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EMERGING MARKET SPREADS IN THE RECENT FINANCIAL TURMOIL

by Alessio Ciarlone, Paolo Piselli and Giorgio Trebeschi*

Abstract

This work examines how much of the variation in emerging market economies' (EMEs) spreads can be ascribed to 'country-specific' factors rather than to 'common' factors, once the existence of an interaction between the state of macroeconomic fundamentals and global financial conditions is properly taken into account. By means of factor analysis we find that a single common factor is able to explain a large part of the co-variation in EME spreads in the period January 1998-June 2008; in turn, the common factor can be traced back mainly to financial market volatility. Once we have controlled for a set of idiosyncratic macroeconomic fundamentals, the common factor turns out to be a significant determinant of EME spread variations in the recent period of financial turmoil. Finally, the interaction term between global financial conditions and the state of macroeconomic fundamentals plays a significant role in most of the countries, allowing us to show that, for some less virtuous economies, the negative effects of a worsening of global conditions have been magnified by weakening domestic macroeconomic fundamentals.

JEL Classification: C10, C22, F34, G15.
Keywords: sovereign spreads, emerging markets, factor analysis, international finance.

Contents

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1. Introduction

Since July of last year, severe turbulence has shaken the global financial system. In the advanced countries, economic activity has slowed significantly and the outlook is deteriorating rapidly. The emerging market economies initially appeared to be resilient both to the financial turmoil and to the slowdown in the advanced economies, thanks to favourable cyclical conditions and stronger overall fundamentals than a decade ago. Recently, their resilience has been severely put to the test by a further deterioration in global financial conditions and a worsening global macroeconomic outlook. A number of emerging countries in Europe have already faced acute financial tensions and a possible credit crunch. Risks of further contagion have grown.

This work examines how financial conditions in individual EMEs have been affected by the interaction of global and domestic factors during the turmoil, focusing particularly on sovereign bond spreads, which represent a more internationally comparable indicator of credit risk than CDS premia or local bond spreads;[1] it then draws some implications for the risks faced by EMEs in the current situation. Section 2 reviews some stylized facts regarding the recent evolution (since mid-2007) of financial conditions in EMEs. Section 3 describes the model developed to disentangle the common external from the idiosyncratic determinants of EME sovereign bond spreads during the recent financial turmoil. Section 4 analyses the results in depth and Section 5 concludes with a discussion of the pattern of risks for different groups of EMEs.

2. A few stylized facts

Spreads on emerging economies' sovereign debt had reached historically low levels in the first half of 2007, at a time of ample global liquidity and moderate risk aversion. The EMBI Global Index, which had been gradually declining from a peak of 1,631 basis points on September 10, 1998, reached a low of 150 basis points on June 1, 2007.[2] More interestingly, since 2005 EME sovereign spreads had fallen well below the spreads on high-yield US corporates, often considered by international investors to belong to the same asset class (**Chart 1**), reflecting a perception of reduced sensitivity of EMEs to external shocks.

From the outbreak of the financial crisis until early June 2008, the rise in EME spreads was fairly moderate. A broad range of markets worldwide began to experience heightened risk aversion and a sharp fall in liquidity; EME spreads started to rise, as did those of similar asset classes such as high-yield US corporates, but remained well below historical peaks.

[1] The underlying bonds are targeted specifically at international investors and are traded in international markets, with legal and institutional features that are broadly similar across countries.

[2] The EMBI Global index, produced by JP Morgan-Chase, tracks total returns for US dollar-denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities, such as Brady bonds, loans, and Eurobonds. Currently, the EMBI Global covers 191 instruments across 32 countries.

The rise in spreads became much steeper after mid-June 2008 (**Chart 2**) as the financial crisis deepened and the downturn in the advanced economies proved more severe and long-lasting than initially expected. Over the summer, the rise reflected mainly the deterioration in the economic outlook for the main EME areas. While initially it had been expected that the adverse effects from the financial market turmoil would be felt mainly by the US economy and the countries most closely linked to it, such as Mexico and Canada, over time growth projections for other advanced economies and for emerging economies were also revised downward (**Chart 3**). In September and October, however, as the global financial turmoil became more acute, a direct transmission of financial stress from US and European financial markets put additional upward pressure on EME spreads. The EMBI Global Index rose by more than 300 basis points between early September and mid-October alone, reaching levels last observed in March 2003.

Stock markets tell a similar story. After an initial phase of partial decoupling from developments in the advanced economies, from May on emerging market stock prices declined sharply (**Chart 4**) as global risk aversion increased and the economic outlook became gloomier. The overall decline was much larger than in the advanced countries (52 and 37 per cent, respectively, between early May and mid-October). The losses recorded have been particularly pronounced in emerging Europe and Latin America (65 and 59 per cent), wiping out all the gains made earlier in the year. The slide of Asian stock markets had started some time earlier – around October 2007; valuations in these markets are currently below the levels recorded in early 2006.

Even after the latest increase, EME sovereign spreads have remained well below those on high-yield US corporate bonds, indicating that markets have not lost sight of the underlying improvement inof fundamentals in many EMEs. Moreover, financial market participants seem to be taking account of country-specific sources of vulnerability. In fact, pressures on spreads have been particularly severe in countries with more volatile political developments (such as Ecuador, Russia, Ukraine, and Venezuela) (**Chart 5, upper panel**) and in those with wide and persistent external imbalances, often financed mainly through volatile portfolio capital flows (**Chart 5, lower panel**). The latter are primarily countries in Eastern Europe, but they also include Turkey and South Africa. To the extent that markets are able to discriminate across countries more successfully than in the past, this may protect EMEs with better fundamentals from the risk of contagion.

Nevertheless, the risk of a sharp decline of international private capital flows to EMEs – which peaked at over US$800 billion in 2007 – has increased significantly in the third quarter, as global de-leveraging is not only raising the cost but also reducing the availability of external financing for EMEs. Data on the activity of US mutual funds specializing in emerging markets show net selling of more than 40 billion of stocks since the beginning of 2008 (**Chart 6**), mainly concentrated in Asia. Issuance of stocks halved in the first half of 2008. As regards emerging market bonds

(corporate and sovereign), issuance activity contracted significantly in the first half of 2008 ($77.5 billion, from $139 billion in the first half of 2007) and indications are that it will come to an almost complete halt in the third quarter, together with the drying up of other sources of external financing such as syndicated loans. This is also confirmed by the sharp disinvestment by US mutual funds since July.

The turnaround in foreign capital flows has been accompanied by increased pressure on exchange rates. During the summer, a broad range of EME currencies, which until then had been mostly appreciating against the dollar (in Asia and Latin America) or the euro (in emerging Europe), started to come under strong selling pressure (**Chart 7**). Exchange depreciations have been particularly large in Latin America. In a number of countries, even among those without explicit exchange rate pegging arrangements, major central bank interventions have limited the currency slide.

Based on this evidence, some questions arise: first, how much of the worsening of EMEs' financial conditions is due to "exogenous" or global factors? How much, on the other hand, can be attributed to domestic developments (in particular to a weakening of domestic macroeconomic conditions)? Second, when looking at differences in asset price responses to the common global shock across EMEs, to what extent have international investors discriminated among the latter? Have EMEs with weaker fundamentals been hit harder by the global shock than the others?

3. An analysis of the determinants of EME sovereign spreads

3.1. Methodology

A simple model of EME sovereign bond spreads - a direct measure of a country's creditworthiness extensively used by researchers and market analysts - is estimated to identify their domestic and external determinants. We first apply factor analysis to a sample of 14 EME sovereign spreads, with monthly data and for the period January 1998-June 2008. A single common factor is found, which is able to explain a large part of the co-variation in spreads. The common factor can be interpreted as a summary measure of global financial conditions. Individual countries' spreads are then regressed on the common factor and on a set of country-specific macroeconomic variables. Having constructed a synthetic indicator of underlying vulnerability to external shock for each country (hereafter the vulnerability indicator), we also allow for possible time-series interaction between global financial conditions (summarized by the common factor) and countries' macroeconomic fundamentals (proxied by the vulnerability indicator).[3]

[3] This extension improves upon a work by the same authors; see Ciarlone et al. (2008).

3.2. The common factor

In the empirical literature, global factors have been proxied by a wide range of variables, used individually or jointly in different econometric specifications;[4] it is generally found that these global factors represent economically and statistically significant explanatory variables for the dynamics of EME spreads. The approach chosen here instead uses factor analysis to identify the common force that drives the co-movement of EME spreads. By doing so, it should be possible to capture more information than by appealing simply to one - or more - of the variables used in the empirical literature. The common factor may be thought of as a summary proxy measure for the above variables, as well as for other less measurable events such as excess co-movement and episodes of contagion.

The procedure followed to extract the common factor is described in **Annex I**. The sample of countries comprises Brazil, Bulgaria, China, Colombia, Ecuador, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa, Turkey and Venezuela, whose EMBIG spreads are available for the longest time span. Monthly data are used to align the frequency of the financial series to that of the macroeconomic variables used in the second part of the analysis. The sample period runs from January 1998 to June 2008. The results are robust to changes in the country sample and the time span.

We find that a single common factor captures a large share of the co-variation among the spreads of the countries included in the sample. Despite not having a precise economic meaning, this common factor presumably captures the portion of EME spread variability that reflects global economic and financial developments, rather than individual country developments. This hypothesis seem to be supported by the high unconditional correlation between the common factor and a number of financial variables, such as the level of long-term US interest rates, the slope of the yield curve, global stock market indices, and the VIX index, which is usually regarded as a good proxy for international investors' appetite for risk (**Chart 8**).[5] A more formal econometric procedure confirms that a significant relationship exists between the common factor and the VIX index.[6]

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[4] The proxies used in the literature include the level of short- and long-term interest rates in advanced economies (mainly the US), as a measure of global liquidity conditions (Eichengreen and Mody, 1998a and 1998b; Kamin and Kleist, 1999; Arora and Cerisola, 2001; Ferrucci, 2003; Garcia-Herrero and Ortiz, 2005; Rozada and Levy Yeyati, 2005); their volatility, as a measure of the uncertainty surrounding the path of monetary policy in advanced economies (Arora and Cerisola, 2001; Culha et al., 2006); the yield spread between low- and high-rated corporate bonds or US long-term Treasury bonds, as a measure of international investors' appetite for risk (Ferrucci, 2003; Garcia-Herrero and Ortiz, 2005; Rozada and Levy Yeyati, 2005; Culha et al., 2006); the US stock market index, as a measure of a general market risk (Ferrucci, 2003); and the OECD leading indicator of economic activity, as a measure of growth prospects in advanced economies (Garcia-Herrero and Ortiz, 2005).

[5] The VIX index is the Chicago Board Options Exchange Volatility Index and is a market estimate of future volatility; it is calculated as a weighted average of the implied volatilities of eight put and call options written on the S&P 500 index. The VIX index is considered a good measure of international investors' appetite for risk.

[6] The estimate is made using the fully-modified OLS (FM-OLS) developed by Phillips and Hansen (1990) to address the problem of endogeneity and non-stationarity of the variables.

3.3. The model

We start from a model widely used in the literature on EME spreads, i.e. the one originally developed by Edwards,[7] but augmented with a term meant to capture the possible interaction between the state of a country's macroeconomic fundamentals and global financial conditions. For each country in the sample,[8] we estimate the following equation:

$$s_t = \alpha_0 + \alpha_1 \cdot F_t + \alpha_2 \cdot IND_t \cdot F_t + \sum_j \beta_j Macro_j + \varepsilon \qquad (1)$$

where s is the log spread,[9] F is the common factor, *IND* is a vulnerability index measuring the overall health of the domestic economy, *Macro* is a country-specific set of j macroeconomic variables and ε is the error term.

The macroeconomic variables are allowed to differ from country to country. A common set of potential determinants of EME spreads was tried in the country-by-country regressions alongside the common factor; only those that turned out to be statistically significant were retained (**Annex II**).[10]

The vulnerability indicator *IND* used to measure the state of the economy facing external shocks was constructed by taking the simple average of the standardized values of a small set of variables which, based on the economic literature, can be expected to capture a country's vulnerability to external financial shocks. A detailed explanation of the procedure followed to construct the index is provided in **Annex III**.

The country-by-country estimation was performed using the Phillips and Hansen FM-OLS procedure; all variables are recorded at monthly frequencies.[11] Regression results for the influence

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[7] Edwards (1984) assumed that the spread between a sovereign bond yield and a risk-free interest rate, which is a function of the (subjective) probability of default assigned by international investors to a given country, is related to a set of domestic, as well as international, macroeconomic and financial variables that influence investors' evaluation of the country's creditworthiness.

[8] In addition to the 14 countries included in the factor analysis, the following ones have been added in the FM-OLS regressions: Czech Republic, Hungary, Latvia, Lithuania, Romania, Slovakia and Ukraine.

[9] Formulations in terms of logs are standard in the literature on EME spreads. With this formulation, it is implicitly assumed that a shock of given size to the explanatory variables will determine a certain proportional change in the spread, regardless of the spread's initial level. The common factor is also extracted from log-spreads, as explained in Annex I.

[10] It seemed natural to take into account the stock and flow variables relevant for both domestic and external solvency. Moreover, adverse developments in the exchange rate, which entail an escalating burden of external indebtedness, are also expected to lead to higher spreads. Indicators of domestic solvency include the level of public debt (scaled to GDP); interest rates; inflation; the output growth rate; and government primary balances (scaled to GDP). Among indicators of external solvency the following are considered: the stock of foreign-currency denominated debt (scaled to GDP or to exports); the current account balance (scaled to GDP); and total debt service or interest payments on external debt (scaled to total external debt, exports or international reserves). In addition, the share of external debt with a remaining maturity of less than one year can be considered a proxy for roll-over risk.

[11] Variables with a lower original frequency were linearly interpolated. Although this is a widely used technique in empirical works, we recognise that it comes at the cost of imposing a (linear) model on the data generating process, which might not necessarily be valid.

of the common factor (including the interaction term with the vulnerability indicator *IND*) are provided in **Table A4** of Annex III.[12]

3.4. The results

The common factor is found to exert a statistically significant effect on all the spreads of our sample: as expected, shocks to the common factor are systematically associated with variations of the same sign in yield differentials. This is well illustrated by the individual country figures reproduced in **Chart 9**. In each figure, the red line indicates the influence of the common factor (including its interaction with the vulnerability index), while the blue line indicates the overall model prediction, which also includes the effect of the country-specific macroeconomic factors. When the influence of the latter is favourable (it tends to lower spreads), the area between the two lines is shaded in blue; when it is unfavourable (it tends to raise spreads), the area is shaded in red. Finally, the black dots indicate the actually observed monthly spreads. The figures show that the common factor is usually the predominant influence driving large swings in spreads over time. However, country-specific macroeconomic conditions can occasionally account for significant departures of actual spreads from the values that would be predicted by the common factor alone.

Overall, over the whole sample and as an average across all countries, the common factor accounts for 73 per cent of deviations of actual country spreads from their respective means, macro factors for 19 per cent, and residuals for the remainder (8 per cent).

Although it has been estimated *in levels*, the model also does a reasonably good job of accounting for *changes* in EME spreads. Even at the highest frequency (i.e. month-to-month variations in spreads), on average over the whole sample, shocks to the common factor account for just over 50 per cent of spread variability (average across all countries); the share of total variability that can be attributed to the common factor is similar also at three-month and one-year intervals; however, the share explained by macroeconomic conditions, which is negligible for month-to-month variations in spreads, rises to around 20 per cent for variations over one year.

The influence of the common factor described above also includes the effect of the interaction between the factor itself and our vulnerability index, which is supposed to reflect broadly the state of each country's fundamentals. For 16 out of 21 countries in our sample, this interaction turns out to be strongly statistically significant. According to the model specification outlined in paragraph 2.3, the spreads' overall sensitivity to a change in the common factor can be measured by the term

[12] Regression coefficients for the influence of the common factor (including the interaction term with the vulnerability indicator *IND*) are displayed in the Table; the evolution of the spread's overall sensitivity to a change in the common factor, which is time-varying according to the value taken by the vulnerability indicator *IND,* is shown in the Chart for each country.

$$\hat{\alpha}_1 + \hat{\alpha}_2 \cdot IND_t \qquad (2)$$

which varies over time according to the value taken by the vulnerability indicator *IND*. The evolution of this vulnerability index varies significantly across the countries in our sample (**Chart A1** in Annex III): for most Asian and Latin American countries, as well as for Russia and Turkey, it is generally lower in the latter part of the sample than at the beginning; by contrast, it tends to increase over time for a number of European EMEs, such as Hungary, Latvia, Lithuania, Poland and Romania. As a result, the model predicts that the sovereign spreads of the latter group of countries would be more sensitive to changes in global financial conditions at the outbreak of the financial turmoil in June 2007 than on average over the whole sample, while for most other countries improved fundamentals translate into reduced sensitivity.[13]

4. The impact of the recent financial turmoil on EME spreads

We now turn to the analysis of how the sovereign spreads of the individual countries in the sample have been affected by the financial turmoil. By decomposing the observed changes in spreads (see **Annex IV**), we can isolate the effects of (a) changes in the common factor and (b) changes in the idiosyncratic component.

Chart 10 shows the overall change in spreads (represented by the dots) in the period from June 2007 to mid-October 2008, and how much of it can be attributed to changes in the common factor (represented by the purple bars)[14] and to changes in the macroeconomic component (represented by the blue bars).[15] The white bars indicate the residuals, i.e. the unexplained part of the overall change in spread. The chart suggests that the common factor played a dominant role as a determinant of the overall change in EMEs up to mid-October 2008: on average, over 80 per cent of the observed increase in EME spreads is accounted for by the change in the common factor. Across countries, the observed change in spreads over that period is highly correlated with the change predicted by the common factor.[16]

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[13] Because spreads are expressed in log terms in the model, a given sensitivity implies a certain *proportional* change in the spread for a given change in the common factor. The corresponding *absolute* change in terms of basis points, however, obviously depends on the initial level of the spread. Since some of the countries that display a high spread sensitivity to the common shock (like Slovakia, Latvia and Lithuania) had very low spread levels at the start of the turmoil, their high sensitivity need not translate into a large *absolute* change in the level of spreads.

[14] The effect of the change in the common factor shown in the chart includes the effect of its interaction with the vulnerability index.

[15] The period considered is partly out of sample; in fact, the model was estimated over the period from January 1998 to June 2008. In order to extend the model predictions up to mid-October 2008, the common factor has been recalculated to that date. However, since most macroeconomic variables are only available up to June, the values of the vulnerability indicator and of country-specific macroeconomic factors are assumed to have remained at their June levels for the following three months.

[16] The cross-country correlation coefficient with the change in spreads predicted by the common factor (including the interaction term) is 0.85.

In the case of most Latin American countries (the only exception being Venezuela), as well as for Poland and Bulgaria, the adverse influence of the common component during the period of turmoil was partly offset by the negative contribution of the idiosyncratic domestic component, reflecting the improvement in macroeconomic conditions during that period. By contrast, in most other countries the contribution stemming from country-specific developments was unfavourable, adding to the adverse impact of worsening global financial conditions. This was particularly true for countries in emerging Europe (i.e. Hungary, Latvia, Lithuania, Slovakia, the Czech Republic and Romania). From the individual country figures in Chart 3 it emerges that around the time of the start of the turmoil country-specific macroeconomic factors were generally contributing to keep spreads low in most Latin American and Asian countries (the main exception being China) as well as in Russia,[17] while they were less favourable (with either a neutral or a positive contribution to spread levels) in European EMEs and in South Africa.

Country-specific macroeconomic conditions affect spreads not only via the country-specific macro component just described, but also via the sensitivity to the common factor, which reflects each country's vulnerability and can vary over time. In **Chart 11** the effect of the common factor (already shown in Chart 4) is further decomposed into a) the effect that would have prevailed if the country's sensitivity to the common factor had been equal to the average over the whole sample (the light orange bars) and b) the additional effect due to the difference between the estimated sensitivity during the turmoil and the average one (the dark orange bars). The latter effect is only displayed for the 16 countries where this sensitivity turns out to be well-captured by our vulnerability index.[18] The chart shows that the spreads of a group of countries in emerging Europe (Hungary, Latvia, Lithuania, Poland and Romania), which at the start of the turmoil had poorer fundamentals compared with the historical average, were more sensitive to the common factor than would have been the case under average conditions. By contrast, several Asian and Latin American countries, as well as Russia and Turkey, had lower than average sensitivity during the turmoil.

Overall, with the exception of a few countries, the model tends to under-predict the change in spreads over the period June 2007-October 2008 (the residuals in Chart 10 are mostly positive). A possibility is that the positive contribution of residuals to spread changes during the turmoil partly reflects a correction from unusually low spreads (unusually low risk premia) at the start of the turmoil. Another possible interpretation is that changes in actual spreads reflect in part an expected deterioration in underlying macroeconomic conditions, imperfectly captured by our sample macroeconomic data, which run only up to June 2008. The failure to take into account more recent

[17] In the case of China, the country-specific macroeconomic factors that contributed to higher spreads around the start of the turmoil were higher-than-average domestic interest rates and short-term external debt as a percentage of total external debt.

[18] Therefore, estimates are not available for Slovakia, Brazil, Peru, Venezuela, and the Philippines.

developments may have biased our results especially for commodity exporter countries in Latin America and Russia; in fact, as a result of the sharp decline in primary product prices since last July, conditions in the latter countries have started to deteriorate, making our results appear too sanguine.

5. Main conclusions and assessment of current risks

The analysis presented in the previous section shows that a common factor, which captures not only changes in global financial conditions but also the associated effects on the world economy, accounts for a large part (over 80 per cent) of the increase in EME spreads during the turmoil. Thus, EMEs as a whole are fairly exposed to the deterioration in global conditions.

In addition, country-specific macroeconomic developments have also played a role during the financial turmoil, both as a separate source of shocks and by influencing the sensitivity of individual country's to the common factor. Based on our analysis, we can tentatively separate the sample countries into three groups, according to their different degree of resilience.

A number of countries, mostly in Central and Eastern Europe, were relatively more vulnerable to the global shock and have been already affected quite severely. The negative effects have come from two sources: i) deteriorated fundamental conditions (especially external imbalances) already at the start of the turmoil, which increased their sensitivity to the external shock (this applies in particular to Hungary, Latvia, Lithuania and, to a lesser extent, Romania); and ii) the subsequent unfavourable evolution of macroeconomic conditions during the turmoil (particularly in Latvia and Ukraine), which further added to financial tensions.[19]

In a number of Asian countries (such as Malaysia and China), as well as in a few other large countries (Russia, Turkey), the impact of the global shock was initially contained due to sounder fundamentals. The subsequent evolution of macroeconomic conditions has in general been broadly neutral (only slightly unfavourable in Russia), at least up to last June.

In a number of countries in Latin America (which include Brazil), during the twelve months since the start of the financial turmoil macroeconomic conditions evolved favourably, thus counteracting the adverse impact of the global shock. This favourable effect was largely connected with the surge in commodity prices, especially in the first half of 2008, which lifted export revenues and supported economic growth. However, in view of the sharp decline in commodity prices since July (especially of oil and metals, which tend to react to the global cycle), this influence may already have started to reverse.

[19] At least until last June, only Poland and Bulgaria among Emerging European countries had experienced a favourable evolution of macroeconomic conditions during the turmoil.

As we look forward we can draw some important implications for the assessment of risks. Prospects seem unfavourable for emerging European countries due to their high vulnerability to a reversal of foreign capital inflows. The long-term process of structural economic and financial integration within core Europe, coupled with exceptionally favourable global conditions up to mid-2007, brought about very high rates of economic growth and financial deepening but also led to overheating and financial imbalances. A number of countries in the region are much more dependent on foreign borrowing today than they were at the beginning of the decade (Table 1). Based on standard measures of external vulnerability – such as the existence of large and persistent current account deficits (in some cases, well above 10 per cent of GDP over the last five years), the exceptionally rapid build-up of external financial liabilities, often denominated in foreign currency, during the favourable cyclical phase (foreign financial inflows were well over 15-20 per cent of GDP between 2003 and mid-2007), and the buoyant expansion of domestic credit – the situation in a number of countries (including the Baltic countries, Bulgaria, Hungary, Romania, and Ukraine) appears potentially as vulnerable as that of some Asian countries on the eve of the 1997-98 financial crises.

The emergence of financial tensions has so far been slower and less intense than during the Asian crises of 1997-98. In Central European countries with more stable macroeconomic situations (such as Poland and the Czech Republic) the relatively large weight of FDI in capital inflows and exchange rate flexibility may help to contain the effects of the external shock on the domestic economy.[20] In several countries of the region, the large presence of local subsidiaries of foreign banks (on average, almost 60 per cent of bank assets are in the hands of foreign-owned institutions) may secure more stable access to foreign funding, given the presumption of a long-term commitment by the latter, than in the case of arm's-length foreign borrowing.

However, only a limited number of institutions, mainly European, are heavily involved in the local markets. Thus, there is a risk that, if liquidity shortages or balance-sheet losses were to threaten the solvency or constrain the action of the international banks involved, a common lender problem may develop for these countries. In the Asian crises of 1997-98 a similar problem occurred with the retrenchment of Japanese banks.

A credit crunch due to an abrupt deceleration of foreign funding has already materialized in some of the most financially vulnerable economies in emerging Europe. In Hungary, despite efforts by the authorities to rein in the fiscal deficit, the economy is still very exposed due to the large current account deficit and external indebtedness; the rapid deterioration in financial conditions in

[20] However, exchange rate depreciation tends to worsen private sector balance sheets due to significant currency mismatches. Moreover, in countries that are very open to international trade, exchange rate depreciation tends to be transmitted rapidly to domestic prices. In any case, the exporting sector is being hit by the ongoing demand slowdown in the euro area.

the third quarter has forced the authorities to seek financial assistance from the ECB and the IMF. In the Baltic countries, where fixed exchange-rate regimes constrained policy actions and allowed large financial imbalances to emerge, the possibility of a hard landing has become quite tangible. In countries such as Romania, Bulgaria, and Ukraine domestic credit growth has been extremely rapid until very recently, and an abrupt deceleration is almost inevitable.

The risk of contagion throughout the European region could be significant owing to the strong economic and financial interconnections. Although in recent years contagion effects in sovereign debt markets have come to be regarded as a thing of the past, given the broadly based improvement of fundamentals, it is unclear whether this conclusion still holds in the current, much more fragile state of the global financial system.

While emerging countries in Latin America have so far withstood the global financial turmoil better than expected, downside risks have markedly increased for the economies of the region. Although the improvement of underlying fundamentals (with the notable exceptions of Venezuela and Argentina) has generally reduced the vulnerability to external shocks, the strong economic growth of recent years was to a large extent the result of favourable global cyclical conditions, that is strong demand, high prices for commodity exports, and low risk premia. Thus, the economies of the region could be rather vulnerable to the cyclical downturn in global industrial production and the weakening of commodity prices. Moreover, countries such as Brazil are fairly exposed to the financial turmoil because they are still highly dependent on international capital markets (though less dependent on foreign bank credit, given their diversified financial systems). Moreover, fiscal positions (which in many cases start from a rather pro-cyclical stance) could rapidly deteriorate, and in any case leave little room for manoeuvre to offset the adjustment in private demand.

Although emerging countries in Asia are relatively dependent on net exports, and particularly on demand for manufactures by the advanced countries, they can be expected to be more resilient to the global shock. The high rate of domestic saving, massive foreign exchange reserves, and less internationally integrated financial systems will continue to mitigate the impact of volatile external financial conditions. As China has become an important outlet for goods produced in the rest of the region, its economic resilience appears crucial to the whole area. Fortunately, the Chinese economy is insulated from the impact of the global financial turmoil, and wide margins exist to support domestic demand through a fiscal stimulus.

References

Arora, V., Cerisola M., 2001. "How Does US Monetary Policy Influence Sovereign Spreads in Emerging Markets?" IMF Staff Papers, 474-498.

Ciarlone, A., Piselli P., Trebeschi, G., 2008. "Emerging Markets Spreads and Global Financial Conditions", *Journal of International Financial Markets, Institutions and Money*, forthcoming.

Culha, O. Y., Ozatay, F., Sahinbeyoglu, G., 2006. "The Determinants of Sovereign Spreads in Emerging Markets", Working Paper, Central Bank of Turkey, No. 06/04.

Edwards, S., 1984, "LDC Foreign Borrowing and Default Risk: an Empirical Investigation, 1976-80", *American Economic Review*, 74/ 4, 726-34.

Eichengreen, B., Mody, A., 1998a. "What Explains Changing Spreads on Emerging Market Debt: Fundamentals or Market Sentiment?" Working Paper, NBER, No. 6408.

Eichengreen, B., Mody, A., 1998b. "Interest Rates in the North and Capital Flows to the South: Is There a Missing Link?" *International Finance Discussion Papers*, 35-37.

Ferrucci, G., 2003. "Empirical Determinants of Emerging Economies' Sovereign Bond Spreads", Working Paper, Bank of England, No. 205.

Garcia-Herrero, A., Ortiz, A., 2005. "The Role of Global Risk Aversion in Explaining Latin American Sovereign Spreads", Documentos de Trabajo, Banco de Espana, No. 0505.

Kamin, S., Kleist, K., 1999. "The Evolution and Determinants of Emerging Market Credit Spreads in the 1990s", Working Paper, BIS, No. 68.

Phillips, P. C. B., Hansen, B. E., 1990. "Statistical Inference in Instrumental Variables Regression with I(1) Processes", *Review of Economic Studies*, 57, 99-125.

Rozada, M. G., Levy Yeyati, E., 2005. "Global Factors and Emerging Market Spreads", Documento de Trabajo, Centro de Investigacion en Finanzas, Universidad Torcuato di Tella, No. 07/2005.

Chart 1. Emerging and advanced economies' spreads

Chart 2. Spreads in selected emerging markets during the turmoil
(basis points)

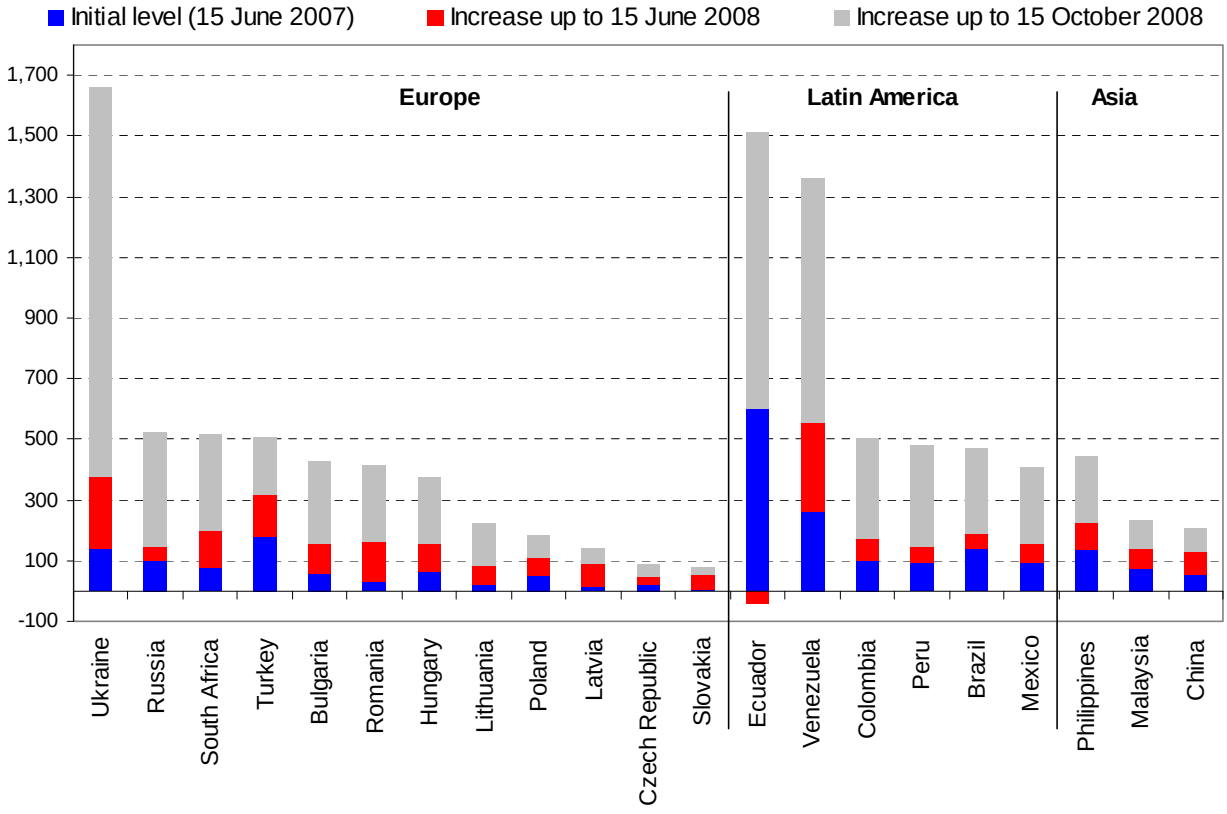
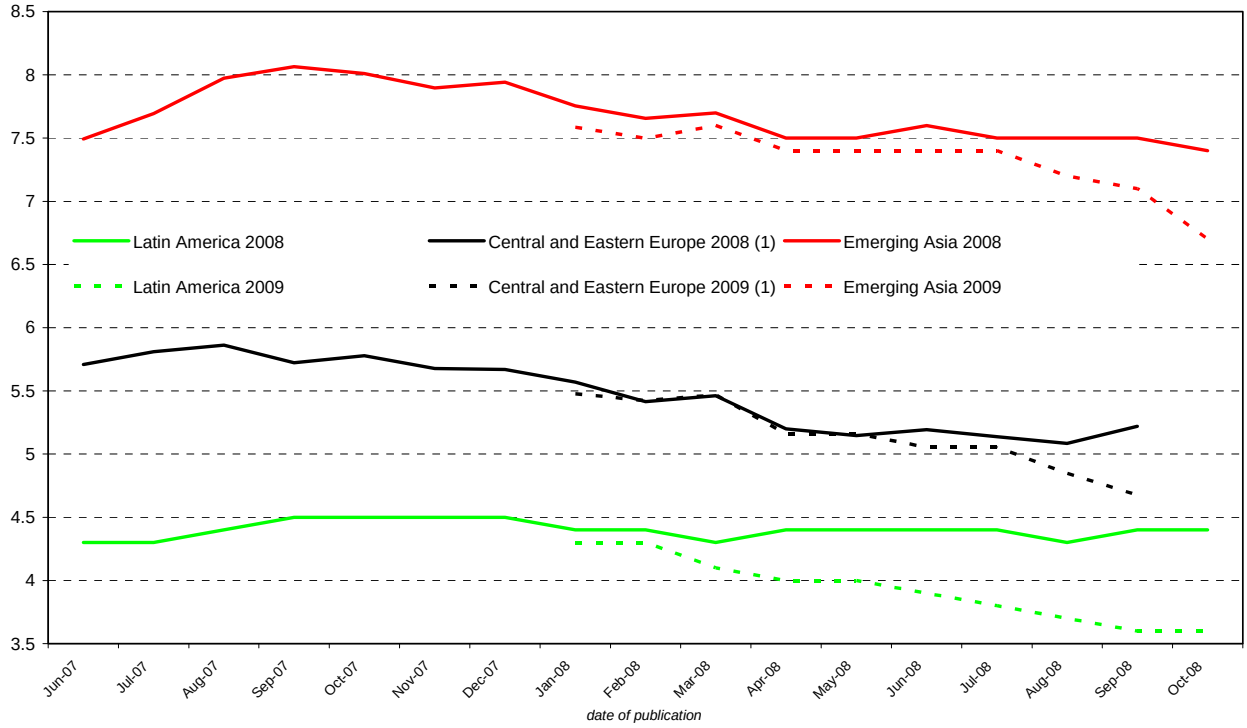


Chart 3. Consensus Economics GDP growth forecasts



Source: Consensus Economics.
(1) Russia is not included. October 2008 forecasts are not avaliable.

Chart 4. Equity prices in advanced and emerging economies
(January 2007 = 100)

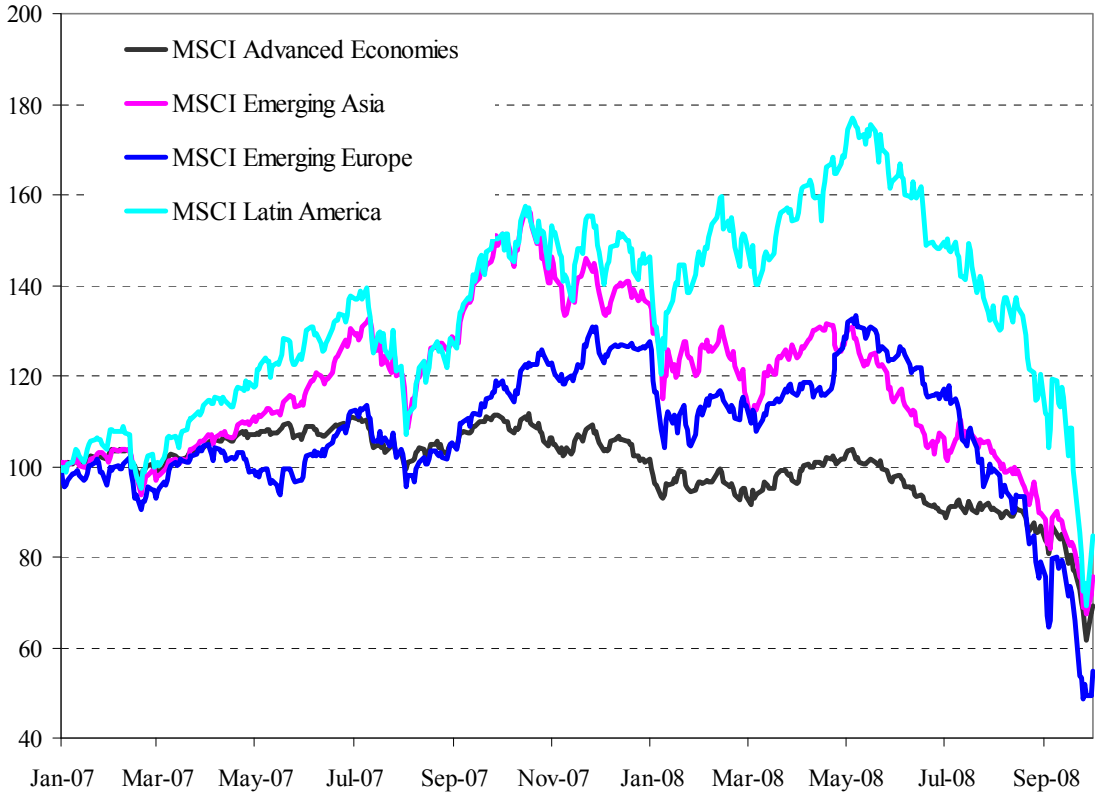
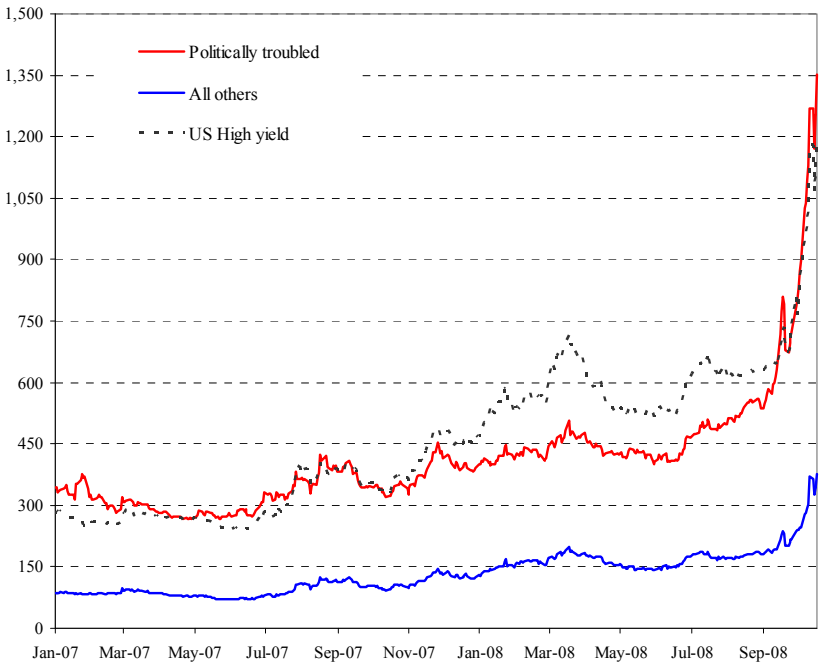


Chart 5. Spread behaviour in groups of selected emerging markets (1)

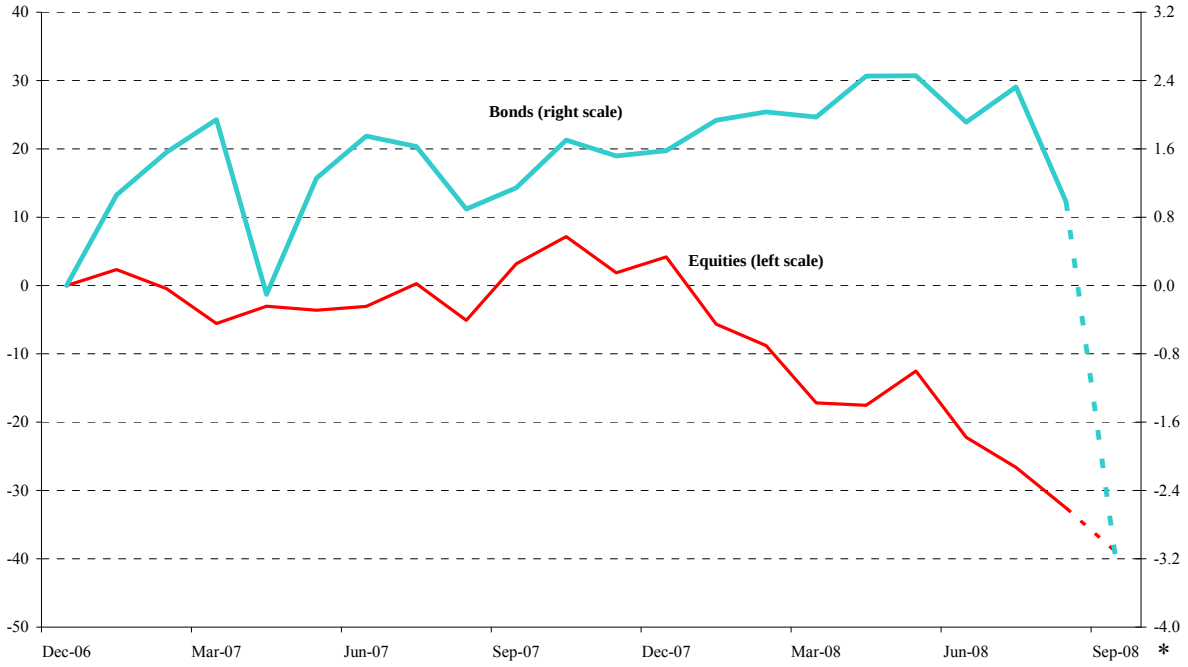


(1) Simple average of countries' spreads, in basis points.
"Politically troubled" countries are Ecuador, Russia, Ukraine and Venezuela.
"All others" are Brazil, Bulgaria, China, Colombia, Czech Republic, Hungary, Latvia, Lithuania, Malaysia, Mexico, Peru, Poland, Philippines, Romania, Slovakia, South Africa, Turkey.

"Large current account deficit" countries are Bulgaria, Colombia, Hungary, Latvia, Lithuania, Romania, South Africa and Turkey.
"All others" are Brazil, China, Czech Republic, Malaysia, Mexico, Peru, Poland, Philippines and Slovakia.

Chart 6. Emerging market funds: cumulative monthly net buying

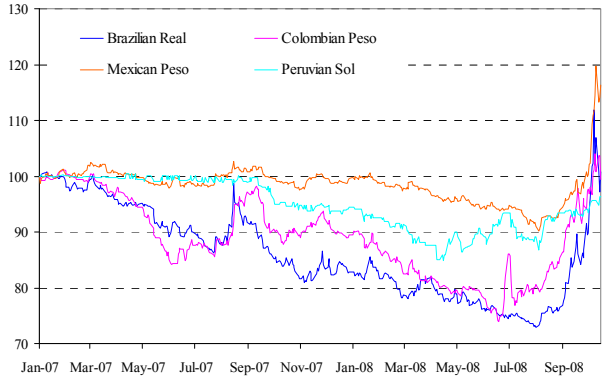
(USD billions - Dec. 2006=0)



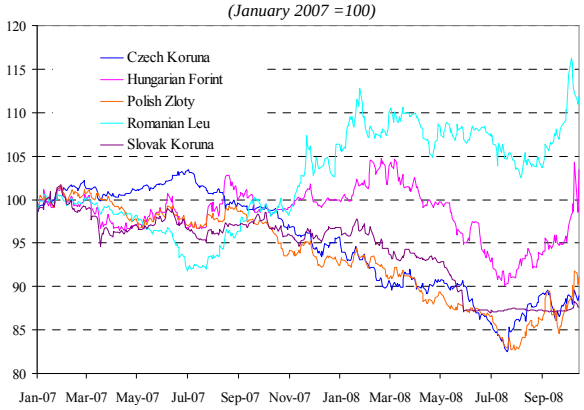
Source: Emerging Portfolio Fund Research.
* Estimated from weekly data.

Chart 7. Exchange rate developments in selected emerging markets

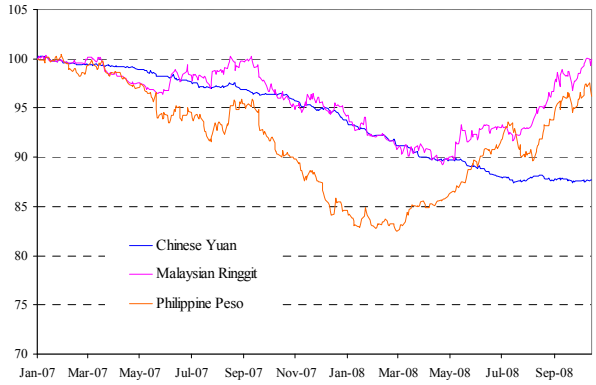
Latin America: exchange rate vs. USD
(January 2007 =100)



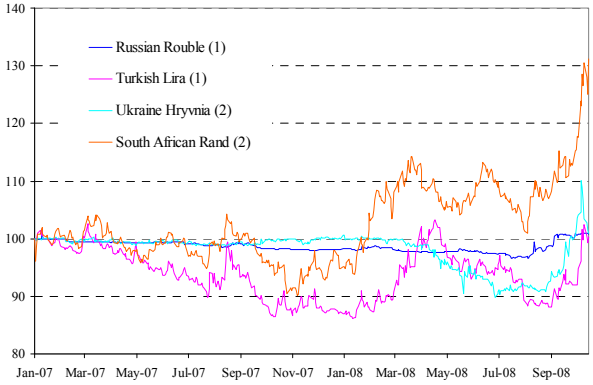
Central and Eastern Europe: exchange rate vs. EURO
(January 2007 =100)



Asia: exchange rate vs. USD
(January 2007 =100)

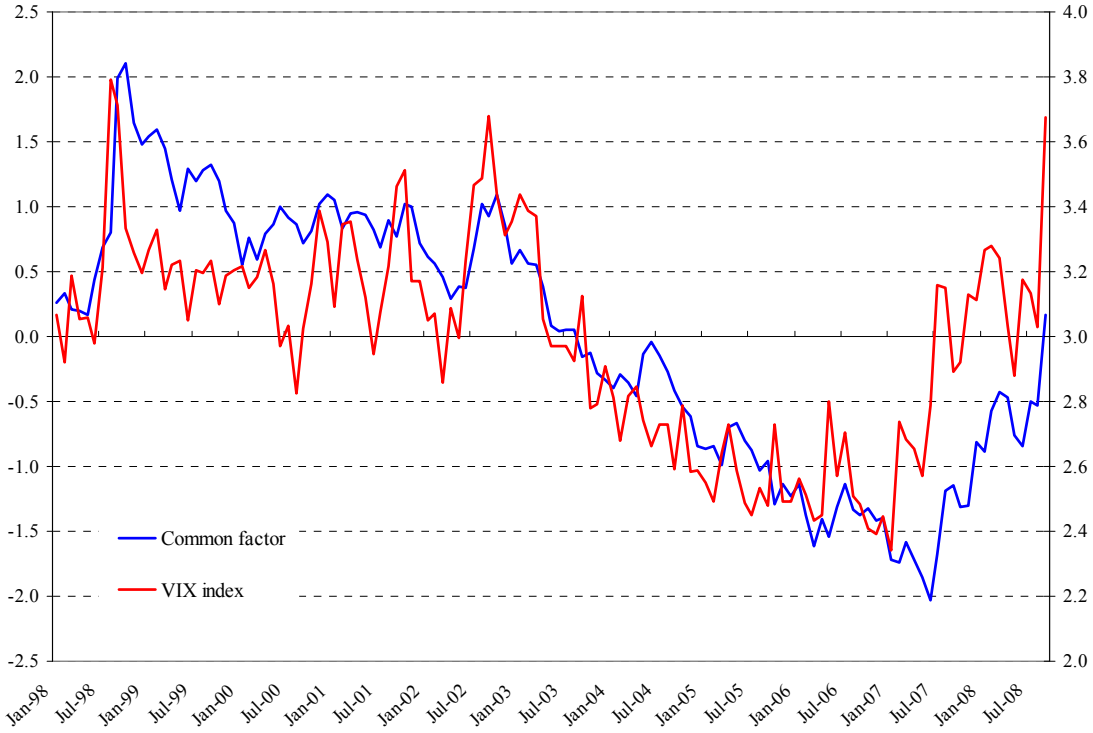


Other Countries: exchange rate vs. USD and EURO
(January 2007 =100)



(1) For Russia and Turkey, simple averages of exchange rates versus USD and EURO.
(2) For South Africa and Ukraine, exchange rates versus USD.

Chart 8. The VIX index and the common factor



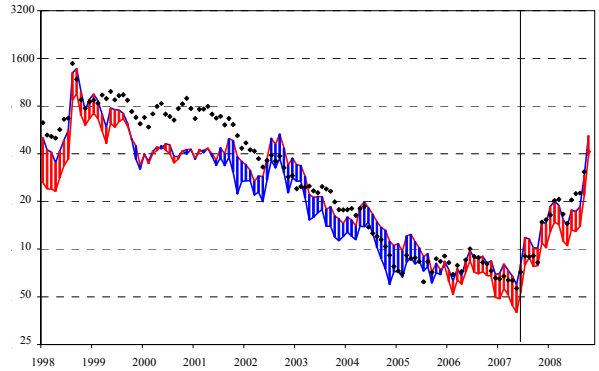
Note: VIX index on the right scale, in logs.

Chart 9. Actual versus modelled spreads

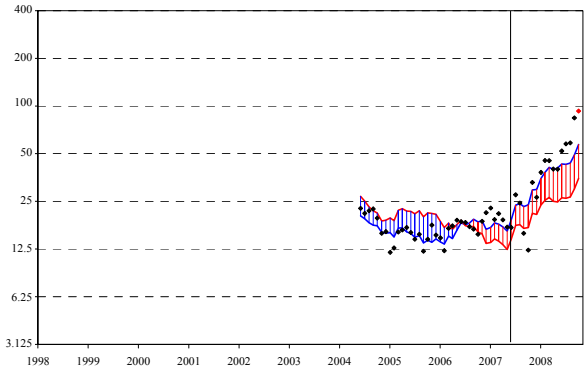
Europe

Common factor + macro variables ◆ Actual spread Common factor

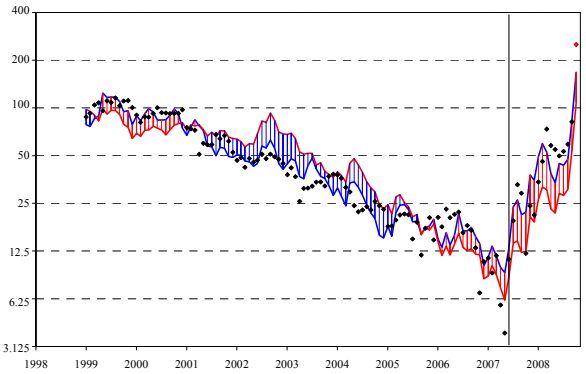
Bulgaria



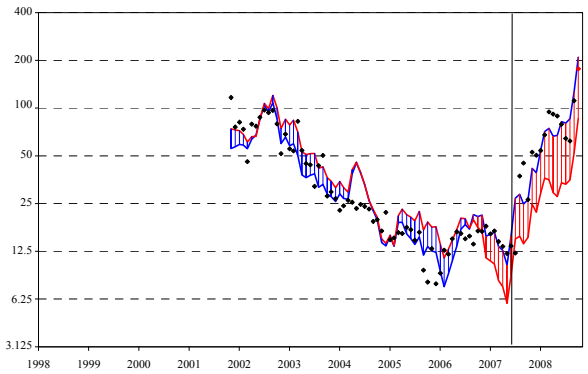
Czech Republic



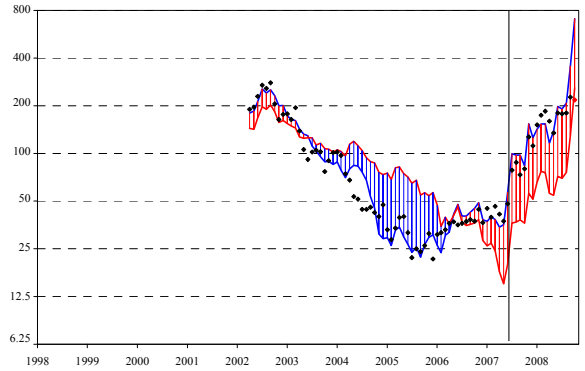
Hungary



Latvia



Lithuania



Poland

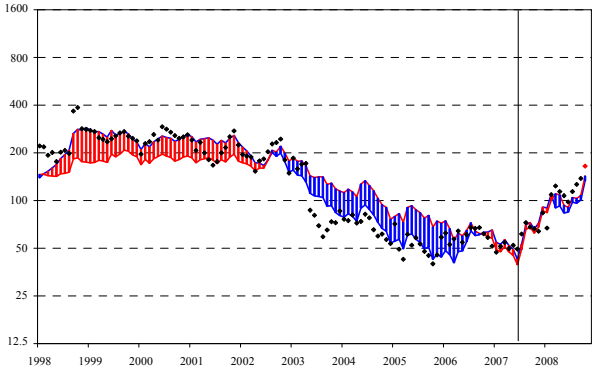
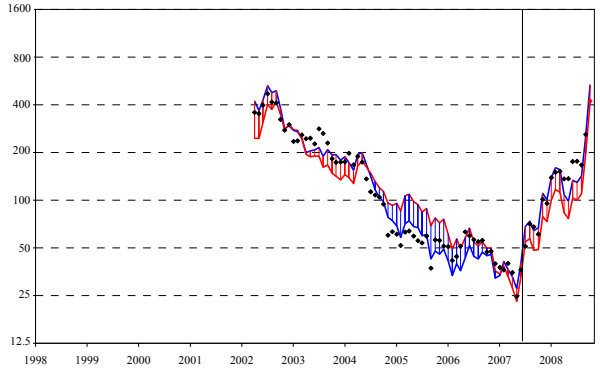
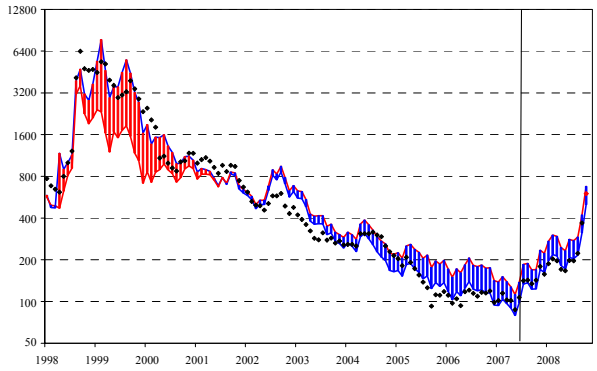


Chart 9. Actual versus modelled spreads (continued)

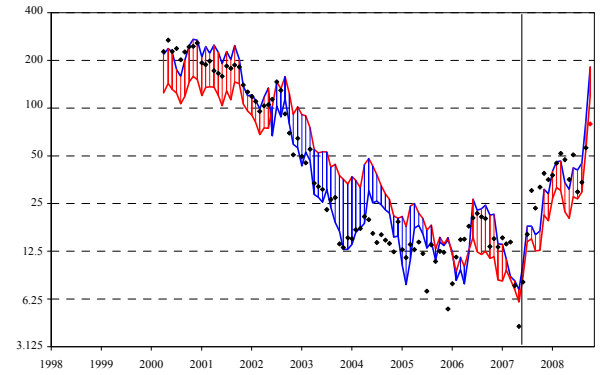
Romania



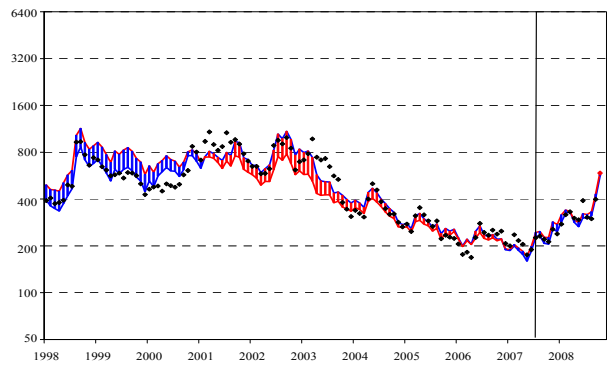
Russia



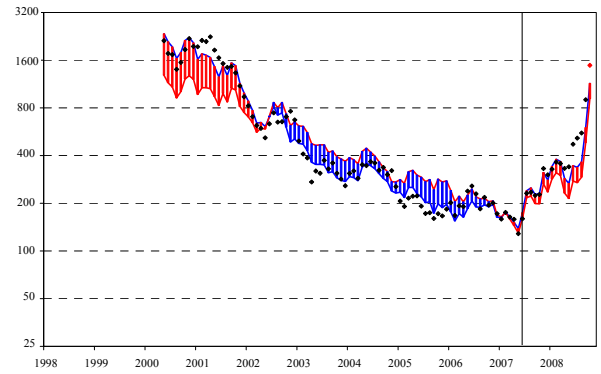
Slovakia



Turkey



Ukraine



South Africa

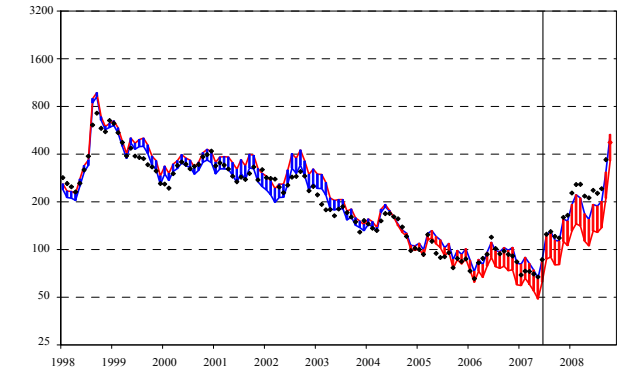
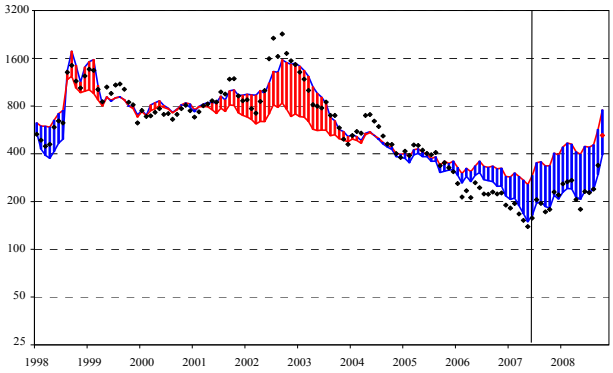


Chart 9. Actual versus modelled spreads (continued)

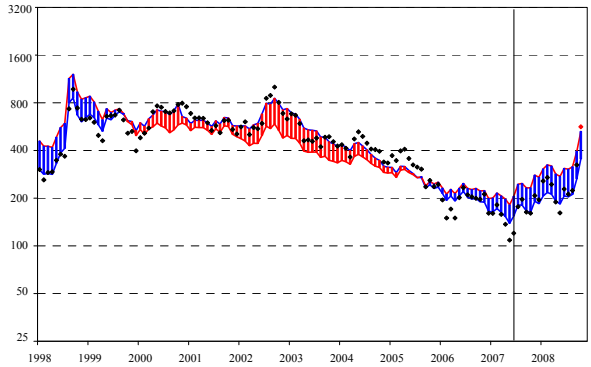
Latin America

Common factor + macro variables ◆ Actual spread Common factor

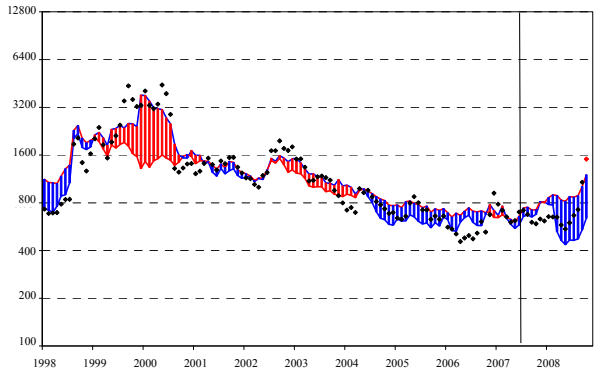
Brazil



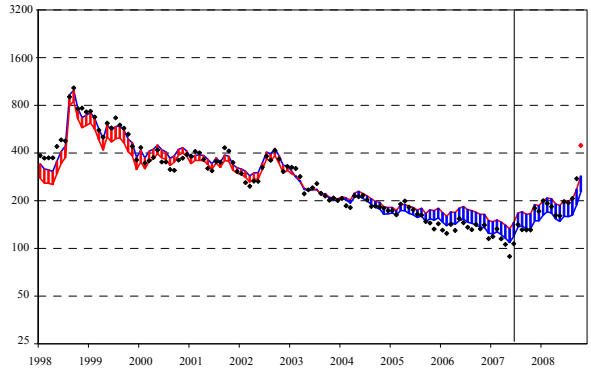
Colombia



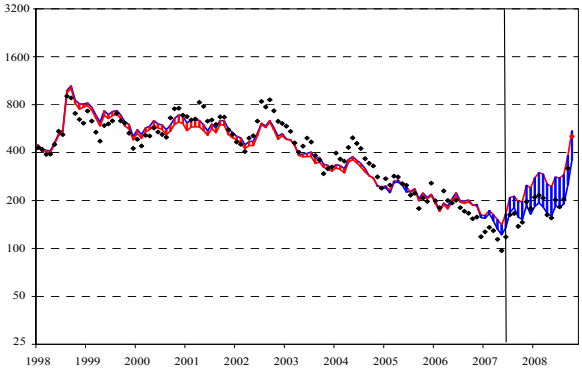
Ecuador



Mexico



Peru



Venezuela

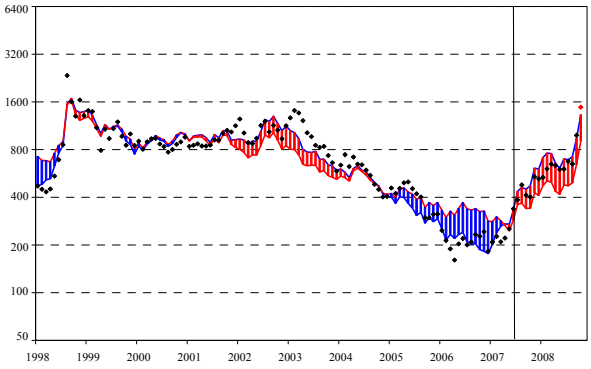
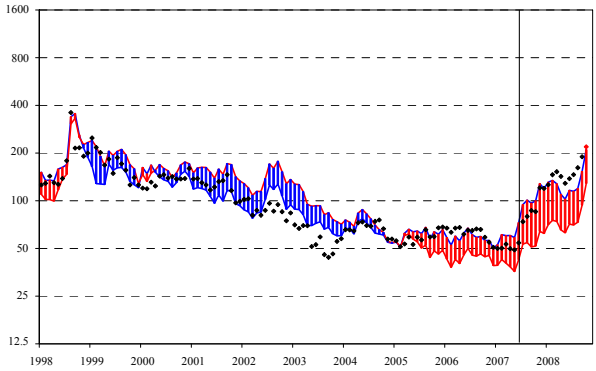


Chart 9. Actual versus modelled spreads (continued)

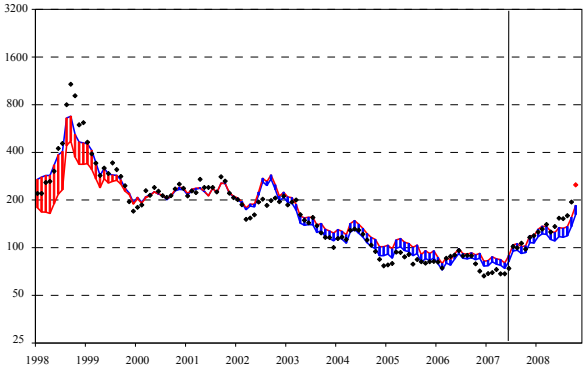
Asia

Common factor + macro variables ◆ Actual spread Common factor

China



Malaysia



Philippines

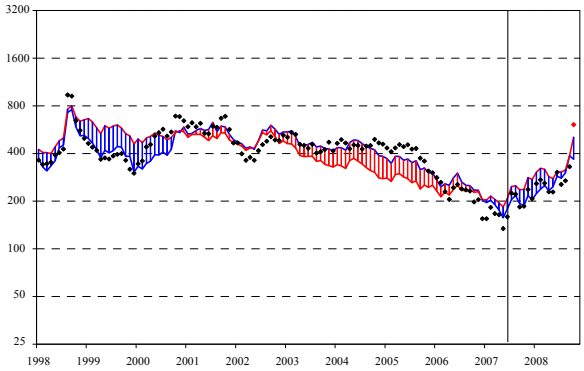
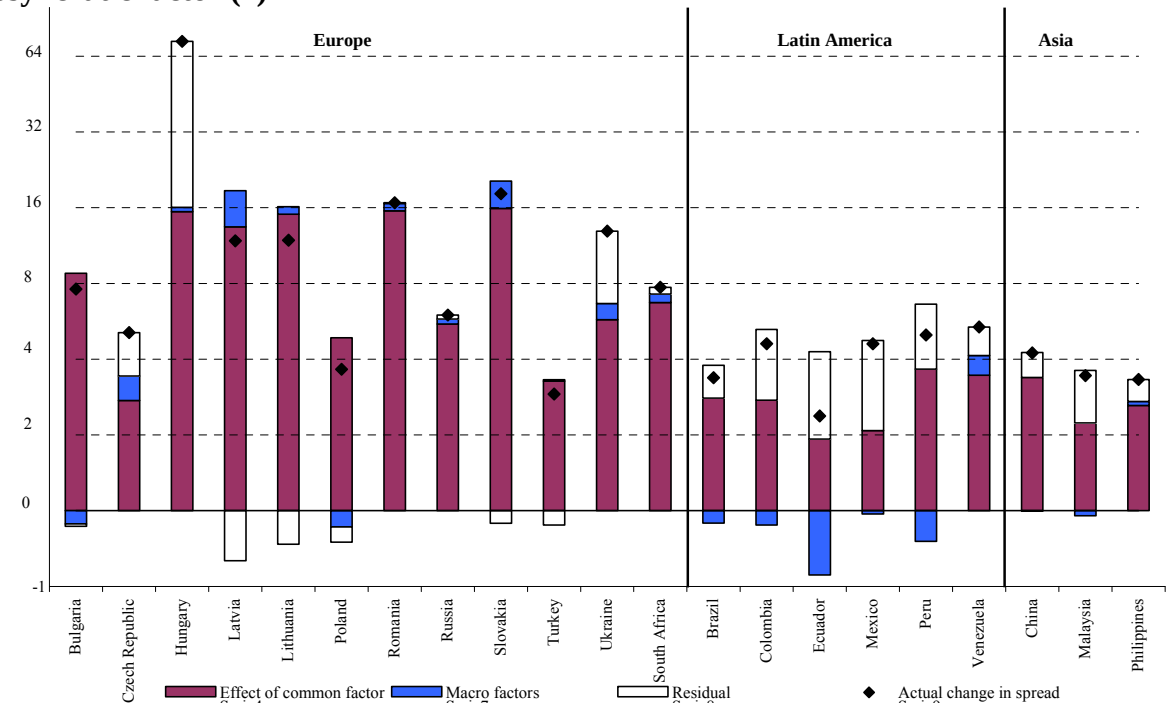


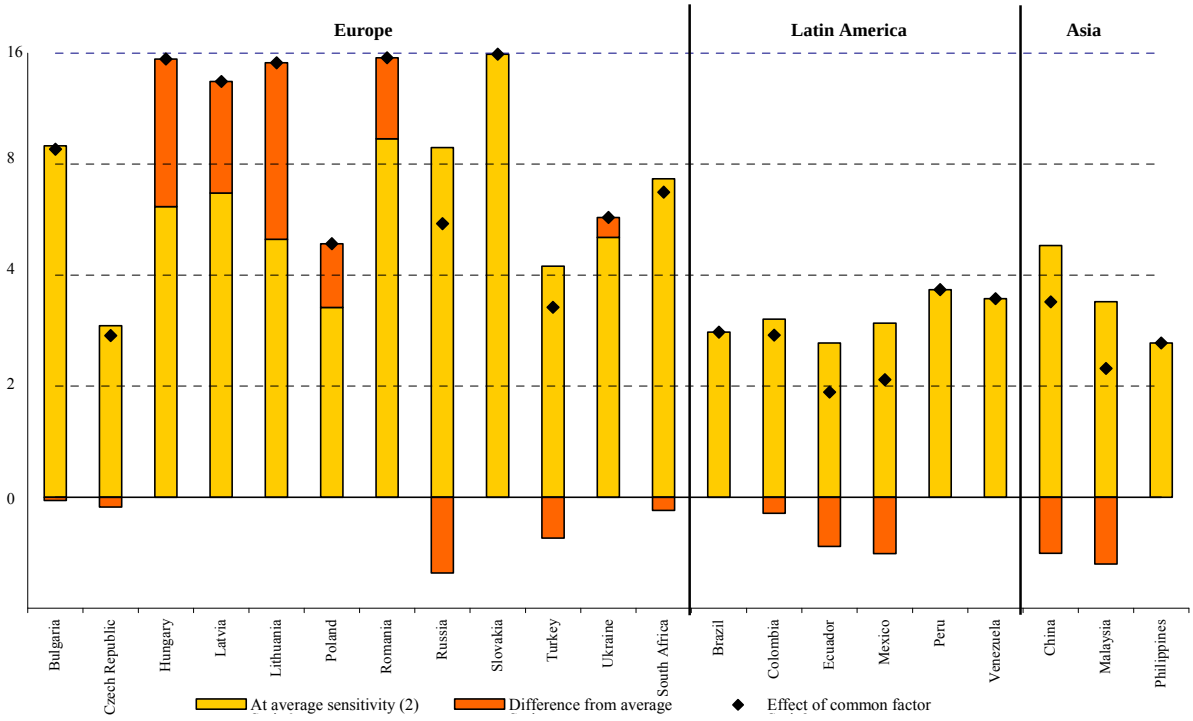
Chart 10. Decomposition of changes in EME spreads during the turmoil: common vs. idiosyncratic factor (1)



Source: Authors' calculations.

(1) The numbers represent differences in logs. The scale of the vertical axis indicates how many times the spread has increased between June 2007 and October 2008.

Chart 11. Decomposition of the effect of the common factor during the turmoil (1)



Source: Authors' calculations.

(1) The numbers represent differences in logs. The scale of the vertical axis indicates how many times the spread has increased between June 2007 and October 2008.

(2) Effect of the common factor that would have prevailed if sensitivity to it had been equal to the average over the whole sample.

Annex I: The common factor

The first step in factor analysis is to estimate the latent factors by calculating the eigenvalues associated with the correlation matrix of EME spreads. The number of significant common factors is then chosen by retaining as many as necessary to explain a significant share of the total correlation of the spread series. The sample of countries included in the factor analysis comprises Brazil, Bulgaria, China, Colombia, Ecuador, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa, Turkey and Venezuela, whose EMBIG spreads are available for the longest time span.[21] Data cover the period January 1998-June 2008 and are collected on a monthly basis in order to align the frequency of the financial series to that of the macroeconomic variables used in the second part of the analysis. Spreads are expressed in logs, a standard approach in the relevant literature.

We find that a single common factor captures a large share of the co-variation among the spreads of the countries included in the sample (**Table A1**). This common factor, despite not having a precise economic meaning, can be considered a determinant of the variability of EME sovereign yield differentials that reflects international economic and financial developments, rather than individual country developments. A preliminary confirmation of this hypothesis is provided by the high unconditional correlation between the common factor and a number of financial variables, such as the level of US long-term interest rates, the slope of the US yield curve, global stock market indices, and the VIX index, which can be taken as a measure of international investors' appetite for risk (**Table A2**). A more formal econometric procedure[22] confirms that a significant relationship exists between the common factor, the VIX index, and an index of the price of commodities (**Table A3**).

[21] The results of the factor analysis are robust to a change in the sample of countries and in the time span. The common factor has been recalculated adding other countries with shorter EMBIG series (i.e. Hungary and South Africa), or countries for which an EMBIG series is not available. In these cases (i.e. Latvia, Lithuania, Ukraine, Slovakia), spreads are calculated on a single ten-year sovereign bond. In all these cases, the pattern of the estimated common factor remains basically the same.

[22] The estimate is made using the fully-modified OLS (FM-OLS) developed by Phillips and Hansen (1990) to address the problem of endogeneity and non-stationarity of the variables.

Table A1. Results of factor analysis
(monthly observations; Jan. 1998- Jun. 2008)

Country	Factor loading	Uniqueness	Communality	Country	Factor loading	Uniqueness	Communality
Brazil	0.90	0.19	0.81	Peru	0.95	0.10	0.90
Bulgaria	0.96	0.09	0.91	Philippines	0.77	0.41	0.59
China	0.77	0.41	0.59	Poland	0.93	0.14	0.86
Colombia	0.90	0.20	0.80	Russia	0.93	0.13	0.87
Ecuador	0.80	0.37	0.63	South Africa	0.95	0.09	0.91
Malaysia	0.92	0.15	0.85	Turkey	0.89	0.20	0.80
Mexico	0.96	0.07	0.93	Venezuela	0.90	0.19	0.81
Average	*0.90*	*0.20*	*0.80*				

Table A2. Correlation between the common factor and global financial conditions

US ten-year Treasury yield	0.39 (*)
US three-month Treasury yield	0.06
Slope yield curve [23]	0.15
VIX Index	0.74 (*)
S&P 500	-0.32
FTSE 100	-0.09
Nasdaq	-0.07
Commodities	-0.85 (*)

Note: yields on ten-year and three-month Treasuries are expressed in levels; all other variables are expressed in logs.
(*) Significantly different from zero at the 5 per cent level.

Table A3. Fully modified OLS estimates: the common factor
(dependent variable: common factor; estimation period Jan. 1998-Jun. 2008; monthly data)

Regressor	Coefficient	Standard error	*t*-statistics	P-value
Constant	1.35	1.27	1.06	0.29
VIX Index	1.61	0.22	7.15	0.00
Commodities	-1.21	0.15	-7.78	0.00

Note: asymptotic standard errors; the FM-OLS estimates have been calculated using Bartlett weights with truncation lag k=6; we have also performed the same estimation procedure with different lag structures (i.e. with k=1 and k=12), obtaining very similar results (available from the authors upon request).

[23] The slope of the yield curve is calculated as the difference between the daily yields on ten-year and three-month Treasuries. It is often used as a proxy for expected future growth: an increase in the slope of the yield curve is, in fact, associated with more optimistic expectations from international investors.

Annex II: Idiosyncratic factors affecting EME spreads

(dependent variable: log of spreads; monthly observations)

	Country	Macroeconomic fundamentals
America	Brazil	reserves over short-term debt (-); government net debt over GDP (+); primary balance over GDP (-); interest rates (+)
	Colombia	government net debt over GDP (+)
	Ecuador	real GDP growth rate (-); reserves over GDP (-)
	Mexico	government net debt over GDP (+);
	Peru	reserves over GDP (-)
	Venezuela	reserves over total external debt (-); primary balance over GDP (-)
Asia	China	real GDP growth rate (-); short-term debt over total external debt (+); interest rate (+)
	Malaysia	real GDP growth rate (-); interest rates (+)
	Philippines	exchange rate (+); inflation rate (+)
Europe and others	Bulgaria	reserves over short-term debt (-); total external debt over GDP (+)
	Czech Republic	government net debt over GDP (+)
	Hungary	government net debt over GDP (+); exchange rate (+); short-term debt over total external debt (+)
	Latvia	real GDP growth rate (-); current account balance over GDP (-)
	Lithuania	current account balance over GDP (-); interest rate (+); short-term debt over GDP (+)
	Poland	interests payments over total external debt (+); current account balance over GDP (-)
	Romania	real GDP growth rate (-); primary balance over GDP (-); interest rates (+);
	Russia	total external debt over GDP (+); interest rates (+)
	Slovakia	reserves over GDP (-); current account balance over GDP (-)
	South Africa	short-term debt over GDP (+); current account balance over GDP (-)
	Turkey	reserves over total external debt (-); exchange rate (+); primary balance over GDP (-)
	Ukraine	short-term debt over GDP (+); government net debt over GDP (+); primary balance over GDP (-)

Annex III: The vulnerability indicator

The vulnerability indicator *IND* was set up according to the following procedure.

The first step was the choice of the variables needed to build the indicator: we relied on a set of six variables which, based on the economic literature, can be expected to capture a country's vulnerability to external financial shocks. On the one side, the 'good' variables, the increment of which exerts a positive (i.e. decreasing) effect on EME spreads: international reserves, current account balance and primary budget balance, all scaled by GDP. On the other side, the 'bad' variables, the increment of which exerts a negative (i.e. increasing) effect on EME spreads: total external debt, public debt and short-term debt, all scaled by GDP.

The second step consists in the choice of a method to combine together the macroeconomic variables: for each country, the vulnerability indicator is made up in the same way, by taking the simple average of the standardized values of these six variables. More precisely, each of the variables (X_j) has been normalized by its own range of variation so as to obtain a new series (x_j) ranging from 0 to 1.

Formally:

$$x_j = \left(X_j - \min X_j\right) / \left(\max X_j - \min X_j\right)$$

The transformed variables have been synthesized into a single index by calculating a simple average. To make the 'bad' variables consistent with the 'good' ones they have been standardized using the transformation (1-Index). By construction, an increase in the indicator signals an improvement in the above-mentioned fundamentals.

Table A4 shows the values, for each country, of the estimated parameters for the common factor and for the interaction between the vulnerability indicator and the common factor itself. The sign of the latter coefficient is negative as expected.

Chart A1 displays the evolution of the time-varying sensitivity to the common factor for the countries for which the interaction between the vulnerability indicator and the common factor turned out to be statistically significant. This sensitivity at time t has been calculated as follows:

$$\frac{\Delta s}{\Delta F} = \alpha_1 \cdot + \alpha_2 \cdot IND_t$$

Table A4. Interaction between the common factor and macroeconomic vulnerabilities

	Country	α_1	α_2
America	Brazil	0.39 (*)	-
	Colombia	0.59 (*)	-0.28 (**)
	Ecuador	0.23 (*)	-0.31 (***)
	Mexico	0.77 (*)	-0.34 (*)
	Peru	0.49 (*)	-
	Venezuela	0.47 (*)	-
Asia	China	0.80 (*)	-0.28 (***)
	Malaysia	0.93 (*)	-0.49 (*)
	Philippines	0.36 (*)	-
Europe	Bulgaria	1.27 (*)	-0.88 (***)
	Czech Rep.	0.71 (*)	-0.36 (*)
	Hungary	1.50 (*)	-0.78 (*)
	Latvia	3.65 (*)	-2.91 (*)
	Lithuania	1.84 (*)	-1.36 (*)
	Poland	0.89 (*)	-0.45 (*)
	Romania	1.43 (*)	-0.53 (*)
	Russia	1.37 (*)	-0.47 (*)
	Slovakia	1.10 (*)	-
	South Africa	0.94 (*)	-0.35 (***)
	Turkey	0.92 (*)	-0.34 (**)
	Ukraine	1.45 (*)	-0.77 (*)

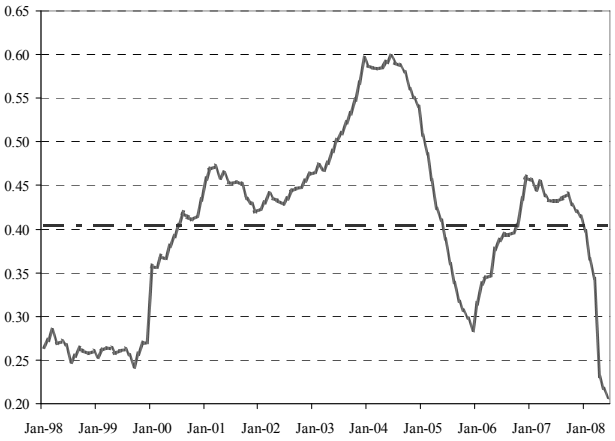
Source: Authors' calculations.
Note: (*) significant at 1 per cent s.l.; (**) significant at 5 per cent s.l.; (***) significant at 10 per cent s.l.

Chart A1. Time-varying sensitivity to global factors

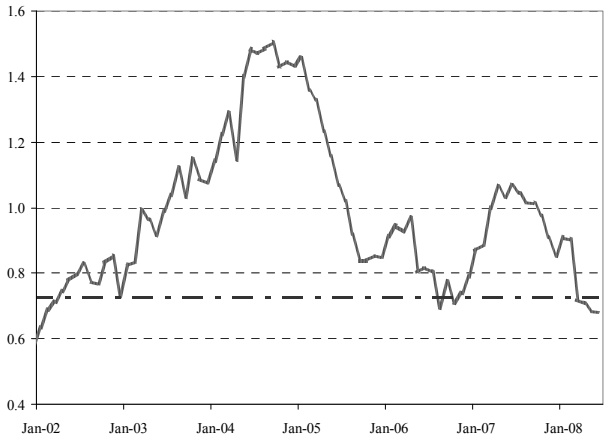
Emerging Europe

Bulgaria

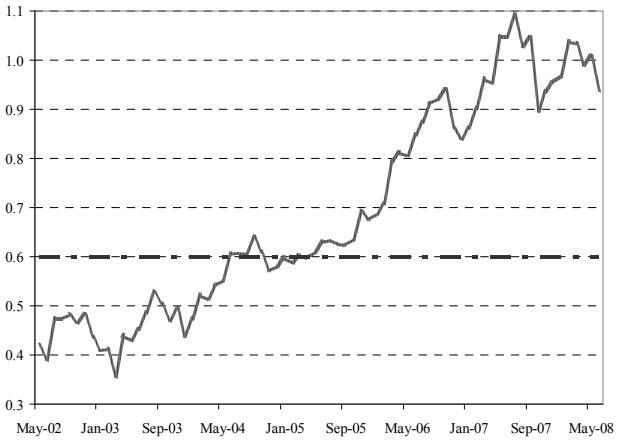
Czech Republic



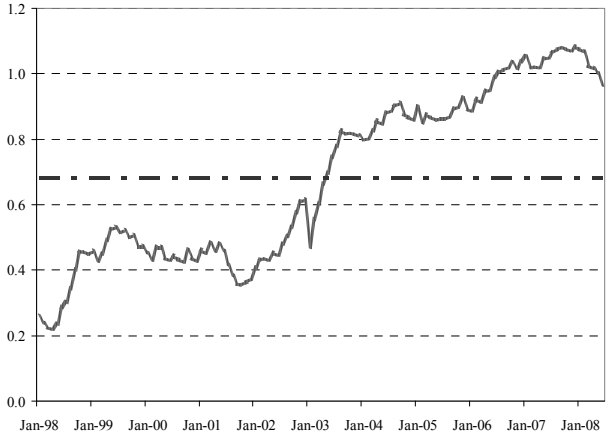
Latvia



Lithuania



Hungary



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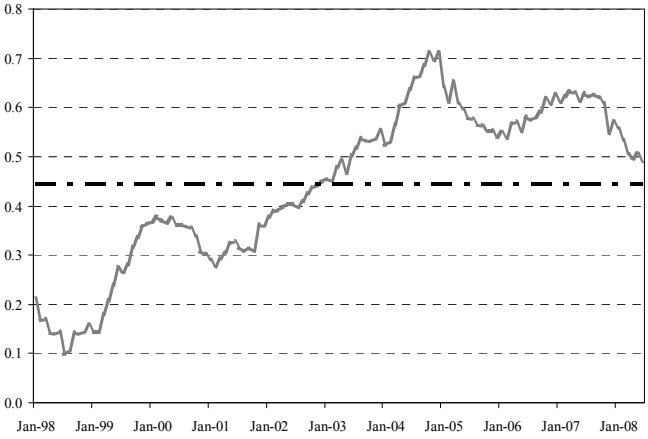
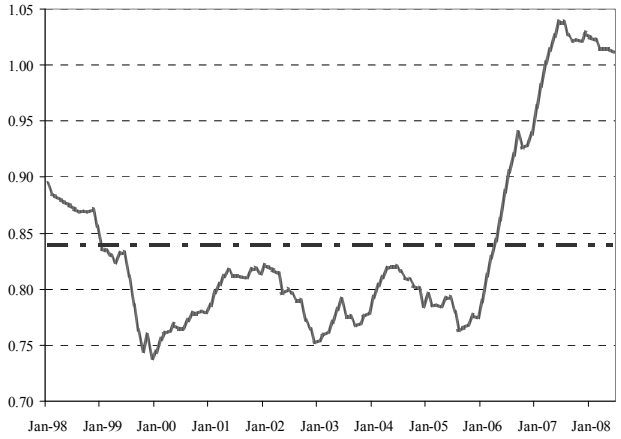
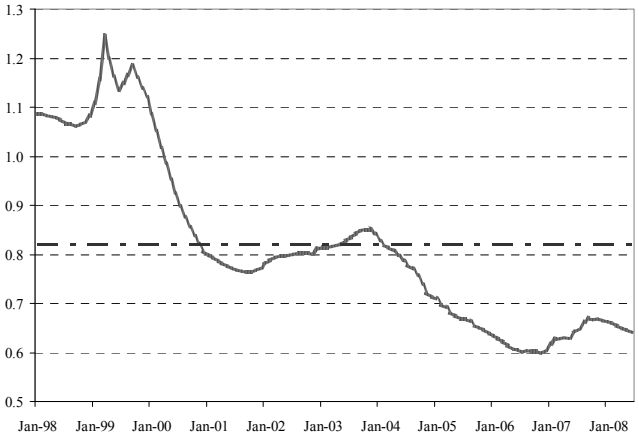


Chart A1. Time-varying sensitivity to global factors (continued)

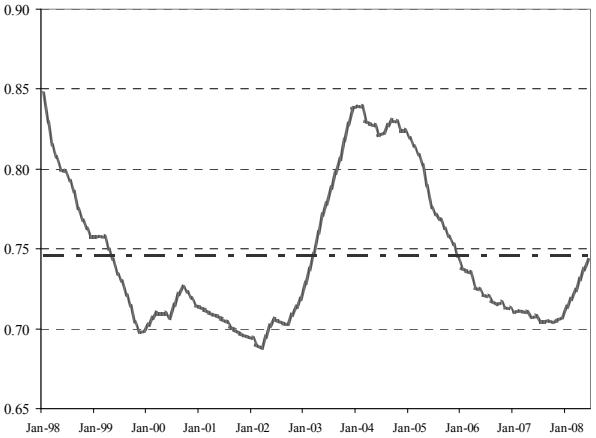
Romania



Russia



South Africa



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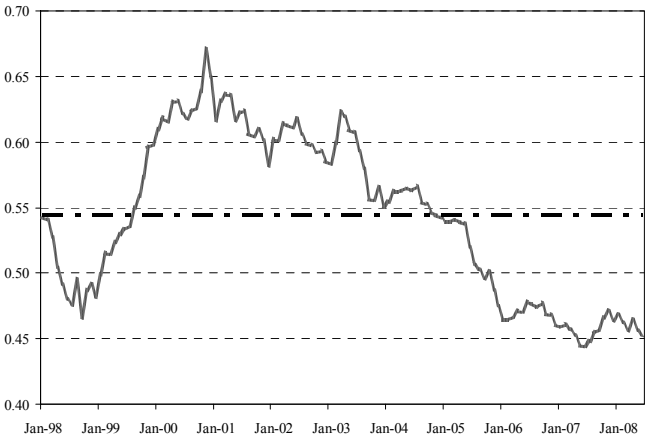


Ukraine

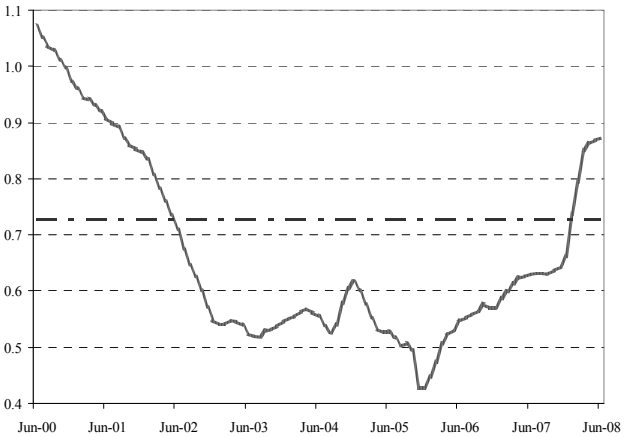
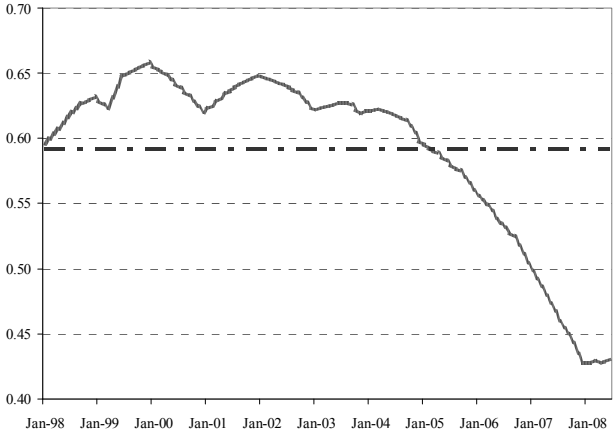


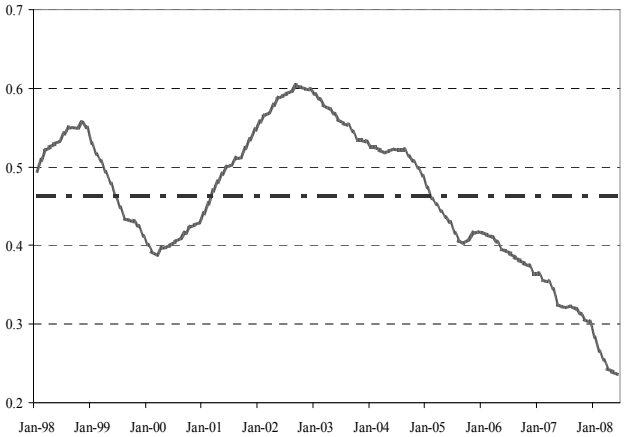
Chart A1. Time-varying sensitivity to global factors (continued)

Asia

China



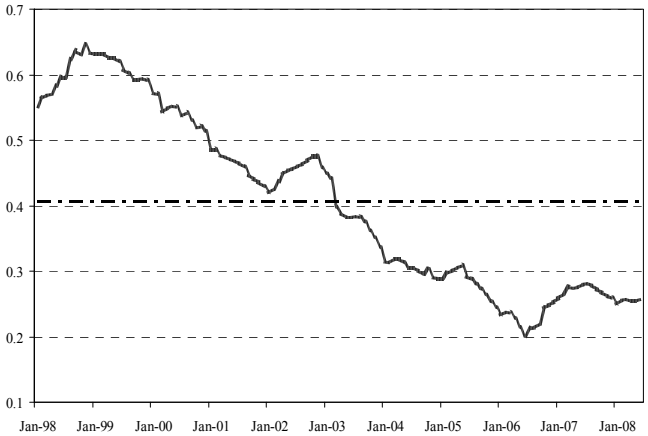
Malaysia



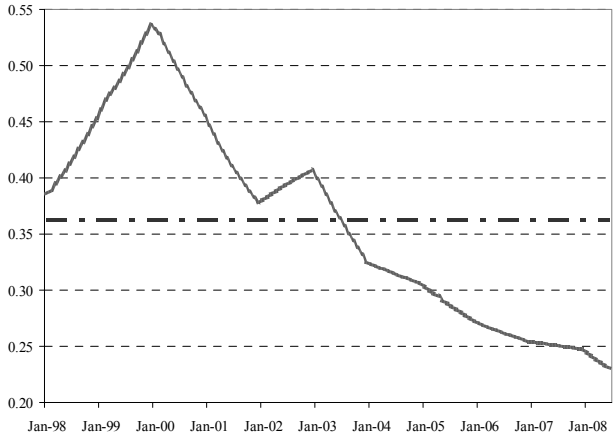
Latin America

Colombia

Mexico



Ecuador



Annex IV: Decomposition of change in spreads

In this annex, we outline how to decompose changes in spread. We start from s_0, the spread at the beginning of the period:

$$s_0 = \alpha_0 + \alpha_1 \cdot F_0 + \alpha_2 \cdot IND_0 \cdot F_0 + \alpha_3 \cdot Macro_0 + \varepsilon_0$$

where s is the spread, F is the common factor, IND is the vulnerability indicator, Macro are the macroeconomic variables (see Annex II) and ε is the error term. The coefficient on the common factor (α_1) and on the interaction term α_2 can be found in **Annex III** above.

Let us also assume that s_1 is the spread at the end of the period:

$$s_1 = \alpha_0 + \alpha_1 \cdot F_1 + \alpha_2 \cdot IND_1 \cdot F_1 + \alpha_3 \cdot Macro_1 + \varepsilon_1$$

The change in spread Δs can be therefore computed according to the following steps:

$$\Delta s = \alpha_1 \cdot \Delta F + \alpha_2 \cdot \left(IND_1 \cdot F_1 - IND_0 \cdot F_0\right) + \alpha_3 \cdot \Delta Macro + \Delta\varepsilon$$

If the interaction term is not significant, the second term cancels out and the formula becomes:

$$\Delta S = \alpha_1 \cdot \Delta F + \alpha_3 \cdot \Delta Macro + \Delta\varepsilon$$

In this case the first term represents the effect due to changes in the global financial conditions, captured by changes in the common factor. The second term and the error term may be thought of as idiosyncratic factors to the extent that the common factor is correctly measured.

If the interaction term is significant, the formula turns out to be slightly more elaborated:

$$\Delta S = \alpha_1 \cdot \Delta F + \alpha_2 \cdot \overline{IND} \cdot \Delta F + \alpha_2 \left(IND_1 \cdot F_1 - IND_0 \cdot F_0 - \Delta F \cdot \overline{IND}\right) + \alpha_3 \cdot \Delta Macro + \Delta\varepsilon =$$

$$= \underbrace{\Delta F \cdot \left(\alpha_1 + \alpha_2 \cdot \overline{IND}\right) + \alpha_2 \cdot \left[F_1 \cdot \left(IND_1 - \overline{IND}\right) - F_0 \cdot \left(IND_0 - \overline{IND}\right)\right]}_{1} + \underbrace{\alpha_3 \cdot \Delta Macro + \Delta\varepsilon}_{2} =$$

where $\overline{IND}$ is the average of the vulnerabilities indicator across the whole sample.

Changes in spread can therefore be decomposed into four addenda with the following meanings:

1 – **The first addendum represents the change in spread due to changes in the common factor and the interaction term**. The <u>first part</u> $\Delta F \cdot \left(\alpha_1 + \alpha_2 \cdot \overline{IND}\right)$ represents the effect due to average sensitivity to common shocks. The <u>second part</u> $\alpha_2 \cdot \left[F_1 \cdot \left(IND_1 - \overline{IND}\right) - F_0 \cdot \left(IND_0 - \overline{IND}\right)\right]$ accounts for the interaction between the common factor and the vulnerability index. For a given shock, the further away is the vulnerability index from its long-term average the greater this component will be.

2 – **The second and the third addendum represent the change in spread due to changes in idiosyncratic components.**

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