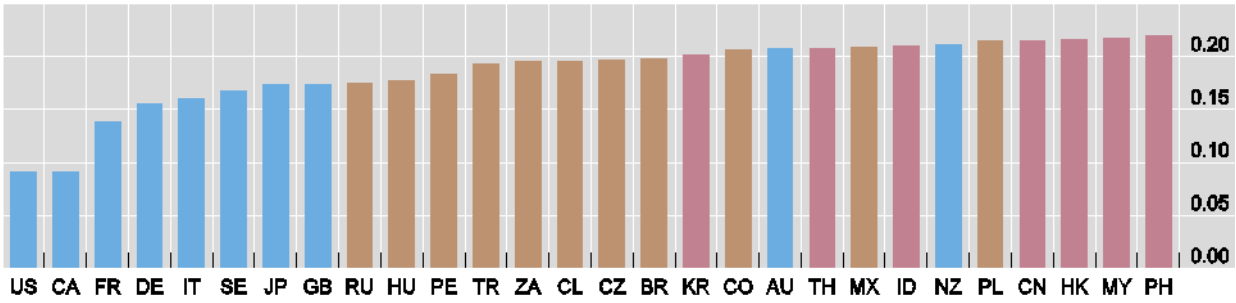
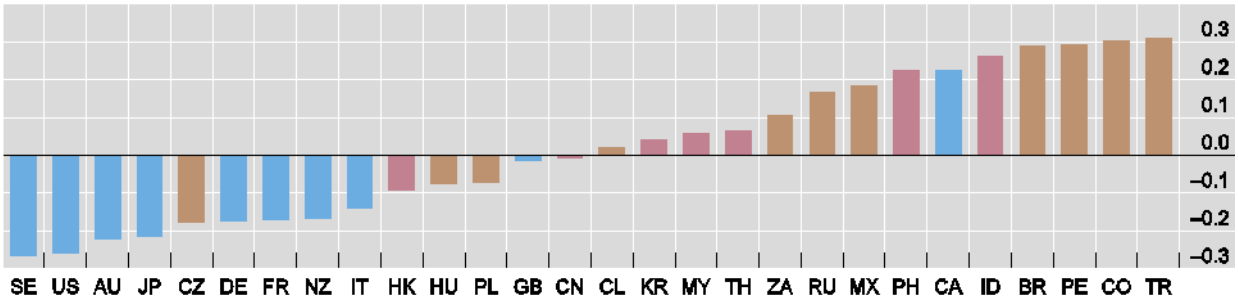


Figure 3: Loadings on the second global factor

Old normal




New normal