What has made the financial crisis truly global?

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Abstract

Why has the current financial crisis spread so violently across countries and economic sectors? Could this global dimension have been foreseen, or are we observing a novel transmission pattern? Focusing on the transmission to about 450 industry equity portfolios across 64 countries, the paper finds that equity portfolios with a high degree of integration with the US market before the crisis were affected substantially more strongly than more segregated ones – and to this extent, the transmission is not unexpected. Moreover, the magnitude of country risk explains a significant share in the cross-sectional heterogeneity of the crisis response, which is found to be a rather novel feature of the current crisis and appears to be related to financial policies implemented during the crisis. By contrast, risks at the micro level related to financial constraints do not seem to have played a major role in the global transmission of the crisis. Overall, the result that macro country risk dwarfed micro, firm-level risk as a global transmission channel of the crisis underlines the importance of macroprudential analysis for closer surveillance of such risks, both at a country level and at a global level.

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1. Introduction

The current financial crisis is arguably the first truly major global crisis since the Great Depression of 1929-32. While the current crisis has initially had its origin in the United States in a relatively small segment of the lending market (the sub-prime mortgage market), it has rapidly spread across virtually all economies, both advanced and emerging, as well as across economic sectors. Such a global transmission occurred despite the fact that firms, including financial institutions in many economies, had been less leveraged than firms in the United States. Nevertheless, the transmission of the crisis in financial markets across countries and sectors has been tremendous, with many countries experiencing sharper drops in asset prices and larger rises in credit spreads than the United States.

What are the factors that explain why the crisis has become truly global in nature and has spread so violently across countries and economic sectors? Has the transmission process been one that could have been foreseen, e.g. by studying the prior degree of integration of financial markets with the US, or have we observed a novel transmission pattern? This paper focuses on the global transmission of the 2007-2009 crisis across equity markets. To that end, it starts by presenting several stylized facts about the transmission of the crisis across equity markets in 64 countries and 10 industry sectors (or about 450 country-sector portfolios), covering more than 85% of world equity market capitalization.

A first striking characteristic which we note is that despite the large decline in world stock markets – of around 40-50% between 7 August 2007 and end-March 2009 – the crisis did not spread indiscriminately across countries and sectors. In fact, the dispersion in equity returns – measured e.g. as the standard deviation of weekly, monthly or quarterly returns – across our sample of about 450 country-sector portfolios increased sharply during the crisis, in particular in 2008, which points to higher discrimination by investors across equity portfolios.

If the crisis did not spread indiscriminately, what then have been the channels of transmission? There are at least three sets of explanations that are frequently mentioned as potential factors. A first factor is the need of investors to reduce aggregate risk, or what has been be called a "global de-leveraging" process, which has lead to a flight to safe assets. There has indeed been strong evidence of a substantial shift across asset classes, out of equities and into government bonds, in particular into US treasuries, during the crisis. The key issue here is what type of risk investors try to reduce. If investors focus on reducing macroeconomic risks, or country risk, which may be closely related to macroeconomic policies and fundamentals, this would imply that countries with weaker fundamentals have been more severely affected via capital outflows and equity price declines during the crisis.

A second, and related factor often emphasized for the transmission of the crisis outside the United States is the reduction of risk at the micro, or firm level, where investors shed assets of firms that are highly leveraged or considered strongly exposed to the credit crunch. Apart from the financial leveraging of firms, such risk has been linked to the presence of a global "liquidity squeeze", in which many non-US firms are financially constrained and face a shortage of liquidity, either in domestic currency or in US dollars, thereby suffering strongly from the turn in the credit cycle. In fact, this has been one of the main rationales for the Federal Reserve to extend US dollar swap arrangements to a number of (both advanced and emerging) countries since December 2007.

A third potential factor is what has been called a "retrenchment" or "repatriation" hypothesis, which abstracts from the role of risk de-leveraging either at the macro level or the micro level. According to this hypothesis, a central reason for the massive repatriation of capital to the United States observed in 2008 was the exploding demand of US financial institutions for liquid assets and the needs of fund managers for cash in the face of significantly rising

redemptions (the so-called "flight to liquidity"). Thus, this channel may have affected particularly those countries and firms with substantial financial integration with US markets, independent of their underlying level of risk.

The paper tries to shed light on these three hypotheses by studying the transmission of the crisis in equity markets, and by testing in particular why the equity market response has been so heterogeneous across countries and sectors.

The paper first measures the time-varying integration of our country-sector portfolios with the US market. To do so, we estimate CAPM and Fama-French (1992) models – similar to Bekaert, Hodrick and Zhang (2008) – for each of these portfolios to extract time-varying factor exposures to US equity markets (US beta). What is striking is that these betas have been stable and even slightly declined, on average, during the crisis. This means that despite the magnitude of the equity market correction, the sensitivity of foreign markets to US markets has remained by and large the same. By contrast, the fact that the largest increase in return dispersion has occurred across countries, rather than within countries and across sectors, suggests that country-specific characteristics (i.e. macro or country risk) might be particularly important for understanding the global transmission of the crisis.

The second part of the paper formally tests for the importance of these three potential factors of the crisis transmission, i.e. country risk, sector level-risk (firms' financial constraints) and integration with US markets. As a first main result, the degree of integration with the US market (US beta) has played a major role in the global equity market transmission of the crisis. Returns of country-sector portfolios with a high sensitivity to US markets have risen faster before the crisis but also declined significantly more during the crisis. This effect is economically meaningful, with portfolios with an above-average beta declining by about 10 percentage points more during the crisis than portfolios with a lower-than-average beta. Insofar, there has been a part of the transmission that could have been foreseeable before the crisis. However, this factor can only partly explain the extent to which the crisis has spread.

Our second main finding is that much of the global transmission of the financial crisis is related to country risk, and in particular to the strength of countries' macroeconomic fundamentals. Controlling for time-varying financial integration – i.e. US betas – it turns out that countries with in particular a strong current account, high FX reserves, or a good sovereign rating have fared significantly better in terms of equity market performance during the crisis. And these effects are substantial: equity portfolios declined by 10-15 percentage points, or overall by one third less in countries with an above-average current account position, FX reserves-to GDP ratio and sovereign rating. A striking finding of the analysis is that while countries with relatively strong macroeconomic fundamentals and low country risk fared worse in the years before the crisis, they were much less adversely affected during the crisis. By contrast, there is little evidence that risk at the micro level related to firms' financial constraints help explain the differences in equity market performance across countries and industry sectors. These findings prove robust to a number of extensions and sensitivity tests.

Overall, these first two results suggest that financial integration with US markets and country risk played a central role in making the crisis global, and thereby give support to the hypotheses of a "repatriation" of capital to the US and to that of a global de-leveraging and reduction in country risk. By contrast, the absence of evidence in the data for the role of financial constraints at the firm level suggest that the second potential channel of transmission, that of a global liquidity squeeze was much less important.

As a third key result, we find tentative evidence that the transmission mechanism has been fundamentally different in the current financial crisis than in past periods and crises. To get at this issue, we first compare the current financial crisis with the TMT (technology, media, telecommunications) boom-bust cycle of the late 1990s and early 2000s. Both the current

crisis and the TMT boom-bust are remarkably similar with regard to the magnitude of equity market movements, as well as to their peaks and troughs. We find that while country risk played a key role in the global transmission of the current crisis, it seems to have been irrelevant in explaining the global transmission of the TMT boom and bust. Moreover, cross-country equity return differentials do not seem to be systematically related to country risk also in more tranquil periods. This suggests that the current crisis indeed seems to be special as country risk has been substantially more important in the global transmission process.

One potential explanation for why macro risk at the country level has become so important during the current crisis is the role of the substantial policy responses to the crisis. Financial policies (foremost debt and deposit guarantees and capital injections), in essence, have both transferred risk on a massive scale from individual firms (not just in the financial sector) to governments, as well as reduced the overall risk for individual firms. We find evidence consistent with this second mechanism in that financial policies have helped shield and insulate firms to some extent from the impact of the crisis and from country risk. In fact, the magnitude is sizeable with equity returns declining by about 10 percentage points less for portfolios in countries where financial policies were introduced during the crisis.

A potential shortcoming of our approach so far is that it analyses the global transmission of the financial crisis unconditionally, i.e. without identifying specific shocks that may underlie the crisis, which makes it hard to identify the direction of causality in the chain of the transmission process. Although few would argue with the fact that the origin of the current financial crisis lay in the United States, one reason why different country-sector portfolios evolved so differently may not only have to do with differences in fundamentals and exposure, but could be due to the occurrence of simultaneous – but idiosyncratic – shocks faced by individual firms, sectors or countries.

The final part of the paper therefore extends the analysis to a conditional one, i.e. it uses a set of well-identified US shocks and investigates how these shocks (which we consider as common shocks to all the country-sector portfolios in our sample) have been transmitted to equity markets at a daily frequency, which also allows us to shed further light on causality. We use important events during the crisis, such as the collapses of Lehman Brothers or Bear Stearns, or important policy decisions such as the initial refusal of US Congress to ratify the TARP program. Moreover, we investigate the transmission of US macroeconomic announcements to equity markets. The advantage of using such US macro news is that it allows for a comparison of the transmission of a given, identically-sized shock before the crisis versus during the crisis.

This conditional analysis reveals that equity markets became substantially more sensitive to US macroeconomic news during the financial crisis, with these shocks exerting a three to four times stronger effect on non-US equity markets relative to before the crisis. Similarly US equity returns have become equally more sensitive to macroeconomic news, which is consistent with our previous finding that market integration (betas) with US markets had remained relatively stable during the crisis.

Even more importantly, using a difference-in-difference specification, we find that the magnitude of the transmission of shocks across borders and sectors is mostly related to the size of a country-sector portfolio's beta and much less to differences in country risk. Overall, this suggests that while the transmission of US shocks is partly explained by the integration with US markets (consistent with the "retrenchment" or "repatriation" hypothesis), idiosyncratic country shocks likely explain the larger decline in equity markets in countries with weak policies and fundamentals.

The paper is related to various papers in the literature. It relates to the still small but rapidly growing literature on the 2007-2009 financial crisis, which has so far largely focused on the

US, on policy responses or on country experiences (e.g. Calomiris 2008, Taylor 2009). An important paper related to our approach is the one by Tong and Wei (2008), who analyze the role of financial constraints and demand factors of firms for the transmission of the subprime crisis across equity returns of firms within the United States. The literature on the global transmission of the crisis has been far more scant, with the exception of the IMF (2009) which looks at the transmission of financial stress (measured by a synthetic index) from advanced to 18 emerging economies with annual data from the early 1990s to 2008, while Fratzscher (2009) analyses the global transmission of US shocks to FX markets for a broad set of advanced and emerging market economies. By contrast, there is a large and prominent literature on the global transmission of past financial crises, with a strong interest in the role of contagion and related channels (e.g. Bae et al. 2003, Karolyi 2003, De Gregorio and Valdes, 2001, Dungey et al. 2004). Part of this debate focuses on what constitutes contagion and how one can identify and distinguish it from other transmission channels (e.g. Forbes and Rigobon 2002, Bekaert, Harvey and Ng 2005) More generally, this literature has focused on the pattern of global financial market integration, in particular also of emerging markets which had traditionally been less integrated in the past (Bekaert and Harvey 1995 and 2000).

A different strand of the literature has focused more specifically on global financial linkages and the transmission channels for various types of shocks. An influential study is Forbes and Chinn (2004), who show that financial linkages and trade account for part of cross-country equity returns. Hausman and Wongswan (2006), Wongswan (2006), Fratzscher (2008) and Ammer, Vega and Wongswan (2009) analyze the transmission in particular of US monetary policy shocks to equity markets, and in part to FX markets globally. The paper is linked in various ways to these three different strands of the literature, by focusing on the current financial crisis yet by analyzing global linkages and the transmission of shocks and the underlying transmission channels.

The paper is organized as follows. The next section discusses the data and provides some stylized facts about the evolution of equity market integration with the US market and exposure over time. Section 3 then presents the empirical model and results, together with various extensions and robustness checks. The role of financial policies for this transmission process is investigated in section 4, while Section 5 then turns to the conditional analysis about the transmission of shocks to equity markets and the underlying transmission channels. Section 6 summarizes the findings and concludes.

2. Data, market integration and a few stylized facts

This section outlines the data coverage and definitions, presents a few stylized facts and provides a measure for the time-varying integration of global equity portfolios with US markets. It concludes by discussing the identification and measurement of the US shocks for the conditional analysis of section 4.

2.1 Portfolio definitions and equity market movements during the current crisis

A first issue is the country coverage and equity market data used. As the objective is to test for the global transmission of the financial crisis, we use a broad set of 64 countries (other than the United States, which are not included in our analysis of cross-country transmission patterns) that includes not only most of the advanced economies, but also emerging market economies (EMEs) and a few developing countries. Table 1 lists the country coverage by region. The objective of analyzing the global transmission of the crisis implies that we would like to include stocks of firms that are traded frequently and for which also data on firm-specific characteristics are available. Hence we include only those firms in the analysis that

are part of the main equity market index in the respective country, as shown in Table 1. This comprises about 2,000 firms in total, for which we have extracted daily equity returns in local currency.[1]

Table 1

From the firm-level data we construct country-sector portfolios, using the Bloomberg classification that allocates firms into 10 broad industry sectors. This yields in total 455 country-industry or country-sector portfolios. Not every of the 64 countries in the sample has therefore 10 country-sector portfolios as not all countries have firms in each of the 10 sectors in their main stock market index. These portfolios are value-weighted, so that each firm is weighted according to its relative market capitalization in its respective portfolio. While the number of firms included in a portfolio can be small (and indeed, for some of the smallest countries with a low number of listed firms, a single firm may represent an entire sector), our intention is to include only relatively large firms in each country that are traded frequently and for which we have reliable data.

As to the current financial crisis, we define the starting point of the crisis as 7 August 2007, when equity markets initially fell and central banks started intervening for the first time to provide liquidity to financial markets. The last observation in our dataset is 31 March 2009. An alternative crisis definition is to start with the collapse of Bear Stearns in March 2008, or alternatively with the bankruptcy of Lehman Brothers on 15 September 2009. Our preferred time window is the longer one starting on 7 August 2007, though our analysis below also looks at such shorter crisis windows.

Figures 1 – 2

Figures 1 – 2 provide a few stylized facts about equity market developments over the past 15 years, going back to 1995. Using overall MSCI equity indices, Figure 1 plots cumulated equity market returns relative to the value of the respective indices at the start of the current crisis on 7 August 2007. What is striking from Figure 1 is that the boom-bust cycle surrounding the current crisis is not so different from the TMT boom-bust cycle of the late 1990s and early 2000s. In fact, the equity market peak reached in mid-2007 was at a similar level to the one reached at the height of the TMT boom in early 2000. Similarly, the trough of the subsequent equity market collapse in early 2009 was similar to the level reached at the end of the TMT boom-bust cycle in early 2003. There are of course also several important differences, one of them being the sharper and more rapid decline in equity markets in the current crisis, in which the time from peak to trough (so far) has been only about 18 months, while it took about 30 months in the TMT cycle. In both cases, the equity market decline of about 50% from peak to trough has been enormous. Panel B of Figure 1 shows regional indices, underlining the differences in the equity market performance across regions.

Figure 2 shows quarterly, unweighted equity returns across the 455 country-sector portfolios in our sample. Panel A stresses the sharp decline in equity returns throughout 2008, and in particular in the third and fourth quarters of 2008. What is striking in Panel A is that return performances across the 455 portfolios have become substantially more diverse during the crisis. The return dispersion across the 455 portfolios – measured as the standard deviation across quarterly returns – has increased strongly during the current crisis, and even more so than during the 2000-2002 equity market decline. Panel B breaks down this dispersion across countries and within countries/across sectors. It indicates that the rise in dispersion has been

[1] The perspective of the analysis is therefore from a global perspective, rather than from the perspective of an individual e.g. US investor. Note that equity returns in US dollar terms have been even more negative during the crisis given that almost all currencies (bar the Japanese yen, and a few pagged currencies) depreciated against the US dollar; see Fratzscher (2009).

larger across countries, suggesting that determinants at the country level may be important – perhaps more important than those at the sector level – in explaining differences across equity market performances during the crisis.

2.2 Time-varying market integration during the current financial crisis

As discussed in the introduction, a potentially important determinant for the transmission of the crisis from the US to foreign markets is the degree of integration with US markets. Bekaert, Hodrick and Zhang (2008) compare the performance of various risk-based models with time-varying factor exposures (betas) in order not only to measure stock market co-movements, but in particular to model their time-variation. Following their approach, we take a standard CAPM as our benchmark model, in which expected excess returns $E_{t-1}(R_{i,t})$, US market returns R_t^{US} and regional market returns R_t^{RG} are the only relevant factors for the excess return of portfolio *i* at time *t*, $R_{i,t}$:

$$R_{i,t} = E_{t-1}(R_{i,t}) + \beta_{i,t}^{US} R_t^{US} + \beta_{i,t}^{RG} R_t^{RG} + e_{i,t} \quad (1)$$

As explained in section 2.1, portfolio returns $R_{i,t}$ as well as the US and regional indices are value-weighted. Following Bekaert, Hodrick and Zhang (2008), we estimate a regional return component which is orthogonal to that of US returns, by regressing each regional return on US returns and then using the residual of this regression as the regional factor in (1).

Moreover, we also follow their example in obtaining time-varying betas by estimating equation (1) with weekly data for six-month windows. Finally, one may add additional controls to the estimation of (1), as suggested e.g. by Fama and French (1992). However, we are here primarily interested in the time-varying factor loadings for the US market factor, and chose to include a value factor and a size factor for each portfolio directly in the subsequent estimation of the determinants of portfolio returns during the financial crisis. Adding such additional controls to equation (1) does not affect the time-varying factor loadings for the US market factor in any meaningful way.

Figures 3 – 5

Panel A of Figure 3 shows the time-varying US betas as well as their dispersion across all 455 country-sector portfolios, measured as the standard deviation of the factor loadings at each point in time. It reveals the general upward trend in integration of foreign markets with US markets. Interestingly, the average US beta across the 455 portfolios reaches its peak in 2006 and declines slightly during the financial crisis. A second intriguing finding is the drop in the dispersion in US betas across portfolios during the crisis, implying that differences in the sensitivity to US market movements across portfolios have decreased with the crisis. Figure 4 indicates that this decline is explained by a general convergence across all portfolio betas rather than by a few outlier portfolios. Moreover, Panel B of Figure 3 indicates that this decline in the dispersion is mainly explained by the lower dispersion of portfolios' US betas within countries, rather than across countries.

Panel A of Figure 5 compares the dispersion in US betas with the dispersion in the idiosyncratic component $e_{i,t}$ of equation (1). The interesting point to note is that while the dispersion of US betas across portfolios has declined somewhat, the dispersion in the idiosyncratic components has increased dramatically. Panel B of the figure provides the comparison of the dispersion in the idiosyncratic component with the dispersion in the part of portfolio returns $R_{i,t}$ which is explained by the time-varying integration with US markets, i.e. $(\hat{\beta}_{i,t}^{US} R_t^{US})$. The fact that both dispersions increase sharply during the crisis suggests that

both the integration with US markets as well as idiosyncratic, country-specific factors may help explain the heterogeneity of the portfolios' reaction during the current financial crisis. Before turning to formally test this hypothesis, we turn to outlining several other data and measurement issues.

2.3 Country-specific and portfolio-specific determinants

Turning to other data definitions, one issue is the measurement of country-specific and portfolio-specific characteristics and risks. We try to capture a broad set of macroeconomic fundamentals and policies that describe the overall performance of economies, and in particular their vulnerability to the financial crisis. Table 2 lists these variables, together with summary statistics and an indication of the data source. We use three overall, composite country risk indicators, using the International Country Risk Guide (ICRG) indices for overall country risk, for the economic country risk, and the financial country risk. The advantage of using such composite country risk indices is that they are comprehensive, capturing many dimensions of a country's fundamentals. Yet, as these risk indices are averages across a broad set of variables, it is impossible to say which of its components may explain the presence or absence of a transmission of the crisis. We therefore want to look specifically at individual macroeconomic variables that have been stressed in the literature as important for the external vulnerability of countries. These include the adequacy of foreign exchange reserves, the sovereign rating of countries, the current account position, the fiscal position, the level of interest rates, and inflation and unemployment rates,[2] with a large literature emphasizing the role of these fundamentals for countries' economic and financial vulnerability (e.g. Aizenman and Lee 2007, Chinn and Ito 2007)

Table 2

A second important dimension of a country's vulnerability to the financial crisis is its real and financial exposure to the rest of the world. The hypothesis is that firms in more open and integrated countries are more exposed to external shocks, and thereby may suffer more strongly, either because of sudden stops and capital flow reversals or because of a collapse in trade. We include trade openness (exports plus imports over GDP), and alternatively bilateral trade with the United States as proxies for trade exposure. For financial exposure, the two proxies included are financial openness (the sum of portfolio investment liabilities and assets over GDP), either globally or vis-à-vis the United States (sourced from the IMF's CPIS), as well as the depth of equity markets (market capitalization to GDP). There are a number of data caveats and limitations, which are discussed in detail elsewhere (see e.g. Lane and Milesi-Ferretti 2003, Warnock 2006, Daude and Fratzscher 2008), though these data definitions are widely used in the literature.

Turning to the portfolio-specific determinants, we are particularly interested in capturing two potential channels: whether a collapse in demand or the need for liquidity and financial constraints explain why sectors have been affected by the financial crisis; or whether it has been external exposures at the firm level which have made firms vulnerable to the transmission of the crisis. There is a large literature in monetary economics and in finance on how to measure the degree of financial constraints faced by firms (Kaplan & Zingales 1997; Rajan and Zingales, 1998; Cleary 1999; Almeida et al. 2004; Whited & Wu 2006). We follow this literature (Cleary 1999) and use a number of alternative variables as proxies for liquidity and solvency constraints, including the cash flows to assets ratio, current assets to liabilities ratio, long-term debt to assets ratio, sales growth and investment to fixed assets ratio.

[2] Foreign exchange reserves, the current account position, and the fiscal position are all measured relative to a country's GDP.

Considering now firm-level external exposure, the exchange rate exposure of firms has been stressed in the literature as an important reason for why firms' equity valuations are affected by foreign shocks (e.g. Adler and Dumas 1984, Dominguez and Tesar 2001 and 2006). The rationale is as follows: a firm is likely to be more strongly affected by a particular US shock and the resulting exchange rate change if it has a high external exposure, e.g. via trade or via external financial linkages. Following the methodology proposed by Dominguez and Tesar (2001), we proxy the exchange rate exposure of each portfolio to the United States by the sensitivity of its excess equity return at time *t*, $R_{i,t}$, to bilateral exchange rate changes vis-à-vis the US dollar, $\Delta s_{i,t}$, controlling in the estimation also for US equity returns R_t^{US}:

$$R_{i,t} = \delta_0 + \delta_i \Delta s_{i,t} + \kappa_i R_t^{US} + e_{i,t} \quad (2)$$

where the exchange rate exposure for each portfolio, estimated over the whole pre-crisis sample period 1 January 1995 to 6 August 2007, is measured as δ_i. For the estimation we use weekly data frequency. We also obtain a country-wide exchange rate exposure variable by taking the median across the different portfolio estimates in order to reduce the potential role of outliers among individual portfolios.

Another type of exposure, and one related closely to the credit channel, is a firm's exposure to changes in the cost of financing. Similar to the estimation proposed by Ammer, Vega and Wongswan (2009), we measure this channel as the interest rate exposure of individual portfolios to changes in domestic three-month interest rates, $\Delta r_{i,t}$, in the following way:

$$R_{i,t} = \eta_0 + \eta_i \Delta r_{i,t} + \kappa_i R_t^{US} + e_{i,t} \quad (3)$$

using weekly data frequency, in order to obtain portfolio-specific interest rate exposures η_i. Unfortunately, short-term interest rates at weekly frequencies are not available for all countries so that the sample size is more limited for this interest rate exposure variable.

2.4 Identification of common shocks before and during the crisis

As discussed above, a drawback of looking at equity market co-movements during the financial crisis is that it does not necessarily allow identifying the direction of causality in the transmission mechanism. Although few would argue with the fact that the origin of the current financial crisis lay in the United States, one reason why different country-sector portfolios evolved so differently may not only have to do with differences in fundamentals and exposure, but could be due to the occurrence of idiosyncratic shocks faced by individual firms, sectors or countries. The second part of the empirical analysis therefore focuses on the transmission of US shocks (which can be seen as common shocks to all countries in our study) to global equity markets.

Figure 6

We identify two sets of common shocks. A first set of shocks are specific US events during the financial crisis. We use the Bloomberg timeline, which lists all crisis-related events at a daily frequency. There are in total more than 400 events, for a crisis which so far has lasted less than 400 business days (note that there can be several events on a given day). In order to ensure that what we capture are really crisis-related, important events we focus quite narrowly

on six key events, which are important in terms of their market impact[3] (see Figure 6) and which can be identified cleanly as US-specific in nature. These are:

- 16 March 2008: Bear Stearns collapse and sale to JPMorgan
- 15 September 2008: Lehman Brothers declares bankruptcy
- 29 September 2008: U.S. House Rejects $700 Billion Financial-Rescue Plan
- 30 September 2008: FDIC Seeks Authority to Raise Deposit Insurance Limit
- 13 October 2008: US Treasury announces investment in 9 major US banks
- 23 March 2009: U.S. Treasury Announces $1 Trillion Plan to Buy Distressed Debt

While these are clearly very selective, the purpose here is not to capture as many shocks as possible, but merely to analyze how a given common shock is transmitted to global equity markets and the underlying transmission channels. To simplify the empirical analysis, we pool these six shocks into a single indicator variable taking the value $I_t = +1$ if the news is positive, and the value $I_t = -1$ if the news is negative. As a matter of fact, all events identified as positive triggered equity market rallies, whereas all negative news led to a stock market decline on that day.

A second set of common shocks are 10 US macroeconomic announcements, comprising real and financial indicators, as well as confidence indicators. More precisely, we use the unexpected or news component of each announcement, which is measured as the difference between the announced value and the expected value based on the median expectation expressed in Bloomberg surveys prior to the release.

Table 3

Table 3 provides an overview and some summary statistics for the 10 US macroeconomic types of news. The advantage of using such US macro "shocks" as proxies for common shocks is that not only can they be identified cleanly and separated from other shocks – in particular as we have a time series for all of them, with each announcement usually taking place once a month – but equally importantly, using these news we can gauge how a given shock has been transmitted before versus during the financial crisis, and thus whether the transmission process and the transmission channels have changed during the financial crisis.

There is by now a fairly large literature on analyzing how such macroeconomic announcements affect asset prices, both in the United States and globally. A detailed account of the construction of the news component of the announcements and their financial market effects are provided in Andersen et al. (2003), Ehrmann and Fratzscher (2004, 2005a and b), and Gürkaynak, Sack and Swanson (2005). The data source is Bloomberg, both for the announcements and for the surveys of market participants' expectations.

3. The role of country and sector risk in transmitting the crisis

We now turn to presenting the empirical results for how and why country-sector portfolios across the 64 countries in the sample have been affected differently by the financial crisis. The second part of the section then outlines various extensions to test for the robustness of the findings.

[3] The absolute US MSCI return on each of these days had to be larger than the 95th percentile of the return distribution between 1 January 2007 and the corresponding day.

3.1 Benchmark model and results

The first question we ask is about the determinants of equity returns across portfolios during the crisis, where we distinguish between a vector of country-specific and sector-level characteristics for each portfolio *i*, X_i, and a vector of controls, Z_i:

$$R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \varepsilon_i \quad (4)$$

Note that this is a pure cross-sectional estimation for the total cumulated return of each portfolio over the whole crisis period.[4] The vector of controls, Z_i, includes the factor loadings (US beta) for the integration of each country-sector portfolio with the US market as estimated from equation (1), averaged over the crisis period, as well as the other two Fama-French factors, i.e. firm size and book-to-market value.[5]

Tables 4 – 6

Table 4 shows the parameter estimates for a broad set of country-specific macroeconomic fundamentals and exposure variables, with each of the determinants included one at a time. As to the control vector Z_i, for brevity reasons the table only shows the time-varying factor loading (US beta). Moreover, the cross-sectional estimation of (4) is conducted not only for the current crisis period (panel A), but also for a pre-crisis period of 1 January 2005 – 6 August 2007 (panel B).

A first important finding is that financial integration with the US appears to matter: the "beta" variable indicates that portfolios with a high degree of co-movement with US markets have experienced sharper equity market declines during the crisis. However, more importantly what comes out strikingly clear from Table 4 is that there are other determinants for the global transmission processes than beta alone: equity portfolios in countries with stronger macroeconomic fundamentals experienced a better performance (i.e. less severe decline) during the current financial crisis than those with weaker macro fundamentals. In particular portfolios in countries with high FX reserves, a good sovereign rating and a strong current account position do significantly better during the crisis. This is also confirmed when looking at the broader composite country risk indices, and those focusing on economic or financial risk. As to the external exposure proxies, our results are somewhat weaker, but suggest that portfolios in financially open countries do worse, consistently with e.g. a repatriation motive affecting financially more open economies during the crisis.

A striking finding is also the switch in sign of many macroeconomic fundamentals from the period before the crisis (Panel B) to during the crisis (Panel A). What the findings overall suggest quite clearly is that portfolios in riskier countries with poorer fundamentals tended to benefit and experience relatively higher returns before the crisis, but were more adversely affected during the crisis. This is consistent with the hypothesis of an increase in leverage and risk-taking before the crisis, and with a sharp de-leveraging and retrenchment during the crisis. Table 5 shows the estimates when including various macroeconomic fundamentals and exposure variables simultaneously, which broadly confirms the results of Table 4.

[4] Recall that this estimation excludes the US portfolios, and that our benchmark specification of the crisis period ranges from 7 August 2007 till 31 March 2009.

[5] All determinants X_i and Z_i are included with contemporaneous values in this benchmark specification. This may pose the potential problem that country-specific and firm-specific characteristics may be affected by the crisis and hence not be exogenous. This issue will be addressed in the subsequent section, showing that the findings are largely unchanged when taking values of before the crisis for the various macroeconomic and firm-specific characteristics.

While the explanatory power of beta is not surprising, suggesting that there has been a predictable part of the crisis transmission to equity markets worldwide based on CAPM models, the role of macroeconomic fundamentals is less expected. To test whether this is a unique and novel feature of the current crisis, we have re-estimated identical models over a longer pre-crisis period, ranging from 1 January 1995 to 6 August 2007 (see Panel C, Table 6). Interestingly, macroeconomic fundamentals play virtually no role over this extended period, while the importance of beta is even strengthened.

Moreover, however, we have also repeated the analysis for another large equity market boom-bust cycle of the last 50 years, namely for the TMT bubble of the late 1990s and its collapse in the early 2000s. The results are provided in panels A and B of Table 6. What is intriguing is that almost none of the macroeconomic fundamentals seems capable to explain the transmission of the TMT bust to global equity market portfolios. This is suggestive that the two boom-bust cycles may have been fundamentally different in their transmission. In particular, the findings suggest that the central role of country risk is novel for the transmission process of the current financial crisis and was present neither in more tranquil periods in the past, nor in the last large equity market boom-bust cycle.

Table 7

Table 7 provides the corresponding results for the firm- or rather sector-specific determinants, such as external exposure of firms, financial constraints and demand conditions faced by firms in the various country-sector portfolios. There is weak evidence that such firm-specific determinants played a significant role during the crisis, while they seem to have been more relevant during the more tranquil periods before the crisis.

Figures 7 – 12

Figures 7 – 12 illustrate the economic relevance of the effects of these various determinants by showing the evolution of equity returns for different portfolio groups relative to the beginning of the financial crisis on 7 August 2007. Figure 7 for the financial integration with the US market indicates that portfolios with a US beta above average fell by 8 percentage points more during the crisis than those with a relatively low beta (45% versus 37%), while the former also rose by about 5 percentage points more from 1 January 2005 till the onset of the crisis. This is reflected in the switch of the coefficient sign in Tables 4-6 for this variable.

Figure 8 makes the same point for the various macroeconomic fundamentals, underlining that strong macro fundamentals and policies indeed helped shield equities in that country. For instance, portfolios in countries with a better than average current account position decline by 12 percentage points less than those with a weaker current account position. While there is obviously some positive correlation across fundamentals, Figure 9 nevertheless indicates that these differences are even larger when combining various macro fundamentals. Moreover, the figures also compellingly show that portfolios in countries with weaker fundamentals generally performed better before the crisis.

By contrast, Figure 10 shows that differences in financial risk at the firm level have little explanatory power in explaining the differences in responses of equity portfolios during the crisis, while they do have some explanatory power during the more tranquil pre-crisis period. Figure 11 provides scatterplots that show the correlation between betas and returns, and current accounts and returns at the individual portfolio level. Finally, Figure 12 gives the evolution of equity returns across four of the ten sectors. While equity returns were somewhat more dispersed across sectors before the crisis, they became less so during the crisis, with the exception of the financial sector firms, which suffered substantially more during the crisis.

In summary, the section has shown that the integration with US markets as well as country-specific, macroeconomic fundamentals are two key factors that explain the significant degree of the transmission of the crisis and why firms across countries have been affected so differently by the crisis. Moreover, it has also shown that the current crisis seems to be special, as country risk has been substantially more important in the global transmission process than in the past.

3.2 Extensions and robustness

There are a number of caveats and limitations to the benchmark analysis. In this sub-section, we present and discuss various extensions to check for the robustness of those results.

A first potentially important caveat is that the country-specific macroeconomic fundamentals could be highly correlated with the integration of countries with US markets, i.e. with the US beta from equation (1). A first point to note is that the estimations for Tables 4-6 all control for the time-varying US beta corresponding to each country-sector portfolio. However, to test more formally whether there is such a correlation, we regress each portfolio's US beta on the full set of macroeconomic fundamentals.[6] Table 8 shows that while there is some correlation between the US beta and a few of the macroeconomic fundamentals, there is no evidence for such a correlation for FX reserves, the current account position, the interest rate variables, and countries' economic and financial risk. Hence, while this caveat may apply to e.g. the sovereign rating of countries, it does not apply to most of the other macro fundamentals identified in the previous sub-section as the relevant determinants of the transmission of the crisis across borders and sectors.

Tables 8 – 9

A second issue is the potential endogeneity of the macroeconomic fundamentals to the crisis. In other words, the benchmark results could simply reflect that fact that the crisis has generated both the sharp drops in equity markets and in some countries also a sharp worsening in macroeconomic fundamentals, hence generating a spurious correlation between these two. Although it seems unlikely that macroeconomic fundamentals could change so drastically and especially so unevenly across countries, it is worth exploring this possibility in more detail. Table 9 provides a formal test for this issue by including into the estimation not only the "lagged" values of macroeconomic fundamentals – i.e. as measured during the period Q1 2005 to Q2 2007 – but also the change in each fundamental during the crisis (Q2 2007 to latest available data point).

The estimates in the table indicate quite clearly that such potential endogeneity does not invalidate the findings of the benchmark model. For the macroeconomic fundamentals, it is almost always the level variable before the crisis that is statistically significant, while for the time-varying US beta it is both the lagged level variable and, to a lesser extent, the change in the US beta during the crisis.

Table 10

As a third robustness check, we test the sensitivity of the results to changes in the sample. The findings overall proves highly robust to such changes, e.g. by excluding particular countries or sectors. Table 10 provides the benchmark estimates when excluding all financial sector portfolios from the sample, and shows that our previous results remain unaltered.

[6] There are several papers in the literature on the role of macroeconomic fundamentals in explaining the time-varying integration of equity markets, suggesting that such fundamentals may indeed play some limited role; see e.g. Baele and Inghelbrecht (2006).

4. The role of financial policies in transmitting the crisis

The findings so far emphasise that the current financial crisis has been fundamentally different from past periods and from past boom-bust cycles, in particular in that equity portfolios have become sensitive to country risk rather than risks at the micro or firm level. What is the explanation for this finding? One striking feature of the current financial crisis has been the massive policy response by policymakers to the crisis. This regards monetary and fiscal policies, but in particular also the substantial financial policy interventions in the form of capital injections in both financial and non-financial (e.g. automakers) firms, as well as broad set of new or extended deposit guarantees and debt guarantees in a number of countries.

One hypothesis is that these financial policy responses have altered the transmission channels of the crisis so that investors' assessment of a portfolio's risk is no longer purely based on the portfolio's specific characteristics, but also guided by the question as to whether the firms in this portfolio receive government insurance and support. To get at this hypothesis, we investigate the effect of three different types of financial policies – capital injections, deposit guarantees and debt guarantees – on the transmission process during the crisis. A key feature that we exploit for this analysis is that not all countries have seen such financial policies, and moreover there are differences in the precise measures that were implemented.[7] For that purpose, we extend equation (4) to include the presence or absence of such financial policy measures P_i

$$R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \mu_3 P_i + \varepsilon_i \quad (5)$$

Allowing for interactions between country risk X_i and financial policies P_i yields

$$R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \mu_3 P_i + \eta (X_i P_i) + \varepsilon_i \quad (6)$$

where $P_i = 1$ if a particular financial policy has been introduced in country i during the crisis, and $P_i = 0$ otherwise.[8] As before, the vector of controls, Z_i, includes the factor loadings (US beta) for the integration of each country-sector portfolio with the US market as estimated from equation (1), averaged over the crisis period, as well as the other two Fama-French factors, i.e. firm size and book-to-market value.

There are two specific hypotheses we are interested in. The first is whether or not such policies have helped insulate countries and have made the equity market impact on domestic firms less severe, implying $\mu_3 > 0$ in (5). However, financial policies are of course not implemented at random, and it is possible that such policies are endogenous and have been introduced as a response in particular in countries that have been affected the strongest. This, by contrast, would mean that $\mu_3 < 0$.

The second hypothesis concerns the question whether the introduction of financial policies has changed the sensitivity of portfolio returns to macro risk. If such financial policies imply

[7] The information stems from a variety of data sources, including the BIS, Bloomberg and our own checks of these information from national sources. It should be noted that it is not only advanced economies which implemented such policies, but a number of emerging markets did so as well, while some advanced economies implemented no or only a few of such policy measures.

[8] The magnitude and coverage of such financial policies of course differ significantly across countries. To the extent possible, we have derived measures about the size of capital injections relative to domestic GDP. However, the empirical findings are qualitatively unchanged whether we use simple dummy variables or such ratios in the estimation.

that the pricing of risk is simply shifted from firm-level risk to country risk (risk transfer), we would expect to find that $\eta > 0$ in (6). However, if such policies mean an overall reduction in risk for portfolios (risk reduction), so that country risk becomes less relevant for the pricing of an equity portfolio, the expected sign of the coefficient is $\eta < 0$.

Table 11

Table 11 provides strong evidence that the introduction of financial policies during the financial crisis is associated with a smaller decline in equity returns. Financial policies thus appear to have played an insulating role for portfolios' equity valuation. For all types of macro risks (focusing on those that were identified to be relevant in Table 4) we find that $\mu_3 > 0$, with the point estimates being mostly statistically significant. Moreover, the point estimates for the various proxies of country risk X_i are similar to those of Table 4 without the addition of the vector of financial policies P_i.

Also the magnitude of the effect of financial policies is substantial: countries that introduced or significantly extended their deposit guarantees experienced, on average, equity market declines that were around 10 percentage points lower during the crisis than those countries without. However, what seems to have insulated overall equity market portfolios during the crisis appear to be deposit guarantees and debt guarantees, rather than capital injections. This finding seems sensible as capital injections are usually targeted towards a few, mostly financial institutions. By contrast, deposit guarantees and debt guarantees tend to be much broader, affecting more firms and households, and thus possibly explaining their stronger overall effect on equity markets.

Turning to the second hypothesis, the evidence of Table 11 indicates that the introduction of financial policies has reduced the sensitivity of firms to country risk, i.e. $\eta < 0$ in most of the cases. This suggests that the effect of financial policies has primarily come through an overall reduction in risk, rather than a transfer of risk from the firm level to the country level as outlined above.

Finally, it is important to emphasize a number of potential caveats to this analysis and findings. Importantly, we cannot account for the endogenous character of financial policies. Such policies tend to be implemented as a response to specific difficulties, and hence may be found in countries that have been affected more strongly by the crisis. If this was indeed the case, the interpretation of our findings that financial policies have helped shield firms from the crisis would be strengthened because the empirical estimates indicate that equity markets in countries where financial policies were in place declined less. By contrast, another possibility is that financial policies could be afforded and be credibly implemented only by countries that have had relatively strong fundamentals. If this was the case, our results should not be interpreted in a causal way as the financial policy variables are correlated with macro risk and fundamentals. However, there is no significant correlation between financial policies and macroeconomic fundamentals in our data, at least for those proxies analyzed here.

Other caveats relate to the quality and precision of the data on financial policies. One issue is that we use announced financial policy measures, with some of them not yet or only partially implemented. This is a clear shortcoming, though one may argue that what matters most for the effectiveness of financial policy measures and their announcement is the extent to which they are perceived as credible by market participants, and to what extent it is believed that governments are able and willing to provide future support to the economy and financial sector. Such credibility and expectations are obviously very hard to measure; yet we would argue that market expectations about the commitment and ability of governments to support the domestic economy should be positively related to announced financial policy measures.

Overall, the findings of this section suggest that financial policies – in particular deposit guarantees and debt guarantees – may have played a significant role in the global transmission process by helping reduce the impact of the financial crisis on domestic equity markets. More specifically, the way these policies seem to have functioned is by having insulated domestic firms from country risk. We have stressed a number of caveats and limitations to the analysis, yet these findings provide a plausible explanation for the increased role of country risk for some countries during the current financial crisis.

5. The transmission of shocks

The findings so far have underlined and confirmed that integration with US markets and country-specific macroeconomic risk have been the two key channels through which the current financial crisis has been transmitted to global equity markets. An important caveat and open question is whether the heterogeneity in country-sector portfolio developments during the financial crisis is due to differences in the way these portfolios have responded to common shocks, or whether they are related more to simultaneous, idiosyncratic shocks that are specific to countries or individual sectors.

A more direct way to test this hypothesis is therefore to identify common shocks during and before the crisis, and to analyze their transmission channels. The added advantage of this approach is that it allows focusing on a narrow time window and more cleanly trace the effect of a particular shock through global equity markets. This is the intention of the present section.

5.1 The effect of US shocks on global equity markets

As discussed in section 2, we include two types of common shocks S_t. The first is a set of six key events during the financial crisis, which are ones that are both important for equity markets and at the same time have a US-specific origin. The second set consists of 10 US macroeconomic news, each of which usually occurs once per month. While the crisis events are obviously available only during the crisis, the advantage of the latter US macro news is that they are available both before and during the crisis, thus allowing us to gauge whether and how the transmission of common shocks may have changed during the crisis.

The conditional analysis of the transmission of common shocks thus moves away from the pure cross-sectional perspective of section 3. The frequency of this conditional analysis here is daily, as the common shocks are observable at a daily frequency. To test whether such common US shocks are transmitted to global equity markets, we estimate the following empirical model for each of the 455 country-sector portfolios in our sample on each day *t* (the estimation only including announcement days):

$$R_{i,t} = \alpha + \beta_1 S_t^{crisis} + \beta_2 S_t^{news} + \mu_1 X_{i,t} + \mu_2 Z_{i,t} + \varepsilon_{i,t} \qquad (7)$$

where S_t^{crisis} and S_t^{news} are the respective vectors of crisis events and US macro news, $X_{i,t}$ include the fundamentals previously identified as important to explain the heterogeneity of country-sector returns during the crisis (i.e. FX reserves, sovereign rating and the current account balance), while $Z_{i,t}$ includes as before the US beta and the other two Fama-French controls. The calculation of standard errors takes into account clustering across residuals by country-sector portfolio.

Table 12

Table 12 provides the empirical estimates for equation (7), distinguishing the effect of the common shocks both before and during the crisis. To provide a benchmark for comparison, we also include the results of a related estimation for the US sector portfolios. Two key results stand out. First, not only do non-US equity portfolios react significantly (and with the expected sign) to US-specific shocks, but the transmission of such shocks has become substantially larger during the financial crisis.[9] In fact, the sensitivity of non-US country-sector portfolios to US shocks, on average, has increased three- to fourfold as compared to before the crisis. This increase is thus truly remarkable and indicative that the global transmission of shocks has intensified during the crisis.

A second key finding is that the sensitivity of equity returns has increased not only for non-US portfolios but about equally for US portfolios.[10] Taken together, this finding underlines the greater transmission of common shocks to global equity markets, yet it is consistent with the finding of stable factor exposures (betas) to US equity markets during the crisis, as outlined in section 2, as both non-US and US markets have become simultaneously more sensitive to the common shocks.

5.2 Determinants of the shock transmission

What explains this much stronger transmission of common US shocks during the crisis as compared to before? And specifically, can the transmission to different equity portfolios be explained by differences in integration with US markets or rather by differences in underlying country risk? To get at this question of the transmission channels, we estimate a difference-in-difference model of the following form:

$$\begin{aligned} R_{i,t} = {} & \alpha + \beta_1 S_t + \beta_2 D_t + \beta_3 X_{i,t} \\ & + \gamma_1 (S_t * D_t) + \gamma_2 (S_t * X_{i,t}) + \gamma_3 (D_t * X_{i,t}) \\ & + \delta_1 (S_t * D_t * X_{i,t}) + \omega Z_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{8}$$

where $D_t = 1$ during the crisis, and $D_t = 0$ otherwise. The vector of Fama-French (1992) controls $Z_{i,t}$ is in equation (8) only included without interactions, though we tested for the same difference-in-difference specification for $Z_{i,t}$ as well. The OLS estimator of (8), as before, takes into account clustering across residuals by country-sector portfolio.

Our empirical hypotheses are as follows. A first question is whether more integrated country-sector portfolios (or those in countries with high country risk) have become more affected by US shocks during the crisis than those with a lower degree of integration (or lower country risk). If this hypothesis is true, we would expect that H_0: $\delta_1 > 0$ for all of the shocks (except unemployment shocks, for which H_0: $\delta_1 < 0$).

[9] It may be tempting to suspect that the higher sensitivity of global equity markets to US shocks during the crisis may simply reflect the fact that equity markets have been falling so strongly and exhibited substantially more day-to-day volatility during the crisis. However, note that the US macro news do take both positive and negative values, also during the crisis, as they are measured as the unexpected component of the announcement. In other words, even if e.g. employment has been declining, the surprise component for this variable at times has been positive as market participants expected even stronger declines.

[10] The precision for the US estimates is lower than that for non-US portfolios as the former includes only 10 sector portfolios, and thus are based on far fewer observations.

An alternative hypothesis is that the transmission of US shocks has indeed intensified during the crisis but that it has been indiscriminate and affected all equity markets and portfolios in the same manner. For the empirical model, this would imply that H_0: $\gamma_1 > 0$ and $\delta_1 = 0$.

Yet a third plausible hypothesis could be that US shocks always affect portfolios with a high degree of integration or poor fundamentals relatively more, and that the crisis did not change anything about this transmission mechanism. A confirmation of this hypothesis would imply that H_0: $\gamma_2 > 0$ and $\delta_1 = 0$.

Table 13

Table 13 shows the empirical point estimates for the various parameters of equation (8), with $X_{i,t}$ in this case as the integration of each of the 455 portfolios with US markets. Two key findings stand out from the table. First, portfolios with a high degree of integration with US markets have become substantially more strongly affected during the crisis than those with a low degree of integration. In most cases $\delta_1 > 0$ and δ_1 is large in magnitude. By contrast, there is little evidence that the transmission of common US shocks has intensified during the crisis in an indiscriminate manner, i.e. $\gamma_1 > 0$ at usual significance levels holds only for 3 of the 10 US macro shocks.

Second, during the pre-crisis period, country-sector portfolios with a high degree of integration tended to be more sensitive to US-specific shocks ($\gamma_2 > 0$) yet the sensitivity in this pre-crisis period is much smaller than during the crisis (i.e. $\gamma_2 < \delta_1$).

Tables 14 – 15

Tables 14 – 15 repeat the same analysis but using two of the country risk proxies, or country-specific fundamentals instead. Table 14 uses the ratio of FX reserves to GDP; while Table 15 takes the current account to GDP ratio. In none of the cases do we find evidence that the transmission of common shocks during crisis has affected disproportionally more those countries with weaker fundamentals (i.e. lower reserves or a worse current account position) as in no case it holds that $\delta_1 > 0$. By contrast, in most cases we find that $\gamma_1 > 0$, which suggests that the transmission of common shocks has indeed intensified during the crisis but that this unrelated to the strength of fundamentals or portfolio-specific characteristics.[11]

In summary, conditioning on common US shocks, our results further confirm that the current financial crisis did not spread indiscriminately across countries and sectors, but that is has affected highly US-sensitive equity sector portfolios more strongly. By contrast, the transmission of those common US shocks to global equity markets seems to be unrelated to country risk and macroeconomic fundamentals of countries. This suggests that the larger decline in equity markets in countries with weak policies and fundamentals, as found in the analysis of section 3, is likely explained by idiosyncratic country shocks, such as the countries' policy responses to the crisis.

6. Conclusions

The current financial crisis is truly remarkable in its severity and global reach. The objective of the paper has been to understand the global transmission channels of the crisis, focusing on

[11] For brevity reasons we show in tables 13 and 14 only the findings for two of the macroeconomic fundamentals. However, the findings are basically identical for the other proxies for country risk, as well as the firm- or portfolio-specific variables proxying financial constraints or exposure at the portfolio level.

equity markets. We stress that the paper can say nothing about why the crisis occurred and why it was so severe overall. Its aim has been to understand the transmission mechanisms to global equity markets and the cross-sectional heterogeneity, i.e. how and why equity markets globally have been affected so differently.

The paper finds that the degree of integration of equity portfolios with the US market has been a key factor in the transmission process: valuations of those equities highly integrated with the US market before the crisis increased relatively more prior to the crisis, but also corrected significantly more during the crisis. Hence, the global transmission is to some extent not unexpected as it partly reflects the normal degree of market integration with the United States. In fact, the time-varying integration with US markets – estimated from a standard CAPM specification – indicates that the average beta has remained rather stable, while the dispersion of betas across portfolios declined sharply during the crisis.

The findings of the paper suggest that country risk is a second key factor explaining the global transmission of the crisis. Differences in FX reserves, sovereign ratings and current account positions (as well as more general, composite indices of country risk) are highly significant, with portfolio returns in countries with weak country fundamentals declining by about one third more than those in countries with low country risk.

The results suggest that financial integration with US markets and country risk played central roles in making the crisis global, and thereby give support to the hypotheses of retrenchment and repatriation of capital to US markets as well as to that of global de-leveraging and risk exposure reduction as key factors explaining why the crisis has spread globally. They therefore also give empirical support – and quantify – earlier claims made by policy-makers that a massive undervaluation of risk was one of the root causes of the current crisis and that a significant reappraisal of risk was a major trigger in its eruption.[12] By contrast, the absence of evidence we find in the data for the role of sector-level financial constraints suggest that the third potential channel of transmission, risks at the micro or firm level, in particular the financial constraints and exposure of firms, and related to a possible global liquidity squeeze, has been less relevant.

Moreover, the transmission mechanism in the current crisis appears to have been fundamentally different from past periods and crises. In particular, while the TMT boom-bust cycle of the late 1990s and early 2000s was very similar in its adjustment pattern, a fundamental difference is that country risk did not play a central role as a global transmission channel, unlike in the current crisis. Finally, conditioning on common US shocks, our results further confirm that the current financial crisis did not spread indiscriminately across countries and sectors, but that is has affected highly US-sensitive equity sector portfolios more strongly.

What has made the current financial crisis so special and different? One potential explanation for our finding that macro risk at the country level has become key for the global transmission process is the substantial policy response to the crisis. Financial policies (in particular credit and deposit guarantees and capital injections), if credible and timely, imply in essence both a reduction in risk for individual firms as well as a transfer of risk on a massive scale from individual firms (not just in the financial sector) to governments. This may in part account for the fact that investors have discriminated more across countries (and governments) rather than across firms during the crisis. In fact, we find that financial policies – in particular deposit guarantees and debt guarantees – have helped shield and insulate firms to some extent from the impact of the crisis and from country risk, with equity returns declining by about 10

[12] See, e.g. Trichet (2008): "The root cause of the crisis was the overall and massive undervaluation of risk across markets, financial institutions and countries".

percentage points less for portfolios in countries where financial policies were introduced or significantly extended during the crisis.

The findings have a number of implications for economic policy. One of the largely unanimous lessons from the crisis has been the recognition for the need of better microprudential supervision and regulation. Yet, the fact that macroeconomic risk at the country level played such a central role in the global transmission of the current financial crisis – including to countries with few microprudential difficulties and in which firms had little financial leverage – underlines the importance and need for a better understanding of macroprudential risks and a closer surveillance of such risks both at a country level and at a global level.

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Figure 1: Evolution of global equity returns

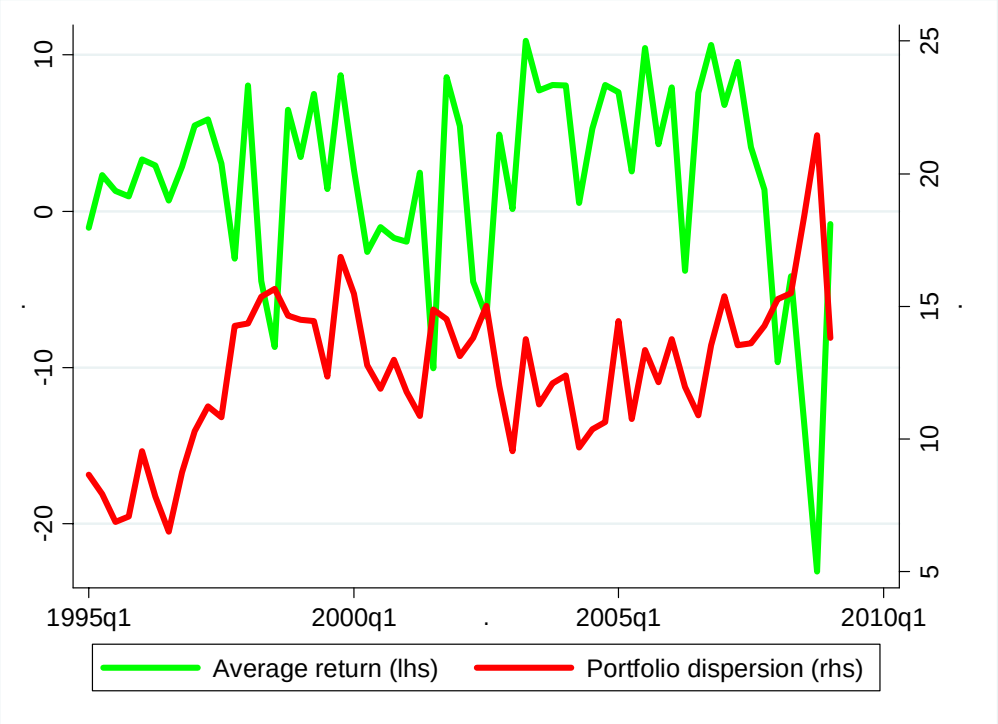
A. World returns and US returns

B. Regional returns

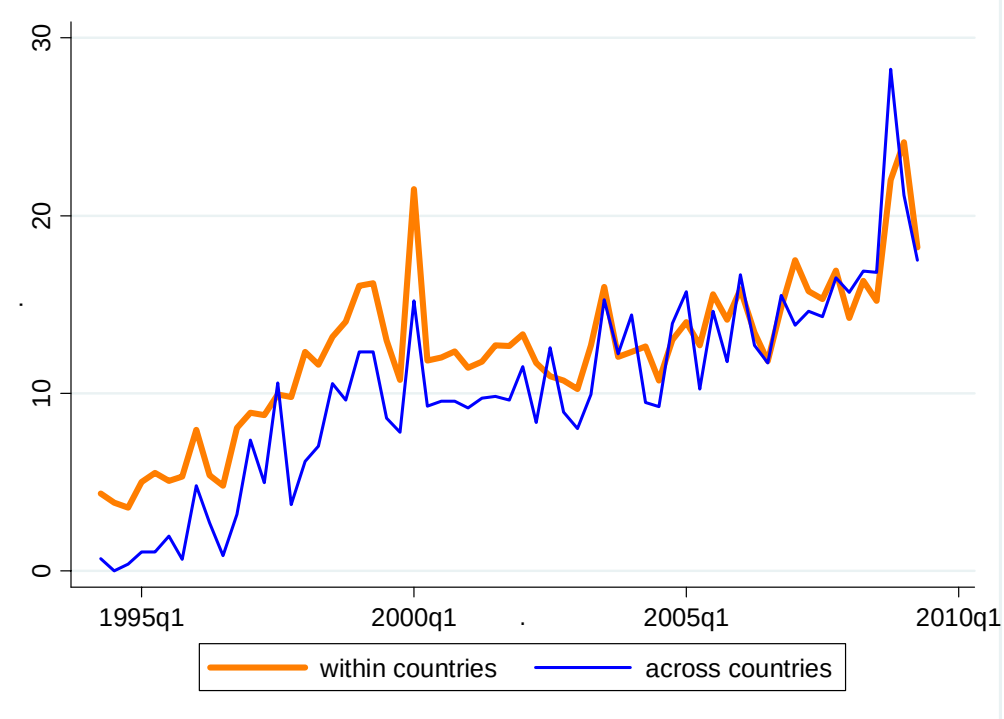
Notes: The figures show equity indices' differences in valuation (in %) relative to the beginning of the financial crisis on 7 August 2007, based on MSCI indices.

Figure 2: Portfolio equity returns and their dispersion

A. Average portfolio returns and overall dispersion



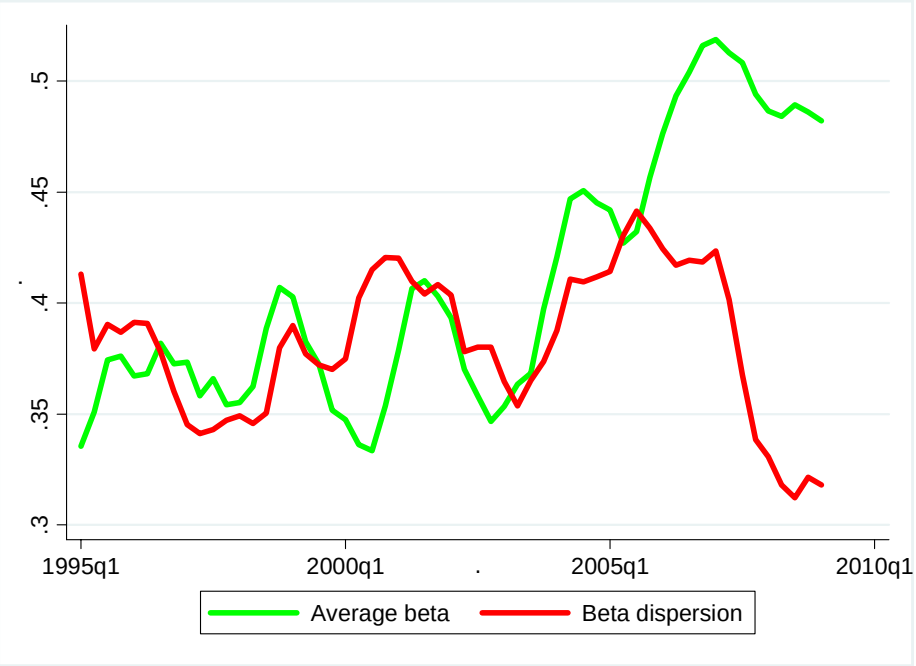
B. Dispersion within countries versus across countries



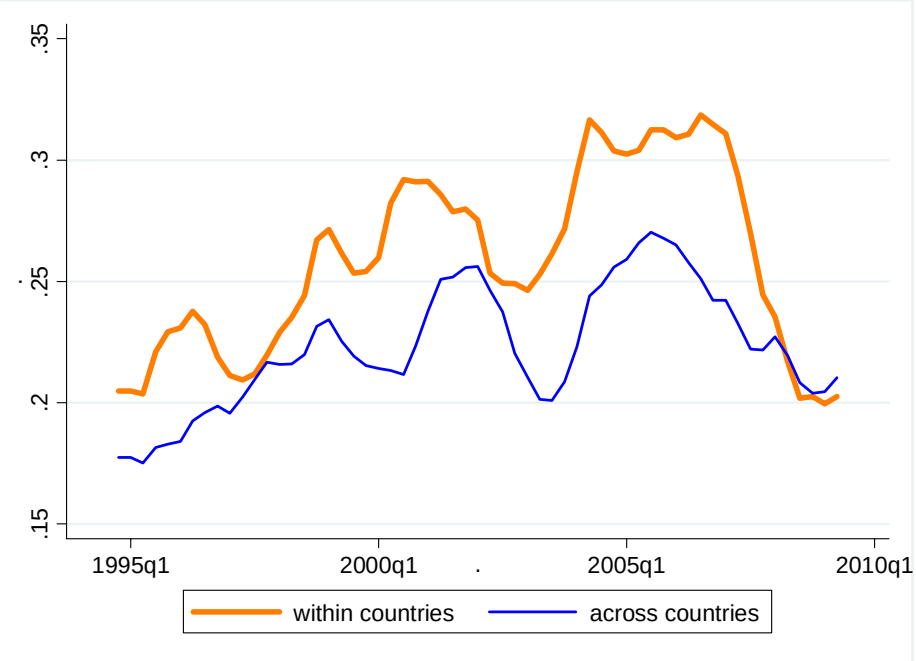
Notes: Panel A shows the average (unweighted), quarterly returns across the 455 portfolios in the sample together with their standard deviation within each quarter. Panel B shows the standard deviation of quarterly returns within countries versus across countries for these portfolios.

Figure 3: Evolution of time-varying US betas and their dispersion

A. Average betas and beta dispersion



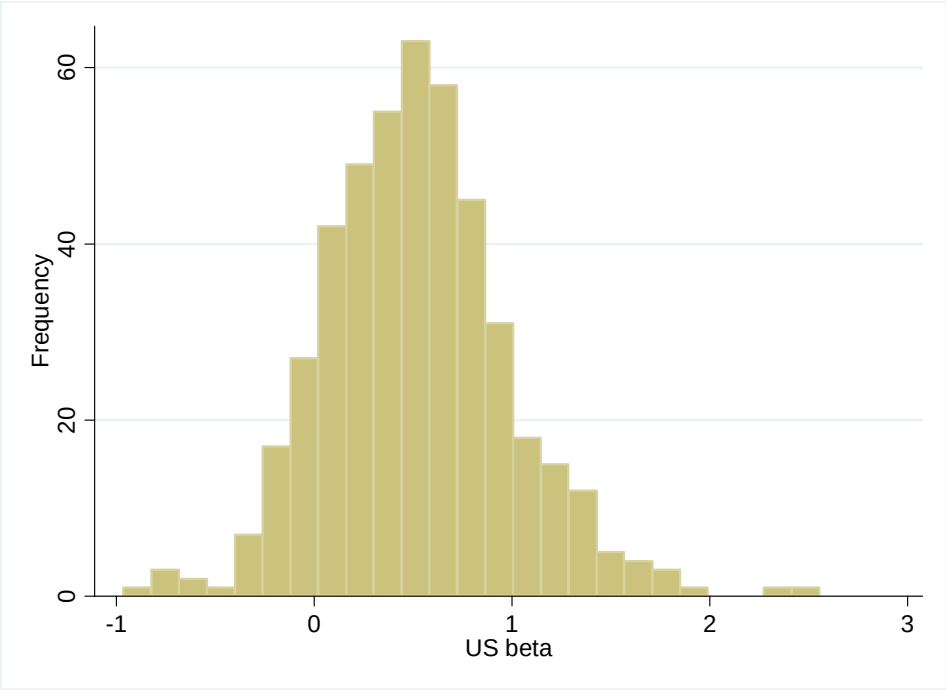
B. Dispersion within countries versus across countries



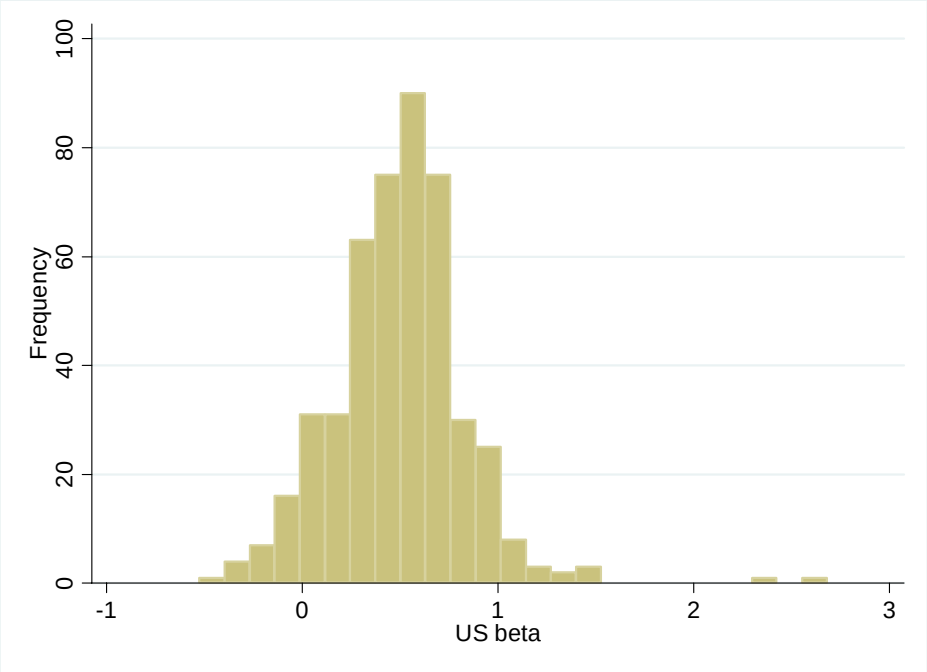
Notes: Panel A shows the average (unweighted), quarterly US betas across the 455 portfolios in the sample together with their standard deviation within each quarter. Panel B shows the standard deviations of these betas within countries versus across countries. The estimation of the betas uses weekly returns over semi-annual time windows, based on equation (1), i.e. $R_{i,t} = E_{t-1}(R_{i,t}) + \beta_{i,t}^{US} R_t^{US} + \beta_{i,t}^{RG} R_t^{RG} + e_{i,t}$ in which US market returns R_t^{US} and regional market returns R_t^{RG} are the only relevant factors for the excess return of country-sector portfolio *i* at time *t*, $R_{i,t}$.

Figure 4: Distribution of time-varying US betas before and during crisis

A. US betas *before* the crisis (Q2 2007)



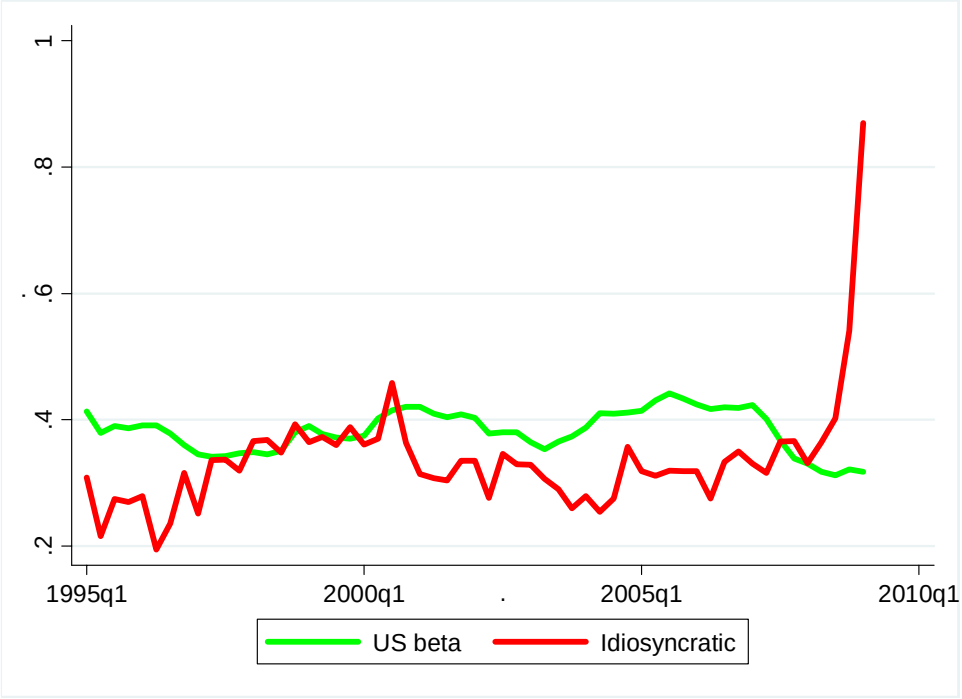
B. US betas *during* the crisis (Q4 2008)



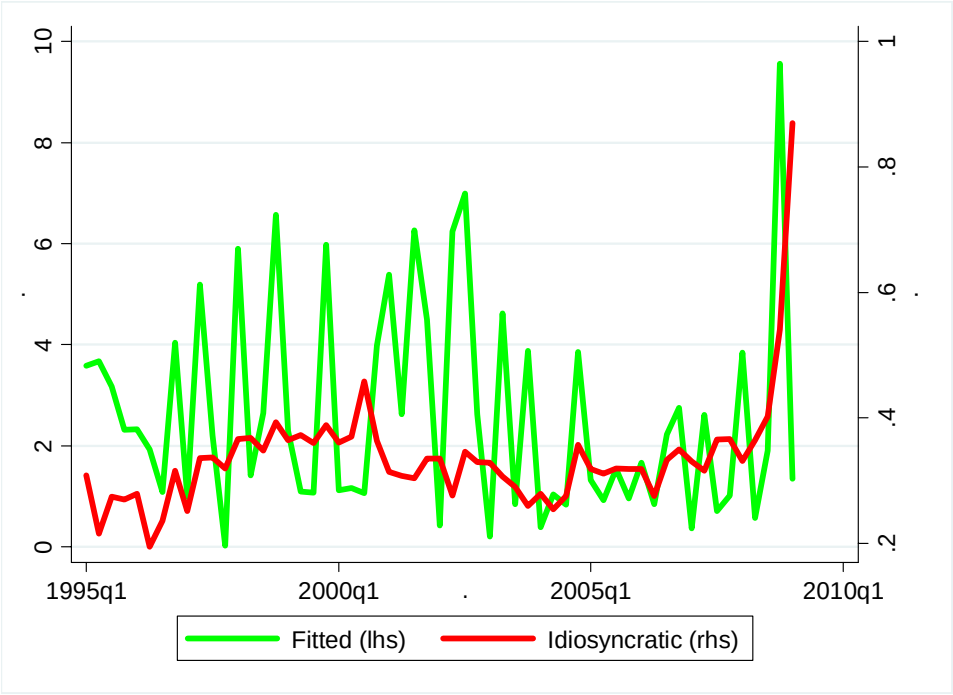
Notes: Panel A shows the histogram for the US betas across the 455 portfolios in the sample before the crisis (Q2 2007), while Panel B shows the distribution during the height of the crisis (Q4 2008). The estimation of the betas uses weekly returns over semi-annual time windows, based on equation (1), i.e. $R_{i,t} = E_{t-1}(R_{i,t}) + \beta_{i,t}^{US} R_t^{US} + \beta_{i,t}^{RG} R_t^{RG} + e_{i,t}$ in which US market returns R_t^{US} and regional market returns R_t^{RG} are the only relevant factors for the excess return of country-sector portfolio *i* at time *t*, $R_{i,t}$.

Figure 5: Decomposition of cross-section dispersion in returns – US betas versus idiosyncratic portfolio return components

A. Dispersion in betas versus idiosyncratic component

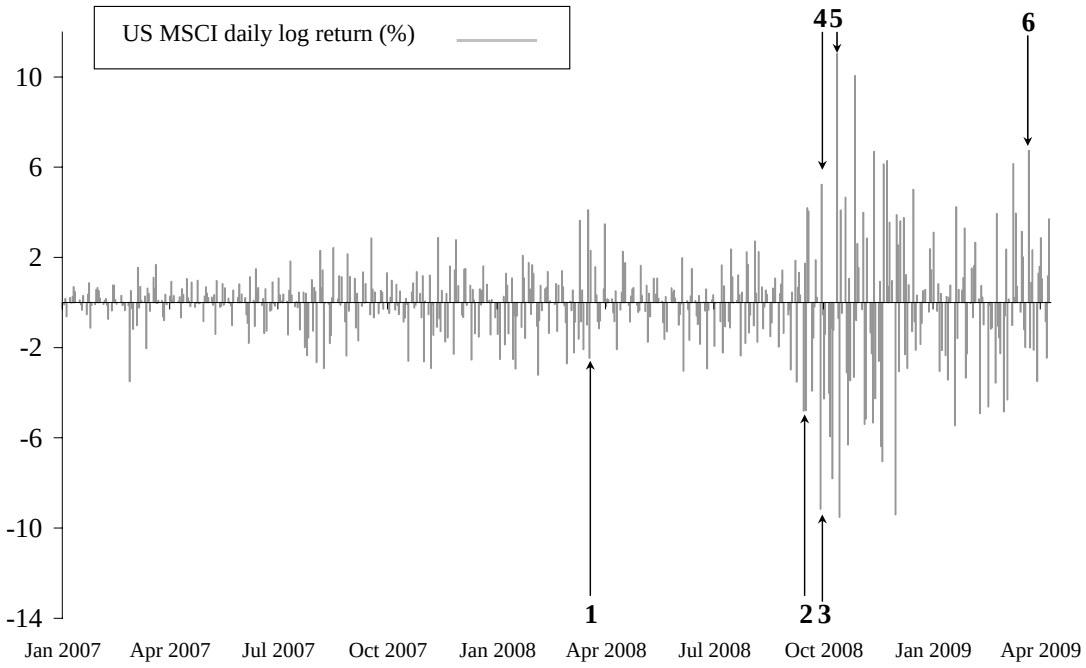


B. Dispersion in fitted portfolio returns versus idiosyncratic component



Notes: Panel A shows the dispersion (standard deviation) each quarter in the US betas and the idiosyncratic return components $e_{i,t}$ of equation (1) across the 455 portfolios , using weekly returns over semi-annual time windows, while Panel B shows the dispersions in the returns explained by the time-varying integration with US markets $(\hat{\beta}_{i,t}^{US} R_t^{US})$ against the idiosyncratic return components $e_{i,t}$ of equation (1).

Figure 6: Six key crisis-related shocks

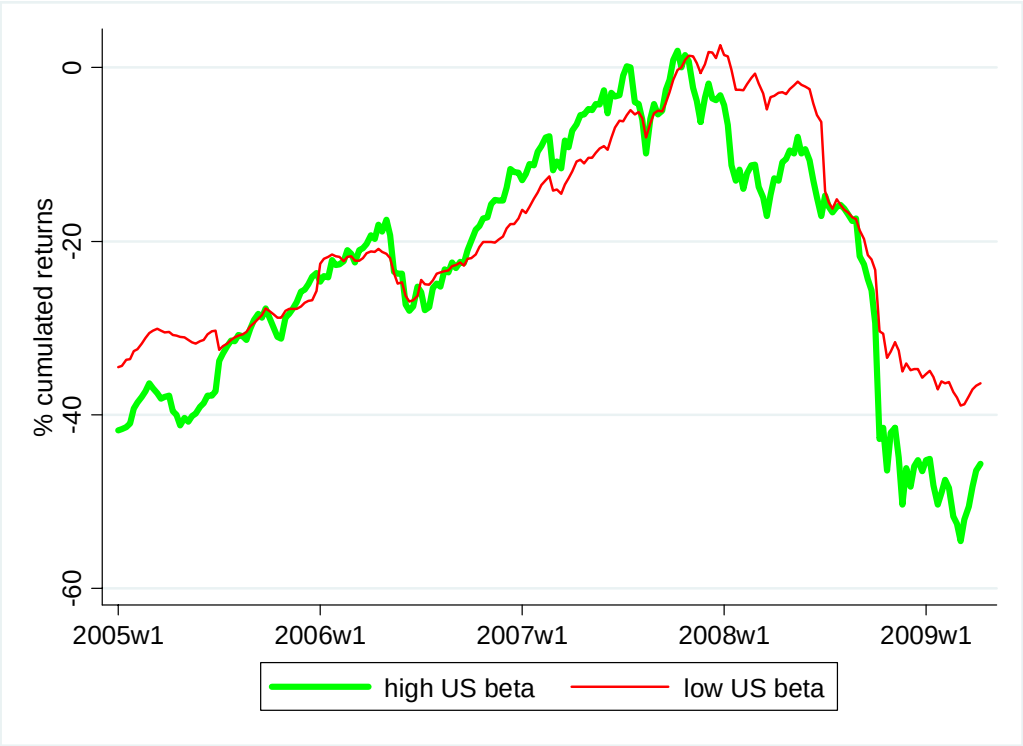


Notes: The figure shows daily log returns of the US MSCI stock index, and highlights the 6 key crisis shocks that we employ in our regression analysis, i.e.

1. 16 March 2008: Bear Stearns collapse and sale to JPMorgan
2. 15 September 2008: Lehman Brothers declares bankruptcy
3. 29 September 2008: U.S. House Rejects $700 Billion Financial-Rescue Plan
4. 30 September 2008: FDIC Seeks Authority to Raise Deposit Insurance Limit
5. 13 October 2008: US Treasury announces investment in 9 major US banks
6. 23 March 2009: U.S. Treasury Announces $1 Trillion Plan to Buy Distressed Debt

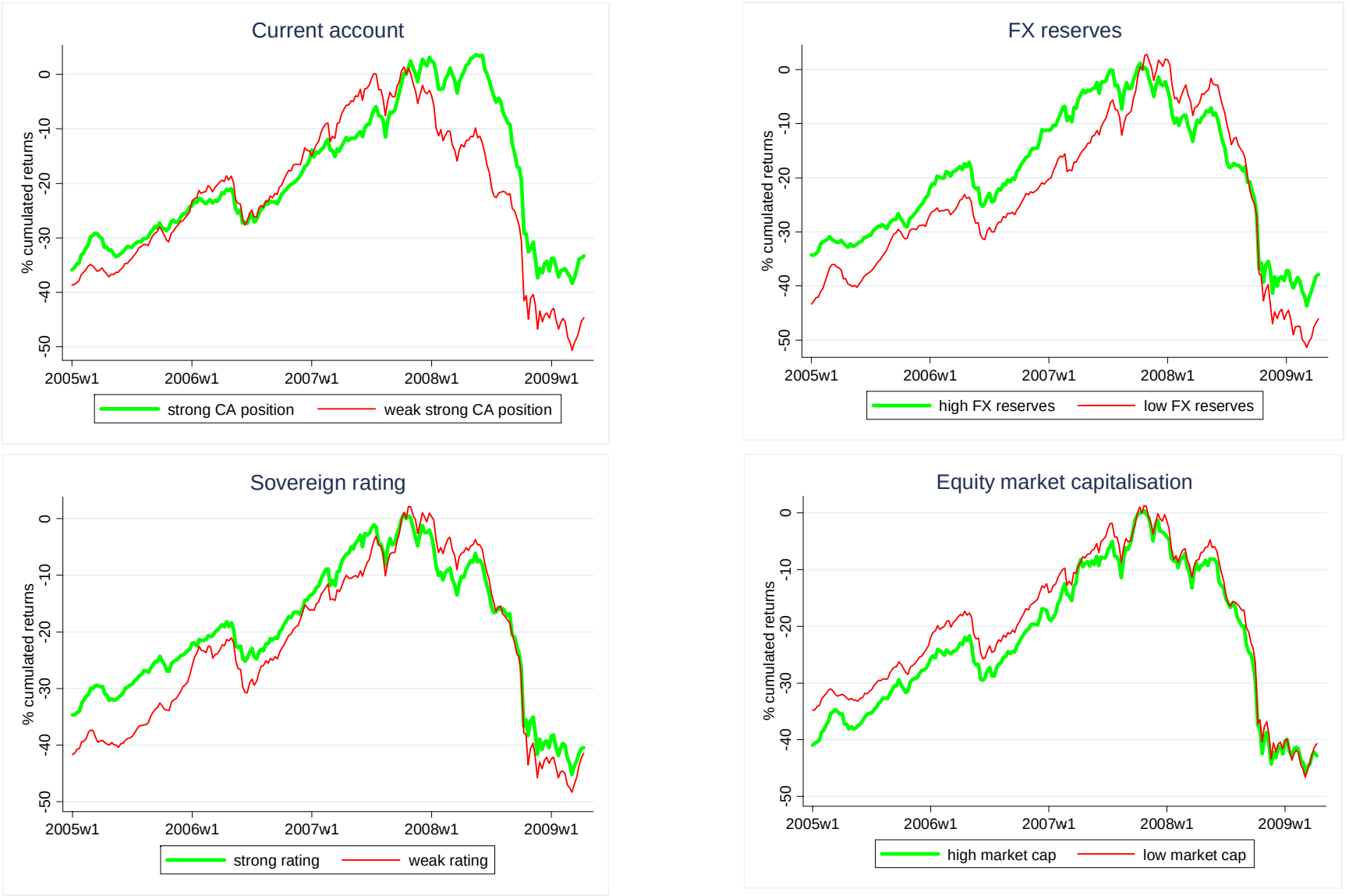
These were selected among the 400 events reported in the Bloomberg crisis timeline on the basis of two criteria: (a) they can be identified cleanly as US specific in nature and (b) they are important in terms of their market impact (defined as that being larger than the 95^{th} percentile of the distribution of daily absolute US MSCI return between 1 January 2007 and the day of the event.

Figure 7: Role of integration with US market (US beta) for crisis severity



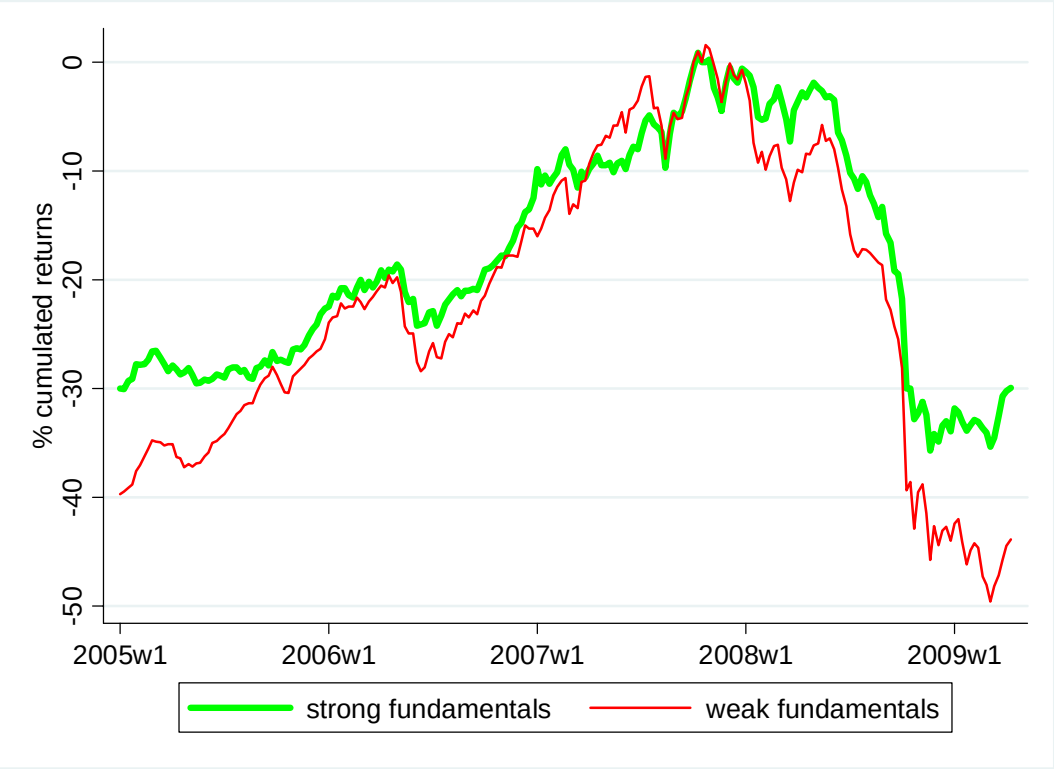
Notes: The figure shows the cumulated average (unweighted) equity returns (relative to 7 August 2007) across 455 country-sector portfolios, with each portfolio's US beta grouped relative to the average for all 455 country-sector portfolios. All betas are measured as the average over January 2005 to July 2007, i.e. *before* the crisis.

Figure 8: Role of country-specific macroeconomic fundamentals for crisis severity



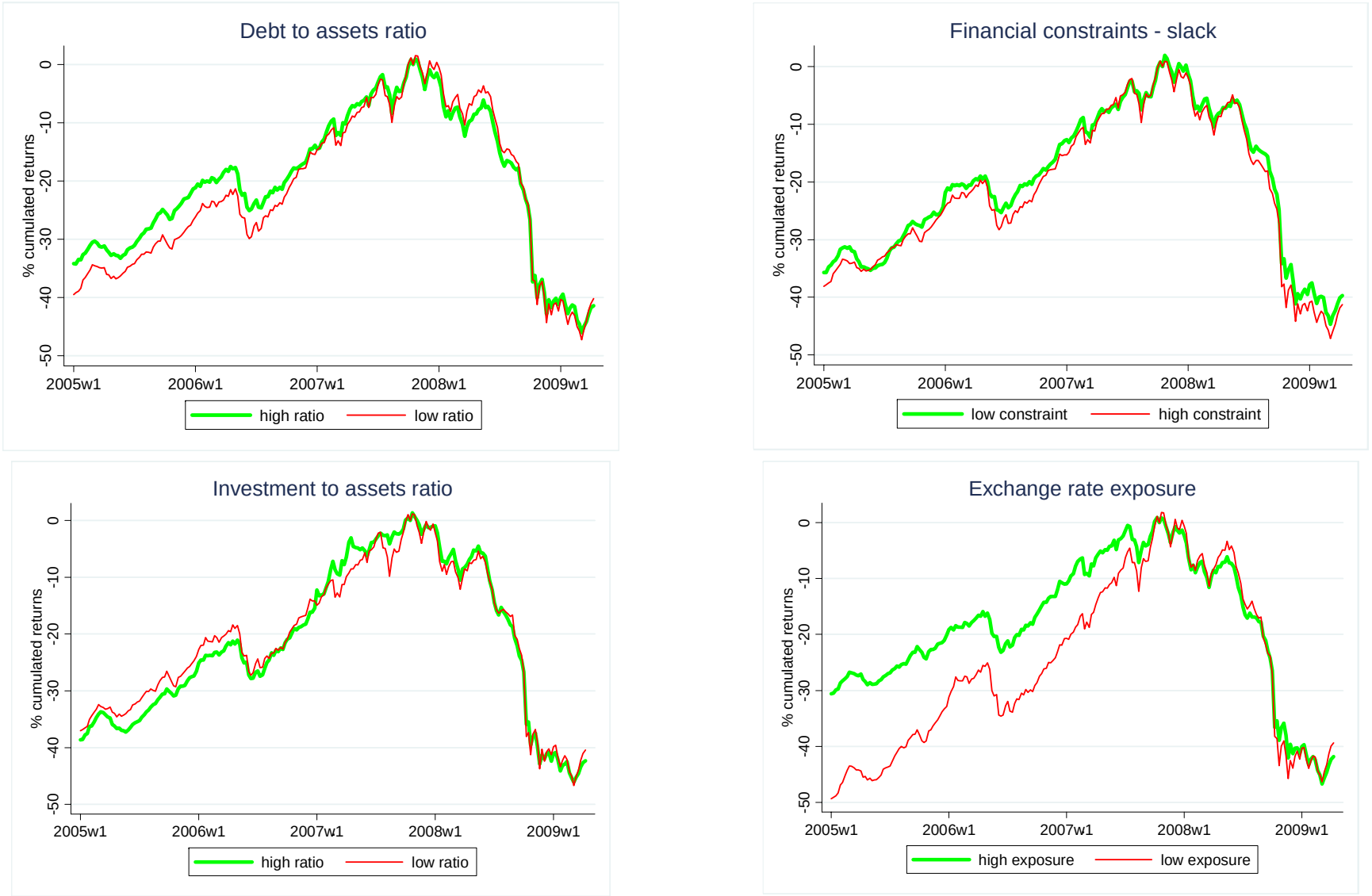
Notes: The figure shows the cumulated average (unweighted) equity returns (relative to 7 August 2007) across 455 country-sector portfolios (for 64 industrialized and emerging markets), with each country's fundamentals grouped relative to the average for all 64 countries before the crisis.

Figure 9: Role of country-specific macroeconomic fundamentals for crisis severity



Notes: The figure shows the cumulated average (unweighted) equity returns (relative to 7 August 2007) across 455 country-sector portfolios (for 64 industrialized and emerging markets), for those stocks in countries with high reserves, a strong current account position, and a high sovereign rating compared to the average for all 64 countries before the crisis.

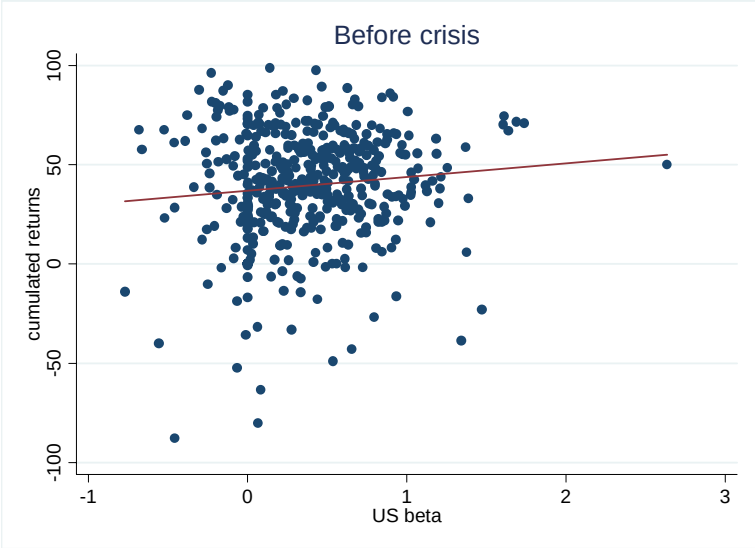
Figure 10: Role of sector-level risk for crisis severity

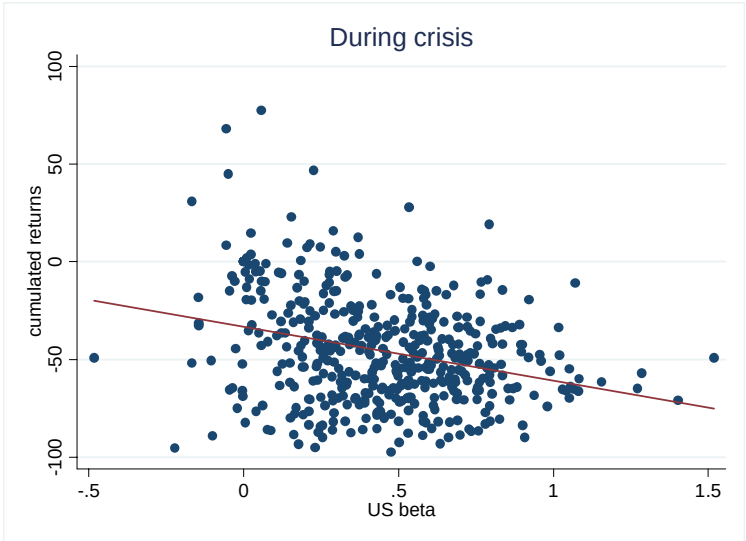


Notes: The figure shows the cumulated average (unweighted) equity returns (relative to 7 August 2007) across 455 country-sector portfolios (for 64 industrialized and emerging markets), with each sector's characteristics grouped relative to the average for all 455 country-sector portfolios before the crisis.

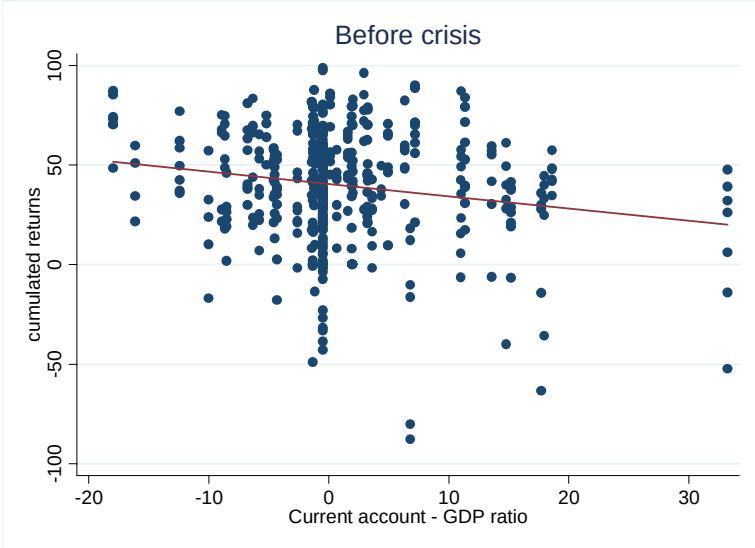
Figure 11: Scatterplots – linking equity returns to US beta and current account positions

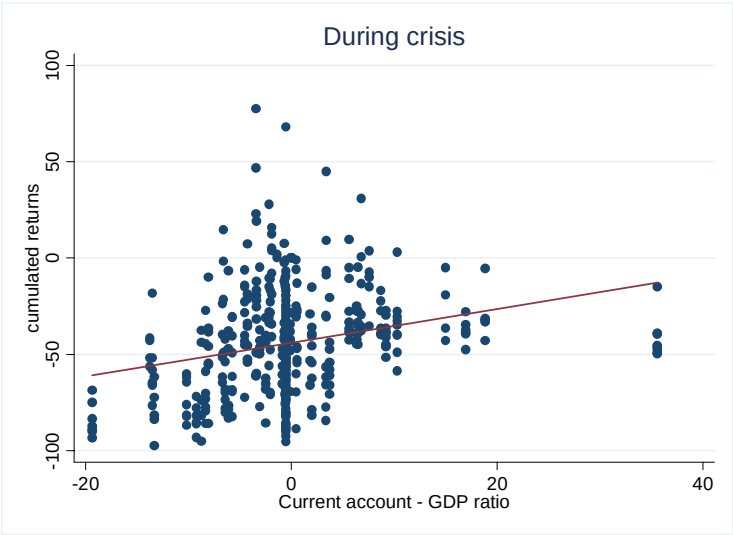
A. Integration with US market - US beta





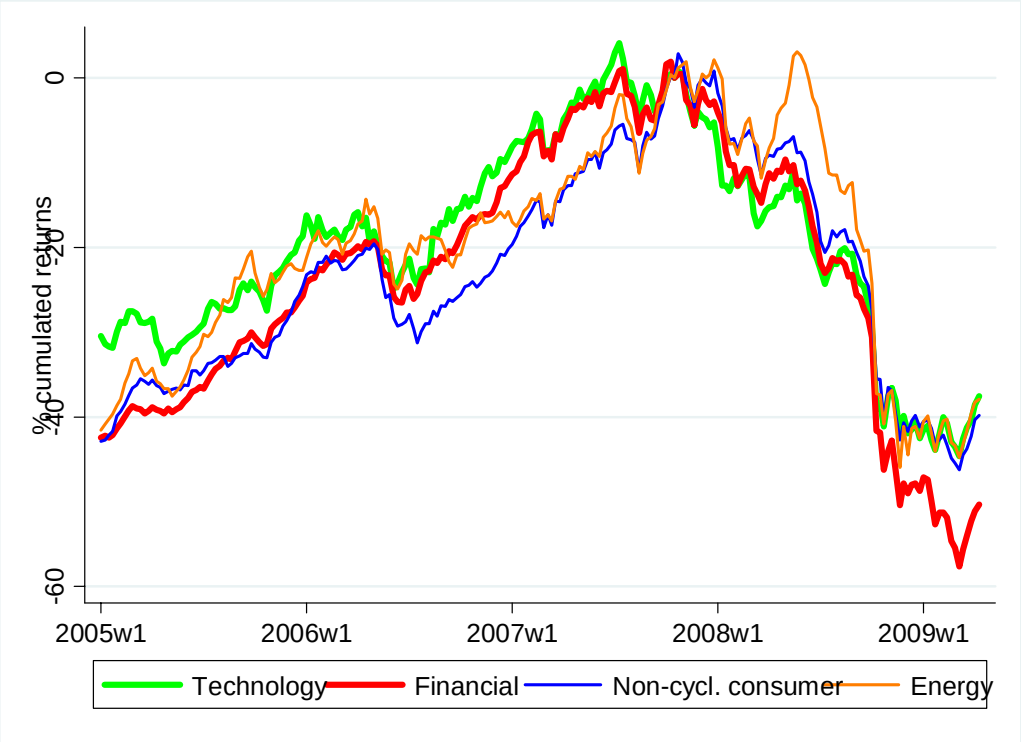
B. Current account position





Notes: The figures show the cumulated equity returns for each of the 455 country-sector portfolios before the crisis (1 Jan 2005 till 6 August 2007) versus during the crisis (7 August 2007 till 31 March 2009) against the US beta (Panel A) and against the current account – GDP ratio (Panel B) for each portfolio.

Figure 12: Differences in sector-specific returns during crisis



Notes: The figure shows the cumulated average (unweighted) equity returns (relative to 7 August 2007) for four of the ten sectors across the 455 country-sector portfolios in the sample.

Table 1: Country equity indices and underlying listed firms used to create the sample of 455 country-sector portfolios

Country	Name of stock index	No. of listed firms	Country	Name of stock index	No. of listed firms
	Industrialised			**Asia-Pacific**	
Australia	S&P ASX	30			
Austria	ATX	20	China	Shanghai SE 50	50
Belgium	BEL20	20	Hong Kong	Hang Seng	42
Canada	S&P TSE 60	60	India	BSE Sensex 30	30
Denmark	OMX20	20	Indonesia	Jakarta LQ-45	45
Finland	OMX25	25	Korea	Kospi 50	50
France	CAC 40	40	New Zealand	NZX 15	15
Germany	DAX	30	Pakistan	Karachi 30 Index	30
Ireland	ISEQ	60	Singapore	Strait Times	30
Italy	MIB 30	30	Taiwan	TSEC Taiwan 50	50
Japan	Topix 70	70	Thailand	SET 50	50
Luxembourg	LuxX	9			
Netherlands	AEX	25		**Middle-East and Africa**	
Portugal	PSI 20	20			
Slovenia	SBI20	15	Bahrain	BHSE	24
Spain	IBEX 35	35	Botswana	Gaborone	16
Sweden	OMX 30	30	Egypt	CASE	30
Switzerland	SMI 30	20	Israel	Tel Aviv-25	25
UK	Footsie 100	100	Lebanon	BLOM	19
			Oman	MSM30	30
	Emerging Europe		Qatar	DSM20	20
			Tunisia	SE BVMT	32
Bosnia	BIRS	13	UAE	DFM	29
Bulgaria	SOFIX	20			
Croatia	CROBEX	28		**Latin America**	
Czech Republic	PSE	14			
Estonia	OMX	18	Argentina	Merval	22
Hungary	BSE	14	Bermuda	BSX	21
Iceland	OMX ICEX	11	Brazil	Bovespa	66
Latvia	OMX	35	Chile	IPSA	40
Lithuania	OMX	32	Colombia	IGBC General	28
Malta	MSE	17	Costa Rica	BCT	6
Norway	OBX	24	Jamaica	JSE	39
Poland	WIG 20	20	Mexico	Bolsa	36
Romania	BET	10	Venezuela	IBC	17
Russia	MICEX	30			
Serbia	Belex 15	15			
Turkey	ISE National 30	30			
Ukraine	PFTS	19			
Total number of countries		**64**			
Total number of listed firms		**1,901**			

Source: Bloomberg.

Notes: the 10 broad industry sectors taken from Bloomberg's classification used to create the market-weighted country-sector equity portfolios are: (i) basic materials, (ii) communications, (iii) consumer cyclical goods, (iv) consumer non-cyclical goods, (v) diversified, (vi) energy, (vii) financials, (viii) industrial, (ix) technology and (x) utilities. For the US, the stock index used is the S&P 500.

Table 2: Summary statistics, macro and exposure determinants

Variables	Definition	mean	std. dev.	min.	max.
Macroeconomic fundamentals:					
FX reserves	Ratio of FX reserves to GDP	18.35	4.69	4.80	100.70
Sovereign rating	Rating of country's sovereign debt	16.29	4.75	6	22
Current account position	Ratio of current account to GDP	0.68	7.59	-17.11	27.98
Government budget	Ratio of fiscal balance to GDP	-0.18	4.24	-7.80	19.61
Interest rate	3-month money market, in %	0.82	3.60	-13.03	13.39
Inflation rate	CPI inflation rate, in %	4.30	3.47	-1.20	17.12
Unemployment rate	in %	7.81	6.18	2.10	38.71
Composite country risk	ICRG composite country index	76.48	7.73	54.30	91.80
Composite economic country risk	ICRG country economic risk index	38.89	4.39	28	49
Composite financial country risk	ICRG country financial risk index	38.92	4.79	28	50
External exposure:					
Trade openness	Ratio of exports plus imports to GDP	108.39	76.43	28.17	455.40
Financial openness	Ratio of portfolio assets & liab. to GDP	-1.19	9.87	4.42	64.41
Equity market capitalisation	Ratio of equity market cap. To GDP	71.86	90.59	4.60	593.90
Exchange rate exposure	exposure coefficient, see section 2	-0.71	7.08	-17.93	27.50
Firm-specific characteristics:					
Exchange rate exposure	exposure coefficient, see section 2	-8.42	93.56	-690.75	808.82
Interest rate exposure	exposure coefficient, see section 2	3.99	126.88	-833.46	577.24
Current ratio	Current ratio to fixed assets	2.90	11.79	0.17	232.70
Cash flows	Ratio of cash flows to fixed assets	36.30	106.06	-97.91	1629.78
Debt-assets ratio	Ratio of total debt to fixed assets	24.26	152.32	0.00	2864.94
Sales growth	in %	12.66	252.94	-29.98	546.87
Investment-fixed assets ratio	Ratio of net capital expend. to fixed assets	10.13	24.11	-237.15	356.01
Financial policy variables:					
Deposit guarantees	BIS, Bloomberg timeline, national sources	0.44	0.50	0	1
Debt guarantees	BIS, Bloomberg timeline, national sources	0.32	0.47	0	1
Capital injections	BIS, Bloomberg timeline, national sources	0.26	0.44	0	1

Sources: IMF (IFS, WEO, DOTS, CPIS), ICRG, Bloomberg. The measures shown in the table are averages for 2005-2007 across the 455 portfolios in the sample; except for the financial policy variables, which are numbers for the crisis period since 7 August 2007.

Table 3: Summary statistics, US macro announcement surprises

			Surprise / shock	
Variable	***Definition / Unit***	***Obs.***	***Mean***	***std. dev.***
1. Crisis shocks				
Crisis shocks	+1, -1 indicator variable	6	0.0	--
2. Real activity				
Industrial production	MoM % change	55	-0.189	1.003
GDP	Quarterly YoY % change	20	-0.151	0.330
NF payroll employment	MoM change (100,000)	60	-0.137	0.605
Unemployment	in %	40	-0.007	0.113
Retail sales	in %	56	-0.033	0.716
Workweek	in hours	33	-0.134	0.361
3. Confidence / forward-looking				
NAPM / ISM	index (around 50)	58	-0.006	0.440
Consumer confidence	index (around 100)	60	0.000	0.190
Housing starts	Monthly, in 1000	60	0.004	0.348
4. Net exports				
Trade balance	in USD billion	59	0.011	0.165

Sources: MMS, S&P and Bloomberg.

Table 4: The role of country risk in the financial crisis

	Macroeconomic fundamentals										External exposure			
Variable:	FX reserves	Sovereign rating	Current account position	Government budget	Interest rate	Inflation rate	Unemploy-ment rate	Composite country risk	Composite economic country risk	Composite financial country risk	Trade openness	Financial openness	Equity market capitalisation	Exchange rate exposure
A. During the crisis: 7 August 2007 – 15 March 2009														
Variable:	0.765*	1.093**	0.593**	0.611	3.408**	-0.749	-1.000**	0.813***	1.242**	1.453***	0.003	-0.395*	0.020	0.048
	0.394	*0.494*	*0.253*	*0.571*	*1.353*	*0.649*	*0.498*	*0.274*	*0.596*	*0.442*	*0.019*	*0.199*	*0.013*	*0.387*
Beta	-0.281***	-0.341***	-0.259***	-0.267***	-0.262***	-0.306***	-0.282***	-0.324***	-0.257***	-0.312***	-0.274***	-0.256**	-0.288***	-0.267***
	0.094	*0.095*	*0.094*	*0.098*	*0.094*	*0.100*	*0.094*	*0.093*	*0.093*	*0.099*	*0.097*	*0.097*	*0.095*	*0.092*
Observations	432	432	439	439	439	439	439	432	432	432	432	439	432	441
R-squared	0.19	0.2	0.2	0.18	0.21	0.18	0.19	0.22	0.21	0.24	0.17	0.18	0.18	0.17
B. Before the crisis: 1 January 2005 -- 6 August 2007														
Variable:	-1.415**	-2.176**	-0.671	-1.036	0.878	1.788	1.776***	-1.299***	-0.241	-1.427*	-0.001	0.244	-0.018	-1.435***
	0.671	*0.992*	*0.469*	*0.779*	*1.140*	*1.653*	*0.555*	*0.468*	*0.951*	*0.805*	*0.040*	*0.273*	*0.032*	*0.523*
Beta	0.304**	0.388***	0.277**	0.267**	0.263**	0.329**	0.298**	0.367***	0.281**	0.330***	0.281**	0.277**	0.291**	0.282***
	0.121	*0.119*	*0.121*	*0.120*	*0.121*	*0.124*	*0.120*	*0.119*	*0.120*	*0.120*	*0.120*	*0.120*	*0.122*	*0.099*
Observations	435	435	442	442	442	442	442	435	435	435	435	442	435	444
R-squared	0.12	0.13	0.11	0.1	0.1	0.11	0.13	0.13	0.11	0.12	0.11	0.1	0.11	0.13

Notes: Table 4 reports the cross-sectional benchmark estimates from equation (4), i.e. $R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \varepsilon_i$ where country-sector returns R_i are regressed on a constant, a vector of macroeconomic fundamentals X_i (entered here *one at a time*) and the three Fama-French (1992) controls $Z_{i.}$ i.e. the US beta as well as firm size and book-to-market value (which are not reported in the table to save space). Results for the current crisis period are contained in panel A, for a pre-crisis period of 1 January 2005 – 6 August 2007 in panel B. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: The role of country risk in the financial crisis (encompassing model)

Variable:	(1)	(2)	(3)	(4)	(5)
	coef.	coef.	coef.	coef.	coef.
	(std. err.)	*(std. err.)*	*(std. err.)*	*(std. err.)*	*(std. err.)*
A. Macroeconomic fundamentals					
FX reserves	0.515	0.861**	0.779*		
	0.477	*0.423*	*0.399*		
Sovereign rating	0.538	0.924	0.968**		
	0.629	*0.612*	*0.430*		
Current account position	0.780**	0.692*	0.779***		
	0.354	*0.351*	*0.246*		
Government budget	-0.081	0.145			
	0.528	*0.540*			
Interest rate	5.940***	5.248***	5.273***		
	1.578	*1.175*	*1.141*		
Inflation rate	0.119	0.046			
	0.577	*0.592*			
Unemployment rate	-0.112	-0.278			
	0.933	*0.884*			
B. External exposure					
Trade openness	-0.021				
	0.029				
Financial openness	0.008			-0.210	
	0.232			*0.208*	
Equity market capitalisation	0.038**			0.018**	0.019**
	0.016			*0.008*	*0.009*
Exchange rate exposure	-0.051			-0.167	
	0.290			*0.313*	
C. Fama-French controls					
Beta	-0.327***	-0.318***	-0.323***	-0.303***	-0.310***
	0.075	*0.090*	*0.088*	*0.087*	*0.083*
Value	-0.046	-0.052		-0.043	
	0.149	*0.159*		*0.158*	
Size	1.825**	2.258***	2.213***	1.641**	1.718**
	0.753	*0.778*	*0.810*	*0.806*	*0.802*
Observations	432	432	432	432	432
R-squared	0.35	0.32	0.32	0.21	0.21

Notes: Table 5 reports the cross-sectional benchmark estimates from equation (4), i.e. $R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \varepsilon_i$ where country-sector returns R_i are regressed on a constant, a vector of macroeconomic fundamentals X_i (entered here *simultaneously*) and the three Fama-French (1992) controls Z_i, i.e. the US beta as well as firm size and book-to-market value (which are not reported in the table to save space). ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: The role of country risk during the TMT boom-bust cycle and other periods

	Macroeconomic fundamentals										External exposure			
Variable:	FX reserves	Sovereign rating	Current account position	Government budget	Interest rate	Inflation rate	Unemploy-ment rate	Composite country risk	Composite economic country risk	Composite financial country risk	Trade openness	Financial openness	Equity market capitalisatio	Exchange rate exposure
A. During the TMT bust: 1 July 2000 -- 31 Dec. 2001														
Variable:	-0.300	0.463	-0.433	0.744	-0.598	0.377	0.098	-0.020	-0.849*	-0.196	-0.030*	0.151	-0.038**	-0.170
	0.373	*0.455*	*0.277*	*0.642*	*0.588*	*0.321*	*0.299*	*0.240*	*0.498*	*0.469*	*0.016*	*0.348*	*0.014*	*0.375*
Beta	-0.169***	-0.195***	-0.183***	-0.175***	-0.173***	-0.171***	-0.175***	-0.175***	-0.179***	-0.172***	-0.174***	-0.177***	-0.166***	-0.173***
	0.047	*0.051*	*0.045*	*0.046*	*0.046*	*0.043*	*0.045*	*0.044*	*0.044*	*0.043*	*0.044*	*0.045*	*0.044*	*0.045*
Observations	432	432	439	439	439	439	439	432	432	432	432	439	432	441
R-squared	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.15	0.16	0.15	0.15	0.14	0.16	0.15
B. Before the TMT bust: 1 January 1998 -- 30 June 2000														
Variable:	0.337	0.897	0.942	-0.322	0.896	-0.290	-0.003	0.727*	0.541	0.392	-0.018	-0.956**	-0.005	0.189
	0.608	*0.830*	*0.713*	*0.948*	*0.666*	*0.301*	*0.511*	*0.382*	*0.786*	*0.639*	*0.030*	*0.437*	*0.027*	*0.471*
Beta	0.534***	0.496***	0.552***	0.547***	0.551***	0.531***	0.542***	0.493***	0.542***	0.531***	0.544***	0.530***	0.543***	0.532***
	0.108	*0.115*	*0.106*	*0.110*	*0.107*	*0.113*	*0.106*	*0.114*	*0.109*	*0.106*	*0.108*	*0.109*	*0.108*	*0.116*
Observations	435	435	442	442	442	442	442	435	435	435	435	442	435	444
R-squared	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.17	0.16	0.17
C. Extended pre-crisis period: 1 January 1995 -- 6 August 2007														
Variable:	-1.007	2.058*	-0.753	1.956	-0.037	-0.409	0.086	0.693	0.297	1.077	-0.111	0.141	0.025	-0.586
	1.142	*1.137*	*0.943*	*1.852*	*0.149*	*0.346*	*0.707*	*0.700*	*1.423*	*1.086*	*0.067*	*1.263*	*0.032*	*0.693*
Beta	0.868***	0.693***	0.828***	0.827***	0.832***	0.797***	0.831***	0.773***	0.836***	0.795***	0.859***	0.831***	0.822***	0.859***
	0.226	*0.220*	*0.219*	*0.218*	*0.217*	*0.217*	*0.219*	*0.229*	*0.217*	*0.227*	*0.215*	*0.218*	*0.219*	*0.224*
Observations	435	435	442	442	442	442	442	435	435	435	435	442	435	444
R-squared	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Notes: Table 6 reports the cross-sectional benchmark estimates from equation (4), i.e. $R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \varepsilon_i$ where country-sector returns R_i are regressed on a constant, a vector of macroeconomic fundamentals X_i (entered here *one at a time*) and the three Fama-French (1992) controls $Z_{i.}$ i.e. the US beta as well as firm size and book-to-market value (which are not reported in the table to save space). Results for the TMT bust are shown in panel A, for the pre-bust period 1 January 1998 – 30 June 2008 in panel B, and for the whole period before the current crisis in Panel C. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7: The role of sector-level risk in the financial crisis

	External exposure		Financial constraints & demand				
Variable:	Exchange rate exposure	Interest rate exposure	Current ratio	Cash flows	Debt-assets ratio	Sales growth	Investment-fixed assets ratio
A. During the crisis: 7 August 2007 – 15 March 2009							
Variable:	0.010	-0.005	0.002	0.005	0.050	0.002***	-0.000***
	0.011	*0.011*	*0.004*	*0.006*	*0.113*	*0.000*	*0.000*
Beta	-0.267***	-0.264***	-0.247**	-0.255***	-0.274**	-0.262***	-0.260***
	0.093	*0.093*	*0.103*	*0.095*	*0.103*	*0.094*	*0.095*
Observations	441	441	407	437	336	439	401
R-squared	0.17	0.17	0.16	0.16	0.16	0.18	0.2
B. Before the crisis: 1 January 2005 -- 6 August 2007							
Variable:	-0.114***	0.022	-0.618***	-0.008	-0.010*	0.000	0.123
	0.035	*0.024*	*0.066*	*0.018*	*0.005*	*0.000*	*0.118*
Beta	0.264**	0.258**	0.310**	0.280**	0.369***	0.281**	0.328**
	0.115	*0.115*	*0.122*	*0.121*	*0.139*	*0.116*	*0.128*
Observations	444	444	410	439	338	442	403
R-squared	0.13	0.1	0.12	0.1	0.14	0.11	0.12

Notes: Table 7 reports the cross-sectional benchmark estimates from equation (4), i.e. $R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \varepsilon_i$ where country-sector returns R_i are regressed on a constant, a vector of sector-level characteristics X_i (entered here *one at a time*) and the three Fama-French (1992) controls $Z_{i.}$ i.e. the US beta as well as firm size and book-to-market value (which are not reported in the table to save space). ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Linking country risk to portfolio betas

	Macroeconomic fundamentals										External exposure			
Variable:	FX reserves	Sovereign rating	Current account position	Government budget	Interest rate	Inflation rate	Unemploy-ment rate	Composite country risk	Composite economic country risk	Composite financial country risk	Trade openness	Financial openness	Equity market capitalisation	Exchange rate exposure
A. During the crisis: 7 August 2007 – 15 March 2009														
Variable:	0.297	1.681***	-0.128	0.033	-0.397	-1.686***	-0.505	0.570**	-0.510	0.606	0.023	0.415**	0.032***	-0.086
	0.338	*0.493*	*0.202*	*0.397*	*1.237*	*0.499*	*0.382*	*0.245*	*0.522*	*0.393*	*0.021*	*0.170*	*0.010*	*0.603*
Observations	435	435	442	442	442	442	442	435	435	435	435	442	435	444
R-squared	0.16	0.24	0.17	0.17	0.17	0.24	0.17	0.18	0.16	0.17	0.16	0.18	0.17	0.17
B. Before the crisis: 1 January 2005 -- 6 August 2007														
Variable:	0.729*	2.164***	0.059	-0.367	1.200**	-2.722***	-0.406	1.062***	0.049	1.422***	0.033	-0.096	0.064***	0.114
	0.418	*0.510*	*0.257*	*0.451*	*0.463*	*0.562*	*0.312*	*0.282*	*0.603*	*0.428*	*0.023*	*0.185*	*0.020*	*0.667*
Observations	435	435	442	442	442	442	442	435	435	435	435	442	435	444
R-squared	0.14	0.22	0.13	0.14	0.15	0.21	0.14	0.19	0.13	0.17	0.13	0.14	0.16	0.14

Notes: Table 8 reports the results from a regression of the time-varying US beta corresponding to each country-sector equity portfolio on the full set of macroeconomic fundamentals and external exposure variables (entered here one at a time). ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Robustness – Potential endogeneity of country risk and portfolio betas during the financial crisis

	Macroeconomic fundamentals										External exposure			
Variable:	FX reserves	Sovereign rating	Current account position	Government budget	Interest rate	Inflation rate	Unemploy-ment rate	Composite country risk	Composite economic country risk	Composite financial country risk	Trade openness	Financial openness	Equity market capitalisatio	Exchange rate exposure
Variable:														
Level before crisis	0.759*	0.986**	0.557**	0.756	3.414**	-1.251	-0.378	0.775***	1.197**	1.397***	0.001	-0.416**	0.044**	0.041
	0.404	*0.476*	*0.256*	*0.507*	*1.324*	*0.852*	*0.682*	*0.275*	*0.588*	*0.447*	*0.019*	*0.198*	*0.018*	*0.414*
Change during crisis	-81.519	-0.570	0.639	-0.019	2.924*	0.382	2.267	-24.954	18.053	-8.159	9.295	-0.181	-0.055	-45.736
	240.436	*5.230*	*0.950*	*1.225*	*1.538*	*1.237*	*1.932*	*210.075*	*221.800*	*210.803*	*229.491*	*0.195*	*0.043*	*234.659*
Beta:														
Level before crisis	-0.261***	-0.317***	-0.238**	-0.236**	-0.247**	-0.293***	-0.259***	-0.308***	-0.236**	-0.298***	-0.248**	-0.236**	-0.286***	-0.243**
	0.098	*0.098*	*0.098*	*0.101*	*0.098*	*0.106*	*0.091*	*0.096*	*0.095*	*0.101*	*0.099*	*0.099*	*0.093*	*0.096*
Change during crisis	-0.097*	-0.076	-0.093*	-0.117**	-0.100*	-0.089	-0.105*	-0.061	-0.093*	-0.057	-0.109*	-0.102*	-0.095*	-0.109*
	0.057	*0.052*	*0.052*	*0.056*	*0.055*	*0.056*	*0.055*	*0.051*	*0.053*	*0.053*	*0.056*	*0.056*	*0.055*	*0.056*
Observations	432	432	439	439	439	439	439	432	432	432	432	439	432	441
R-squared	0.2	0.21	0.21	0.19	0.22	0.2	0.23	0.23	0.21	0.24	0.18	0.19	0.2	0.18

Notes: Table 9 revisits benchmark equation (4) to address the issue of endogeneity by including both the pre-determined values (measured during the period Q1 2005 to Q2 2007) of the set of explanatory variables, i.e. (i) macroeconomic fundamentals, (ii) external exposure and (iii) time-varying US betas and the *change* in each of these variables during the crisis (from Q2 2007 to the latest available data point available). ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: Robustness – Exclusion of financial sector portfolios

	Macroeconomic fundamentals										External exposure			
Variable:	FX reserves	Sovereign rating	Current account position	Government budget	Interest rate	Inflation rate	Unemploy-ment rate	Composite country risk	Composite economic country risk	Composite financial country risk	Trade openness	Financial openness	Equity market capitalisatio	Exchange rate exposure
A. During the crisis: 7 August 2007 – 15 March 2009														
Variable:	0.753*	1.271**	0.584**	0.688	3.096**	-0.808	-1.177**	0.949***	1.407**	1.629***	0.005	-0.453**	0.020	0.118
	0.425	*0.494*	*0.280*	*0.616*	*1.297*	*0.658*	*0.492*	*0.276*	*0.637*	*0.461*	*0.020*	*0.205*	*0.013*	*0.382*
Beta	-0.254**	-0.327***	-0.234**	-0.245**	-0.239**	-0.281**	-0.264**	-0.310***	-0.228**	-0.296***	-0.248**	-0.229**	-0.262**	-0.236**
	0.104	*0.103*	*0.104*	*0.108*	*0.103*	*0.109*	*0.105*	*0.101*	*0.102*	*0.110*	*0.107*	*0.106*	*0.106*	*0.101*
Observations	371	371	377	377	377	377	377	371	371	371	371	377	371	378
R-squared	0.15	0.18	0.17	0.15	0.17	0.15	0.17	0.21	0.18	0.22	0.14	0.14	0.14	0.14
B. Before the crisis: 1 January 2005 -- 6 August 2007														
Variable:	-1.254*	-1.661	-0.461	-1.074	0.638	1.301	1.435**	-1.103**	0.119	-1.209	0.010	0.207	-0.019	-1.202**
	0.642	*1.019*	*0.462*	*0.808*	*1.123*	*1.617*	*0.624*	*0.457*	*0.998*	*0.809*	*0.038*	*0.355*	*0.027*	*0.555*
Beta	0.325**	0.385***	0.304**	0.299**	0.289**	0.336**	0.325**	0.379***	0.301**	0.350***	0.299**	0.300**	0.313**	0.303***
	0.127	*0.133*	*0.126*	*0.124*	*0.126*	*0.134*	*0.128*	*0.129*	*0.127*	*0.131*	*0.126*	*0.125*	*0.129*	*0.109*
Observations	374	374	380	380	380	380	380	374	374	374	374	380	374	381
R-squared	0.13	0.14	0.12	0.12	0.12	0.12	0.14	0.14	0.12	0.13	0.12	0.12	0.12	0.14

Notes: Table 10 reports the cross-sectional benchmark estimates from equation (4) excluding country portfolios pertaining to the financial sector. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11: The role of financial policies

Variable:	FX reserves		Current account position		Composite country risk		Composite economic country risk		Composite financial country risk	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
A. Deposit guarantees (P)										
Variable X:	0.685*	1.277**	0.535**	0.839***	0.665**	1.105***	1.249***	2.013***	0.963	1.996***
	0.348	*0.560*	*0.222*	*0.302*	*0.326*	*0.394*	*0.462*	*0.526*	*0.592*	*0.590*
Policy P:	10.233**	7.880	9.938**	11.103**	4.361	95.873**	6.088	89.849***	7.961*	113.698***
	4.812	*5.181*	*4.849*	*4.558*	*5.490*	*39.037*	*4.872*	*29.082*	*4.705*	*37.184*
Interaction (X*P)		-1.348**		-1.524**		-1.174**		-2.114***		-2.702***
		0.652		*0.584*		*0.505*		*0.723*		*0.960*
Beta	-0.349***	-0.339***	-0.326***	-0.327***	-0.344***	-0.349***	-0.348***	-0.354***	-0.314***	-0.327***
	0.095	*0.096*	*0.096*	*0.085*	*0.094*	*0.094*	*0.099*	*0.096*	*0.097*	*0.093*
Observations	432	432	439	439	432	432	432	432	432	432
R-squared	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24	0.22	0.22
B. Debt guarantees (P)										
Variable X:	0.670**	1.198**	0.564**	0.693**	0.694**	0.797**	1.283**	1.546***	1.208**	1.192*
	0.334	*0.517*	*0.230*	*0.281*	*0.332*	*0.367*	*0.491*	*0.543*	*0.555*	*0.625*
Policy P:	9.737**	7.201	10.140**	10.486**	4.158	65.815	5.549	61.970	10.111**	6.037
	4.543	*4.863*	*4.469*	*4.454*	*5.378*	*57.859*	*4.831*	*47.091*	*4.434*	*40.983*
Interaction (X*P)		-1.334**		-0.805*		-0.759		-1.384		0.105
		0.576		*0.434*		*0.716*		*1.121*		*1.039*
Beta	-0.360***	-0.343***	-0.343***	-0.334***	-0.351***	-0.350***	-0.353***	-0.357***	-0.341***	-0.342***
	0.097	*0.097*	*0.097*	*0.097*	*0.095*	*0.094*	*0.099*	*0.096*	*0.097*	*0.097*
Observations	432	432	439	439	432	432	432	432	432	432
R-squared	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24	0.22	0.22
C. Capital injections (P)										
Variable X:	0.761*	1.026**	0.585**	0.732***	0.969***	1.005***	1.534***	1.696***	1.335**	1.875***
	0.388	*0.451*	*0.248*	*0.273*	*0.319*	*0.328*	*0.497*	*0.494*	*0.551*	*0.545*
Policy P:	2.772	0.615	1.846	5.832	-5.897	23.509	-2.893	53.055	-2.384	124.040**
	5.412	*5.718*	*5.541*	*5.050*	*6.156*	*87.967*	*5.873*	*73.687*	*5.222*	*54.304*
Interaction (X*P)		-1.518*		-2.406*		-0.358		-1.352		-3.078**
		0.859		*1.246*		*1.038*		*1.703*		*1.292*
Beta	-0.296***	-0.287***	-0.269***	-0.302***	-0.301***	-0.302***	-0.299***	-0.308***	-0.243**	-0.274***
	0.098	*0.098*	*0.098*	*0.089*	*0.094*	*0.093*	*0.100*	*0.096*	*0.098*	*0.092*
Observations	432	432	439	439	432	432	432	432	432	432
R-squared	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24	0.22	0.22

Notes: Models (1) are based on eq. (5) $R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \mu_3 P_i + \varepsilon_i$ while models (2) are based on eq. (6) $R_i = \mu_0 + \mu_1 X_i + \mu_2 Z_i + \mu_3 P_i + \eta (X_i P_i) + \varepsilon_i$. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively. The models are estimated for the crisis period 07 August 2007 – 15 March 2009.

Table 12: Global transmission of common US shocks during the crisis

	Non-US returns					US market returns				
	before crisis		during crisis			before crisis		during crisis		
	coef.	*std. err.*	coef.	*std. err.*	*signific.*	coef.	*std. err.*	coef.	*std. err.*	*signific.*
Crisis events	--		0.928***	*0.151*		--		4.884***	*0.501*	
US macro news:										
GDP	0.175**	*0.085*	1.158***	*0.291*	0.01	-0.094	*0.536*	3.317*	*1.876*	0.09
Consumer confidence	0.014	*0.123*	0.876***	*0.262*	0.01	3.415***	*0.877*	7.705***	*1.28*	0.96
Housing starts	-0.201***	*0.044*	1.030***	*0.268*	0.00	0.014	*0.313*	0.271	*1.267*	0.85
Industrial production	0.056**	*0.024*	0.332***	*0.051*	0.00	0.082	*0.172*	0.724***	*0.202*	0.01
NAPM / ISM	0.051	*0.045*	0.383**	*0.158*	0.04	-0.254	*0.277*	2.132***	*0.714*	0.01
NF payroll employment	0.193***	*0.035*	0.470***	*0.176*	0.14	0.465**	*0.217*	-0.517	*0.507*	0.11
Retail sales	0.056*	*0.028*	0.990***	*0.105*	0.00	0.095	*0.18*	1.717***	*0.398*	0.01
Trade balance	-0.219*	*0.118*	0.221	*0.191*	0.09	0.096	*0.807*	0.069	*1.471*	0.98
Unemployment	-0.483*	*0.282*	-1.753***	*0.372*	0.01	0.086	*1.948*	-5.947**	*2.352*	0.10
Workweek	-0.06	*0.058*	0.411*	*0.245*	0.07	-0.187	*0.412*	1.219	*1.21*	0.30
Observations	156631		60020			355		488		
R-squared	0		0.02			0.02		0.26		

Notes: Table 12 reports estimates from eq. (7), i.e. $R_{i,t} = \alpha + \beta_1 S_t^{crisis} + \beta_2 S_t^{news} + \mu_1 X_{i,t} + \mu_2 Z_{i,t} + \varepsilon_{i,t}$ where, for each day *t*, S_t^{crisis} and S_t^{news} are the respective vectors of six key US crisis events (such as the failure of Bear Stearns or Lehman Brothers) and of US macro news; *X* includes the fundamentals previously identified as important to explain the heterogeneity of country-sector portfolio returns during the crisis (i.e. FX reserves, sovereign rating and the current account balance), and *Z* includes as before the US beta and the other two Fama-French (1992) controls. Estimated parameters for both *X* and *Z* are not reported here to save space. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 13: Global transmission of common US shocks during the crisis – difference-in-difference approach
Comovement with US markets (beta)

Beta -- comovement with US	**Crisis & beta**	**Crisis**	**Beta**	**Common effect**	**Crisis & high beta**	**No crisis & high beta**	**Crisis & low beta**
	δ_1	γ_1	γ_2	β_1	$(\beta_1+\gamma_1+\gamma_2+\delta_1)$	$(\beta_1+\gamma_2)$	$(\beta_1+\gamma_1)$
Crisis events	--	--	1.091** *0.418*	0.403 *0.26*	1.494 *** *0.250*	--	0.403 *0.260*
US macro news:							
GDP	1.662*** *0.602*	0.186 *0.421*	-0.161 *0.145*	0.245*** *0.087*	1.932 *** *0.395*	0.084 *0.137*	0.431 *0.418*
Consumer confidence	1.137** *0.568*	0.277 *0.332*	0.466** *0.226*	-0.184 *0.113*	1.696 *** *0.389*	0.282 *0.216*	0.093 *0.315*
Housing starts	0.967* *0.503*	0.786** *0.332*	-0.202** *0.092*	-0.114** *0.053*	1.436 *** *0.395*	-0.317 *** *0.073*	0.671 ** *0.318*
Industrial production	0.420*** *0.1*	0.073 *0.076*	0.048 *0.044*	0.036 *0.028*	0.577 *** *0.067*	0.084 ** *0.036*	0.109 *0.068*
NAPM / ISM	1.531*** *0.343*	-0.411* *0.221*	0.135 *0.087*	-0.007 *0.065*	1.249 *** *0.231*	0.128 ** *0.058*	-0.417 * *0.226*
NF payroll employment	0.454 *0.379*	0.038 *0.137*	0.292*** *0.058*	0.071** *0.034*	0.856 ** *0.340*	0.364 *** *0.052*	0.110 *0.133*
Retail sales	1.387*** *0.183*	0.286** *0.124*	0.085* *0.048*	0.019 *0.036*	1.777 *** *0.126*	0.104 *** *0.037*	0.305 ** *0.125*
Trade balance	-0.526 *0.589*	0.697** *0.277*	-0.217 *0.249*	-0.126 *0.119*	-0.172 *0.325*	-0.343 *0.224*	0.571 ** *0.281*
Unemployment	-3.854*** *1.118*	0.552 *0.687*	-0.749* *0.412*	-0.141 *0.335*	-4.192 *** *0.643*	-0.890 ** *0.360*	0.411 *0.538*
Workweek	1.761** *0.688*	-0.336 *0.299*	-0.114 *0.101*	-0.013 *0.072*	1.297 ** *0.530*	-0.127 *0.082*	-0.350 *0.276*

Notes: Table 13 reports estimates from a version of equation (8) which focuses on the US beta, i.e:

$$R_{i,t} = \alpha + \beta_1 S_t + \beta_2 D_t + \beta_3 Z_{i,t} + \gamma_1 (S_t * D_t) + \gamma_2 (S_t * Z_{i,t}) + \gamma_3 (D_t * Z_{i,t}) + \delta_1 (S_t * D_t * Z_{i,t}) + \varepsilon_{i,t}$$

where $D_t = 1$ during the crisis and $D_t = 0$ otherwise, $Z_{i,t}$ contains only the US beta estimated in equation (1) and where S contains the respective vectors of six key US crisis events (such as the failure of Bear Stearns or Lehman Brothers) and of US macro news. The OLS estimator takes into account clustering across residuals by country. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 14: Global transmission of common US shocks during the crisis – *difference-in-difference approach*
FX reserves

FX reserves	**Crisis & fundamentals**		**Crisis**		**Fundamentals**		**Common effect**		**Crisis & good fundamentals**		**No crisis & good fundam.**		**Crisis & poor fundamentals**	
	δ_1		γ_1		γ_2		β_1		$(\beta_1+\gamma_1+\gamma_2+\delta_1)$		$(\beta_1+\gamma_2)$		$(\beta_1+\gamma_1)$	
Crisis events	--		--		0.070***	*0.02*	1.089***	*0.151*	1.159 ***	*0.156*	--		1.089 ***	*0.151*
US macro news:														
GDP	-0.008	*0.057*	1.014***	*0.348*	0.004	*0.021*	0.181*	*0.103*	1.191 ***	*0.336*	0.185	*0.116*	1.195 ***	*0.315*
Consumer confidence	-0.082	*0.051*	0.708***	*0.266*	0.001	*0.025*	0.018	*0.137*	0.645 **	*0.264*	0.018	*0.149*	0.726 ***	*0.256*
Housing starts	0.039	*0.054*	1.321***	*0.288*	-0.011	*0.007*	-0.230***	*0.045*	1.119 ***	*0.289*	-0.241 ***	*0.048*	1.091 ***	*0.274*
Industrial production	-0.008	*0.012*	0.261***	*0.062*	-0.003	*0.004*	0.054**	*0.025*	0.303 ***	*0.062*	0.051 *	*0.026*	0.315 ***	*0.057*
NAPM / ISM	0.032	*0.032*	0.421***	*0.145*	0.003	*0.008*	0.052	*0.046*	0.508 ***	*0.156*	0.054	*0.048*	0.473 ***	*0.148*
NF payroll employment	-0.021	*0.062*	0.245	*0.248*	0.001	*0.008*	0.198***	*0.034*	0.423	*0.282*	0.198 ***	*0.036*	0.443 *	*0.238*
Retail sales	-0.013	*0.02*	0.924***	*0.1*	-0.007	*0.005*	0.044*	*0.026*	0.949 ***	*0.111*	0.037	*0.027*	0.968 ***	*0.104*
Trade balance	-0.027	*0.052*	0.36	*0.257*	0.024	*0.02*	-0.143	*0.118*	0.215	*0.212*	-0.119	*0.123*	0.217	*0.199*
Unemployment	-0.264***	*0.087*	-1.854***	*0.464*	0.1	*0.07*	-0.287	*0.262*	-2.305 ***	*0.468*	-0.187	*0.283*	-2.141 ***	*0.415*
Workweek	0.038	*0.087*	0.563*	*0.323*	-0.014	*0.009*	-0.096	*0.062*	0.491	*0.368*	-0.110 *	*0.066*	0.467	*0.311*

Notes: Table 14 reports estimates from a version of equation (8) which focuses on the FX reserves, i.e:

$$R_{i,t} = \alpha + \beta_1 S_t + \beta_2 D_t + \beta_3 X_{i,t} + \gamma_1 (S_t * D_t) + \gamma_2 (S_t * X_{i,t}) + \gamma_3 (D_t * X_{i,t}) + \delta_1 (S_t * D_t * X_{i,t}) + \varepsilon_{i,t}$$

where D_t = 1 during the crisis and D_t = 0 otherwise, $X_{i,t}$ includes FX reserves and where S contains the respective vectors of six key US crisis events (such as the failure of Bear Stearns or Lehman Brothers) and of US macro news. The OLS estimator takes into account clustering across residuals by country. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 15: Global transmission of common US shocks during the crisis – *difference-in-difference approach*
Current account position

Current account position	**Crisis & fundamentals** δ_1		**Crisis** γ_1		**Fundamentals** γ_2		**Common effect** β_1		**Crisis & good fundamentals** $(\beta_1+\gamma_1+\gamma_2+\delta_1)$		**No crisis & good fundam.** $(\beta_1+\gamma_2)$		**Crisis & poor fundamentals** $(\beta_1+\gamma_1)$	
Crisis shocks	--		--		0	*0.011*	0.938***	*0.152*	0.938 ***	*0.151*	--		0.938 ***	*0.152*
US macro news:														
GDP	0.008	*0.031*	0.984***	*0.306*	0.012	*0.008*	0.172**	*0.084*	1.177 ***	*0.293*	0.184 **	*0.086*	1.156 ***	*0.294*
Consumer confidence	-0.025	*0.029*	0.885***	*0.271*	-0.006	*0.02*	0.016	*0.122*	0.870 ***	*0.261*	0.010	*0.124*	0.901 ***	*0.260*
Housing starts	-0.038	*0.037*	1.243***	*0.286*	0.009	*0.006*	-0.213***	*0.042*	1.001 ***	*0.274*	-0.205 ***	*0.043*	1.030 ***	*0.270*
Industrial production	0.003	*0.009*	0.276***	*0.054*	-0.002	*0.004*	0.057**	*0.023*	0.334 ***	*0.053*	0.055 **	*0.024*	0.334 ***	*0.051*
NAPM / ISM	0.034	*0.022*	0.323**	*0.151*	-0.004	*0.007*	0.051	*0.043*	0.405 **	*0.160*	0.048	*0.045*	0.375 **	*0.154*
NF payroll employment	-0.034*	*0.019*	0.294	*0.18*	0.011*	*0.006*	0.187***	*0.033*	0.457 **	*0.179*	0.197 ***	*0.033*	0.481 ***	*0.172*
Retail sales	0.007	*0.013*	0.938***	*0.095*	0.002	*0.004*	0.054*	*0.028*	1.000 ***	*0.106*	0.056 **	*0.028*	0.991 ***	*0.105*
Trade balance	-0.039*	*0.023*	0.451*	*0.256*	0.012	*0.016*	-0.226*	*0.12*	0.199	*0.190*	-0.214 *	*0.118*	0.226	*0.191*
Unemployment	0.017	*0.037*	-1.282***	*0.455*	-0.02	*0.032*	-0.482*	*0.276*	-1.767 ***	*0.382*	-0.502 *	*0.283*	-1.764 ***	*0.374*
Workweek	0.049	*0.041*	0.451*	*0.252*	-0.007	*0.006*	-0.056	*0.057*	0.437 *	*0.256*	-0.063	*0.059*	0.395	*0.239*

Notes: Table 15 reports estimates from a version of equation (8) which focuses on the current account position, i.e:

$$R_{i,t} = \alpha + \beta_1 S_t + \beta_2 D_t + \beta_3 X_{i,t} + \gamma_1 (S_t * D_t) + \gamma_2 (S_t * X_{i,t}) + \gamma_3 (D_t * X_{i,t}) + \delta_1 (S_t * D_t * X_{i,t}) + \varepsilon_{i,t}$$

where $D_t = 1$ during the crisis and $D_t = 0$ otherwise, $X_{i,t}$ includes the current account position and where S contains the respective vectors of six key US crisis events (such as the failure of Bear Stearns or Lehman Brothers) and of US macro news. The OLS estimator takes into account clustering across residuals by country. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.