Emerging economies in the 2000s:
Real decoupling and financial recoupling

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Abstract

The paper documents an intriguing development in the emerging world in the 2000s: a decoupling from the business cycle of advanced countries, combined with the strengthening of the comovements in the main emerging market assets that predates the synchronized selloff during the crisis. The paper tests the hypothesis that financial globalization, to the extent that it creates a common, global investor base for EM, could lead to a tighter asset correlation despite the weaker economic ties. However, a close look at the impact of alternative globalizations proxies yield no conclusive result.

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1. Introduction

Emerging markets (EM) advocates often emphasize their newly gained resilience to external shocks. Resilience, however, can be interpreted in several ways. In particular, it is expected to manifest differently according to whether it refers to economic performance, market interdependence, or the link between markets and economic activity. In this paper, we revisit the debate surrounding the different varieties of EM decoupling to document the recent behavior (both in the pre crisis bonanza and turbulent crisis period) on these three fronts, discuss the economic factors underlying the specific patterns in each case, and draw market and policy implications from these findings.

In particular, I examine decoupling: (i) in the traditional sense, namely, business cycle synchronicity and sensitivity to the world economy (real decoupling); (ii) as cross-market financial interdependence (financial decoupling), in the sense of the "betas" of EM credit, equity and currency returns to returns on the global market portfolio, as well as within-EM betas (a typical feature of the 90s); and (iii) as the link between growth, on the one hand, and cross-border flows and, in turn, assets prices such as sovereign spreads, exchange rates and equity returns, on the other (real-financial decoupling).

The discussion is centered on EM assets. More specifically, we look at a sample of countries that represents what is usually labeled as emerging markets in the financial industry, following the Morgan Stanly Capital Index benchmark (MSCI) for individual countries and groups of countries, and focus our analysis on equity and, to a lesser extent, currency and hard currency sovereign bonds. As a comparison group, I include in the study five non-euro peripheral markets: Australia, Canada, New Zealand, Norway and Sweden.

I find that: (i) on the real front, rather than actually decoupling from the world, EM have diversified away from the US and the euro zone into emerging Asia (through international trade and the growing economic importance of China); (ii) on the market front, despite the real decoupling, the comovement between EM and global assets (as measured by the EM betas to developed markets return) have risen in the late 2000s, even before the 2008-2009 crisis, and (iii) the real-financial interaction (namely the incidence of asset performance on the real economy) remains: despite the lower EM dependence on hard-currency external finance (reflected in a lower impact of sovereign spreads), currency and equity fluctuations do preserve their influence on economic activity.

Why has real decoupling not provided more "room" for assets from fundamentally sound EM to decouple as well? A priori, financial globalization (FG), to the extent that it internationalized EM´s investor base, could be the explanation for the tighter comovement (as suggested, e.g., by Didier et al., 2010 for a broader country sample). However, a closer look at the impact of alternative FG proxies yield no conclusive result.

To test this hypothesis, I proceed in two steps. First, I compare alternative measures of financial globalization, based on both external liability positions and gross cross-border flows for our sample of emerging economies. Next, I use these proxies to evaluate whether EM betas are indeed correlated with FG, both over time and cross country. I find that, if anything, global holdings of EM stocks helped reduce betas in the late period.

The paper is organized as follows. Section 2 compares alternative definitions of EM. Section 3 examines real decoupling. Section 4 looks at credit, equity and currency betas over time to document the financial recouping in recent years. Section 5 estimates the effects of asset price movements on economic activity. Section 6 explores the link between EM betas and alternative measures of FG. Finally, section 7 summarizes the results and concludes.

2. A map of the emerging world

While the buzzword "emerging", alternatively attached to markets and economies, has been around for 30 years, the connotation of the term has changed dramatically over time.[2] From an empirical perspective, as we emphasized in our first AEM piece, emerging markets came into their own as an asset class only in the early 1990s, as the post-Bretton Woods financial globalization trend that consolidated in advanced countries in the 1980s moved on to the developing world.[3] Therefore, evaluating their performance starting in the early 1980s (when many EM did not even exist as national entities) could be greatly misleading. Instead, in line with our view that the structural changes that motivate the AEM category took place in the past decade, we choose a short sample and focus our examination on the 2000s.

The fact that "emerging" often denotes financial and economic aspects interchangeably opens the door for some divergence in the way the EM group is populated. There are several criteria

[2] As the story goes, the IFC staffer Antoine van Agtmael coined the term in 1981 to elude the negative connotation of the then popular "third world" label, at a time at which there was practically no foreign portfolio investment in those markets.

[3] *Obstfled and Taylor (2002)* provide a useful historical perspective.

according to which emerging economies can be identified and classified including: geography (acknowledging the incidence of regional ties) as in the many regional EM equity indexes; economic development (typically proxied by national income); and market infrastructure (often associated with one specific market), as in the FTSE classification, or economic size and geopolitical influence, as in the BRIC category[4] Moreover, the conventional (but often disputed) growth convergence view would suggest a negative correlation between growth upside and income (often used to screen advanced from emerging economies). A casual examination of the link between per capita GDP and IMF growth forecasts points in the same direction – although, interestingly, AEM countries are expected to grow faster than EM even after controlling for per capita income (**Figure 1**).

At any rate, a quick glance at different EM groupings reveals mostly coincidences in the broad breakdown (advanced emerging frontier), but some important differences within the EM tier (**Table 1**). Singapore and sometimes South Korea are regarded as advanced based on income and stock market development, although they are still treated as emerging for fixed income industry analysts. On the other corner, Chile's low income and less-than-stellar equity markets understate its economic progress and its developed bond market.

We do not intend to settle this semantic question in this series. Rather, as shown in Figure 1, I use here a standard EM grouping and, in some cases, distinguish "advanced" EM (AEM: Singapore, Chile, Korea, Taiwan, Israel, China, Brazil, South Africa, Poland, and the Czech Republic) based on the country's capacity and ability to sustain stable growth (see Levy Yeyati et al., 2009). In addition, for some exercises we look at five peripheral core economies (PCE): Australia, Canada, NZ, Norway, Sweden, as a reference group.

[4] Along the same lines, newly industrialized countries (NICs) is a category between developed and developing countries, which includes Brazil, the People's Republic of China, India, Malaysia, Mexico, Philippines, South Africa, Thailand and Turkey.

3. Real decoupling and growth convergence

One of the arguments often used by emerging markets (EM) advocates highlights that, because of the natural diversification in the sources of economic growth (due to increased openness and globalization) or because of structural changes and policy improvements, emerging economies have become more resilient to changes in the global context (see. E.g., The Economist, 2009). If, in the 1990s, whenever the world caught a cold EM got pneumonia, past financial crises would have immunized emerging economies so that, if anything, when in 2008 the G7 got pneumonia, EM just got a cold.

However, the popular decoupling argument is both less straightforward and more controversial than what its narrative suggests. For starters, real decoupling has two distinct interpretations: as business cycle synchronicity (in the sense of globally synchronized expansions and recessions) and output sensitivity (somewhat closer in nature to the "cold" analogy).

Interestingly, the correlation of business cycles, the measure of decoupling that became standard in the economic literature, mixes sensitivity and amplitude. For example, the correlation between EM and G7 output, $\rho_{EM,G7} = \beta_{EM,G7} (\sigma_{EM} / \sigma_{G7})$ can increase with the beta between the two as well as with the ratio of output volatilities. Thus, the Great Moderation of the pre-crisis period (to the extent that it reduced σ_{G7}) and a home-grown EM crisis (to the extent that it rises σ_{EM}) could increase the correlation even if the beta between the two countries remains unaltered.[5] On the other hand, pure synchronicity measures (see, e.g., Mink and de Haan, 2007), while closer to the canonical definition of decoupling, are silent about the economic relevance of the connection.

At any rate, results using these measures are rather disappointing, as evidence of decoupling is seldom found: if anything, the 2000s seems to have witnessed an increase in the correlations of EM and G7 cycles (**Figure 2**).[6] By contrast, with a few exceptions, EM have been exhibiting growth outperformance that, according to most forecasts, will continue in the next few years (**Figure 3**).

[5]The same caveat applies to a comparison of the explanatory power of time-varying global factors based on the R^2 (as in Kose et al., 2007) since $R^2_{EM,G7} = \rho^2_{EM,G7}$.

[6] HP filtered output growth yields remarkably similar results. *Rose* (2009) reports and discusses different versions of this exercise. *Walti* (2009) applies *Mink and de Haan's* (2007) synchronicity measure based on the product of output gaps: $(gap_i/|gap_i|)*(gap_j/|gap_j|)$ which is equal to sign $(gap_i * gap_j) *1$, for the two-country or two-region case.

Sensitivity to global shocks is a key aspect of decoupling from the perspective of the risk associated to EM assets, where we care as much about how much EM volatility would result from a given global shock as the timing of the response. It is also critical in the context of the new EM debate (namely, the degree of progress the main emerging economies have made since the financially challenging 1990s). After all, if a global crisis, by definition, hits everybody, EM resilience and quality cannot be judged by the fact that they responded to last year's global shock, but rather by how much and for how long. The natural way to test whether EM sensitivity to global growth has declined over the years is to regress EM growth on G7 growth and evaluate how the coefficients (EM growth "betas" to the developed world) have evolved since the inception of EM as an asset class in 1993. Splitting the sample in an early (1993-99) and a late (2000-09) period, and assuming for simplicity that trend growth remained stable within each sub-period, the specification is simple enough:

$$dlog(GDP_{it}) = \alpha + \beta_1\, dlog(GDP\_G7_t) + \beta_2\, dlog(GDP\_G7_t) * dummy_{2001\text{-}2009} + \beta_3\, dlog(GDP\_China_t)$$

$$+ \beta_4\, dlog(GDP\_China_t) * dummy_{2001\text{-}2009}\, \mu_{it,}$$

a regression of the q/q growth rate of country *i*'s cyclical output (relative to a log linear GDP trend) on the G7 and Chinese cycles, based on quarterly, seasonally adjusted GDP data, identifying the late period (2001-09) with an interacting dummy. In passing, such a specification also allows us to estimate the long-term growth convergence (the EM "alphas") as the constant of the regression.

Note that we deliberately exclude China from the EM sample. For sheer size and growth dynamics, China represents a class in itself that, if grouped with other EM, could bias the conclusions of this exercise (as it does, most notably, in the typical analysis of EM aggregate output). Indeed, it remains a global driver that should be treated as an additional exogenous force behind EM growth and, thus, be included as an additional control, as we do here.

Table 2 summarizes the results. The first thing to note is the fact that emerging economies display mostly "positive alphas" relative to the G7 group: an average 2.8% growth differential per year over the whole period, roughly in line with the back-of-the-envelope illustration in **Figure 3**. Is the elusive growth convergence finally materializing in the emerging world? While it is still far too early to judge, at first glance their relative growth performance is not inconsistent

with the convergence view, not only vis a vis developed economies but, most strikingly, whithin the emerging group as well (**Figure 4**).

Regarding decoupling per se, in the traditional specification in which global growth is represented by the G7, the EM betas appear stable and high. In other words, there seems to have been no decoupling in the past decade, a finding mostly in line with the results in the recent economic literature (Rose, 2009; Wälti, 2009). Indeed, judging by the median results for the interaction coefficient and p-values, G7 growth appears to have *increased* its explanatory power over the late period (column 1).[7]

However, the data paint a different picture once we include China as a separate control: the explanatory power of the G7 virtually disappears in the latest period, at the expense of the Chinese influence (column 2).[8] Reassuringly, the explanatory power of the new specification is significantly larger in all cases –particularly, as expected, in Asian economies and commodity exporters.[9] In other words, the "coupling", understood as sensitivity to global growth, continues to be there –but it seems to have moved to the Far East. Predictably, an important share of the renewed resilience of EM due to the China factor is explained by the positive effect of the surge in commodity prices (columns 3), in turn associated with Chinese growth (columns 4). The same conclusions can be drawn from the country-by-country regressions (median figures of which are reported in columns 6 to 8 in the table).

The finding that China has increased (and therefore helped diversify) the global influence on open economies is less trivial once we compare with our sample of non-euro advanced economies, which show the negative of EM: a weak China effect and a global influence that appears to have strengthened over time (columns 9 and 10).

4. Financial recoupling

A common misperception among EM advocates and practitioners is the idea that the newly gained policy autonomy and macroeconomic resilience to external shocks have enhanced the

[7] The explanatory power of G7 growth also increases markedly over time: dropping the interaction and splitting the sample, we obtain an average R^2 for the late period of 0.28, against 0.06 for the early period.

[8] This pattern does not depend on the assumption of a constant linear trend: de-trending output using the standard Hodrick-Prescott filter and estimating betas and alphas on the growth rate of the cycle yield roughly the same conclusion.

[9] Country-by-country results are available on request.

importance of a country's fundamentals as drivers of asset performance – a view typically contradicted by the data, which reveal a steady influence of global factors and persistently high betas.[10]

Have the betas of EM assets to global assets come down in recent years? This is readily illustrated by a back-of-the-envelope estimation of betas relative to standard global proxies for each of the relevant markets. Specifically, we run country-by-country regressions of monthly log changes in MSCI country equity indexes and exchange rates on log changes in the S&P 500 and DXY indexes, and log credit spreads on US HY corporate spreads, respectively, to estimate alphas and betas as the ordinate and the coefficient from the regressions.[11] We focus on two time periods: early (2001-04) and late (2005-09), and we split the latter into a tranquil period (2005-2007) and the crisis (2008-09). We replicate the exercise for quarterly and annual changes to examine whether longer time horizons enhance the effect of fundamentals at the expense of global markets.

As **Figure 5** clearly show, betas have remained persistently high in the second half of the 2000s, even as we lower the sampling frequency to allow for short-term co-movement to dissipate (**Table 4** report the group medians; see also **Tables A1 to A3** in the Appendix for individual country results). Equities betas have remained close to 1, while credit betas (sovereign bond spreads vis a vis high yield corporate spreads in advance countries) and exchange rate betas have generally increased. Interestingly, this change in global betas is not idiosyncratic to EM, as it also applies to the five peripheral core economies in our sample, which exhibit betas not far from the average advanced EM.[12]

Is this tight comovement the result of the sharp synchronized selloffs during episodes of global distress? More generally, is this evidence the result of technical contagion and panic, rather than the reflection of international arbitrage by the global investor? The preliminary answer from the tables is negative: betas increased in the tranquil years of late period, before the

[10] Much as in the case of real decoupling discussed above, the drawbacks of using standard correlations to estimate market interdependence have been repeatedly highlighted in the finance literature, most notably Rigobón (2002).

[11] We use the S&P, DXY and US HY instead of broader global indexes to be able to estimate alphas and betas for the peripheral core markets we used for comparison in the previous piece of this series. Estimating equity betas to the global MSCI yields comparables results. We choose MSCI equity indexes to local stock market indexes to concentrate on the more liquid, globally traded stocks used in cross-border operations.

[12] Sovereign debt in core economies is largely domestic and denominated in local currency, hence not directly comparable with EM credit.

beginning of the 2008-2009 crisis. This finding is confirmed by a simple test to distinguish between responses to positive and negative changes in global factors:

$$MSCI_i = \alpha + \beta_{pos} * d\log(SP)_+ + \beta_{neg} * d\log(SP)_-$$
$$spread_i = \alpha + \beta_{pos} * d\log(HY)_+ + \beta_{neg} * d\log(HY)_-$$

and

$$ER_i = \alpha + \beta_{pos} * d\log(-DXY)_+ + \beta_{neg} * d\log(-DXY)_-$$

Results, although mixed, indicate that high betas are not a sell-off phenomenon. Only for currencies was the response to negative shocks significantly higher than that for positive shocks in a relevant share of countries. Interestingly, credit betas appear to be *lower* for negative shocks, although this may be masking the fact that emerging credit ratings improved, and their sensitivity to bouts of global risk aversion declined, over the latest period, which happens to be the one characterized by the sharpest negative corrections in global credit (**Table 5: tables A4 to A6 in the Appendix report results for individual countries**).

5. Do we care about excess asset volatility? The real-financial link

Policy makers tend to care about volatility in asset prices only insofar as it affects important real variables such as investment, consumption an, ultimately, economic growth. In the emerging world of the 80s and 90s, financial crisis inevitably triggered sharp, and in some cases long-lived economic stagnation, as sudden jumps in exchange rates and sovereign spreads and led currency mismatched economies dependent on external finance at the brink of default.

The dedollarization and deleveraging process in EM in the 2000s begs the question about the extent to which asset volatility determines economic outcomes. To shed some light on this real-financial link, I additionally control for equity quarterly returns (lagged to mitigate simultaneity concerns), a standard FX market pressure index, and the sovereign credit spread, in the growth model used in of Table 2, column 2.[13] Results are presented in **Table 5**. As can be seen in columns 1 and 2, credit spreads seem to have lost its bite at the expense of the exchange rate

[13] The FX market pressure is computed as the sum of the log change in the exchange rate and the reserve loss, weighted by the inverse of their respective volatilities over the sample used in the regressions.

pressure and the stock market, both of which remain a significant short-term influence on economic activity.[14]

We obtain the same results by redoing the exercise in two steps, by estimating residuals from the original growth model on global growth, and running them on asset returns (columns 3 to 8), The same is valid when sovereign spreads are replaced by the (arguably exogenous) high yield corporate spread (column 9).

6. Financial recoupling and financial globalization

Why have market betas to global drivers remained so high despite the more diversified economic pattern displayed by EM in the 2000s? In principle, stable to higher betas could be seen as the natural consequence of financial globalization, to the extent that the latter tends to increase the global nature of EM´s investor base, thereby making it more homogeneous. In this section, we explore this hypothesis, focusing primarily on equities, in principle the assets that should reflect economic performance more closely, and where the real decoupling-financial recoupling contrasts is more puzzling.

Much in the same way as dedicated EM investors responded vis a vis EM as a single asset class in the 1990s (inducing financial contagion even in the absence of clear economic ties), in recent years international investors have treated risky assets (EM and elsewhere), preserving or even increasing the betas, particularly in financially open economies where financial globalization became more intense. As the global investors increasingly participate in these markets (**Figure 6**), the importance of global factors coming from the developed world increases at the expense of within-EM factors that represented the typical source of contagion in the 1990s.

On the other hand, up until the 2008 crisis, assets prices have been exhibiting a clear high-beta, high-alpha pattern (**Figure 7**); in other words, a tightly correlated oscillation around clearly diverging trends. Indeed, it is in the alphas (the long-run diverging trends in asset prices) where we finally find some influence of economic fundamentals, particularly economic growth prospects, as we show next.

[14] Note that, as documented in the literature, currency and credit risk were highly correlated in the early period, hence the sign change of the currency control in column 2.

a. Growth and stocks[15]

The link between stocks and growth offer a good example. A first look at this link during the boom-bust-recovery cycle since 2005 appears to support this view: the total equity return is significantly and positively correlated with cumulative per capita growth during the period.[16] A percentage point difference in growth was associated with roughly an 8% equity return differential. The link remains intact if we "filter out" the influence of market movements: growth is strongly correlated with the country-specific alphas of equity returns (Error! Reference source not found.). However, stock prices react not to contemporaneous (realized) growth but to growth expectations that influence corporate earnings forecasts and are therefore internalized in anticipation by the market. A rigorous analysis of the stock-growth connection needs to show a link between equity returns and growth prospects.

Estimating expectations is never easy because they are unobservable, tend to diverge across market investors and vary significantly over time. Here, we calibrate them in two ways. First, we estimate them country by country using a simple two-stage error correction model of annual growth rates:

(1) $\ln(gdp_t) = \alpha_1 + \beta_1 \ln(gdp_{t-1}) + \mu_t$

(2) $dln(gdp_t) = \alpha_2 + \beta_2 EC_{t-1} + \beta_3 dln(gdp_{t-1}) + \varepsilon_t$

where $EC_{t-1} = \ln(gdp_t) = \ln(gdp_{t-1}) - [\alpha_1 + \beta_1 \ln(gdp_{t-2}) + \mu_{t-1}]$ is the error correction term, and μ_t and ε_t are error terms.

In turn, we define expected growth and growth surprises as the fit and the residual from equation (2), and regress equity returns on the expected component, including, alternatively, year dummies or S&P returns to control for common global drivers, for 2000-09.[17] Given the annual frequency of the data, one could argue that this year's expected growth has been in part anticipated and priced in last year's returns, which would detract from the overall effect of expected growth on equity performance. To control for that, we also run the tests using the first lead of the fitted growth

[15] This section borrows from Levy Yeyati et al. (2010).
[16] Note that since the charts are done with log changes, the cumulative rates are proportional to period averages. The sample used in the charts is the same as in our previous piece: emerging economies plus five non-euro core peripheral developed countries (Australia, Canada, New Zealand, Norway and Sweden).

series (to proxy today's forecast of tomorrow's growth rate). Alternatively, we use end-of-year market consensus expectations for growth next year to further check whether the stock-growth link exhibit the right direction of causality (from market views to prices). [18]

The results, reported in **Table 6**, are reassuringly stable across models, and strongly suggest that, once the test is properly specified, there is a link between stock returns and growth expectations: an additional percentage point growth rate is associated with returns that are roughly 5% higher (in line with the crude cotemporaneous exercise of **Figure 8**).

b. Financial globalization: What do we talk about?

How has FG evolved for EM in the past 10 years? To start exploring this question, the first thing to note is that, despite being the subject of a rich and growing literature, the concept of FG has been defined in various, often uncorrelated ways in the academic work.[19]

A succinct list of FG proxies would include several de jure measures based on regulations, restrictions and controls over capital flows and asset ownership, typically based on the IMF´s AREAR (see Kaminsky and Schmukler, 1998, Quinn and Inclan 1997, Chinn & Ito, 2007) or the IFC´s equity globalization index that measures the ratio of equity market capitalization that is investable for non residents (Bekaert and Harvey, 1998). While all of these measures are predictably close to each other when applied to a particular financial market, they differ across markets in a way that complicates the definition of a financially globalized economy.[20]

On the other hand, the extent to which globalization affects asset prices and, more generally, economic performance is related to the actual intensity of the cross border flows, regardless of existing controls. For example, many tightly regulated economies are the recipients and sources of important capital flows (and are therefore financially globalized), whereas other control-free

[17] Reassuringly, the link with the unexpected component is not significant. Note that the exercise is similar to regressing alphas on growth, under the assumption of a common beta to the S&P.

[18] In addition, the use of consensus expectations (sourced from Bloomberg) as opposed to realized growth should dispel concerns about causality, namely, the possibility that a solid stock performance actually causes growth as much as it reflects it.

[19] In what follows, for conciseness we focus primarily on equities, where betas have been more consistently high, but the results are easily generalized to currencies.

[20] For instance, one country may choose to restrict access to stocks but let the fixed income markets (debt, currency derivatives) relatively untouched, leading to very different FG scores depending on the de jure measure of choice.

economies are shunned by international investors and, as a result, are isolated from global market swings and trends.

The distinction between *de jure* and *de facto* FG, and the more practical relevance of the latter, has been argued by Kose, Prassad, Rogoff, Wei (2009), where they point to the data on foreign asset positions compiled by Lane and Milessi Ferreti (2006 and 2007; henceforth, LMF) as a proper indicator of *de facto* FG.[21] [22]

It could be noted, however, that the stock size of cross border holdings, while a good indication of geographical diversification, may not be the best summary statistic of *de facto* FG in the traditional sense of capital mobility (as opposed to international risk sharing), since important gross flows in and out of a country are consistent with a relatively small net –and, to the extent that they reflect cumulative flows, with a limited geographical diversification of assets and liabilities.

While, as a subset of cross-border holdings, they are generally a poorer proxy for FG, the equity fund asset ratio (the ratio of assets under management by global and EM-dedicated equity funds, over market cap) may shed some additional light on the behaviour of betas over time. To the extent that equity funds tend to reflect global risk aversion (contributions and redemptions) by broad allocations not far from their benchmarks, they may introduce an additional source of comovement. Additional advantages include the fact that they are available weekly (although the weekly series covers a smaller subset of the universe than the monthly series) and, unlike BoP flows, they are adjusted for valuation changes. **Table 7** reports the medians of alternative FG measures used in the paper, for the early and late periods.

This distinction between the stock and flow approaches would be academic if flows and stocks were highly correlated across countries. Are they? To answer one could compare portfolio flow data from the balance of payments (BoP) and international financial positions obtained from alternative ways of accumulating BoP flows, including the already mentioned dataset by

[21] Kraay, Loayza and Ventura (2005) report a similar dataset on country´s asset positions. An alternative approach to FG relies on price convergence, an application of the Law of one Price to financial markets. Measures within this group point at transaction costs and regulation that inhibit market arbitrage, and usually compare prices of identical or similar assets trading in different markets. On this, see Levy Yeyati, Schmukler and Van Horen (2008) and references therein.

[22] LMF and the Chinn-Ito index are the de facto and de jure measures of choice in recent work on determinants and implications of FG (see, i.a., Kose, Prasad, Taylor, 2009 and Rodrik, and A. Subramanian, 2009).

LMF. The drawback of these BoP flows is that they are reported on a net basis: a furry of activity in the market as non residents trade intensely the country´s assets with each other may be associated with sharp price variations but close to zero net flows. Conversely, large cross border flows are consistent with minimal cross border trading activity.

The only systematic source of gross flows currently available is the TIC survey dataset compiled by the US Treasury, which covers both sales and purchases of financial assets by investors domiciled in the US, broken down by the market where the asset is issued.[23] The shortcoming with these data, naturally, lies in the fact that only US investors are surveyed.

A quick comparison reveals that country *i´*s equity holdings by US investors (TIC) and country *i´*s equity liabilities from valuation-adjusted cumulative BoP flows (LMF) are closely correlated both across countries (Table 8) and over time (the median time correlation between the two series is 99%). Moreover, a casual inspection shows that, except for Canada and Israel, the TIC/LMF ratio is close to 2/5 for all countries in our sample (**Figure 9**).[24]

On the negative side, flows and holdings tend to correlate less tightly. For our late period (2005-2009), I compare the average monthly gross sales and purchases by US investors of equity from individual countries, as well as the average (absolute value of) net sales, with the corresponding stock holdings by US investors at the beginning of the period (end-2004), all normalized by the country´s market capitalization at the beginning of the period to enhance comparability. As **Figure 10** shows, the fairly close correlation between gross flows and initial holdings is largely lost when we look at net purchases.

In the same vein, we could ask: Do flow volatility increases with foreign participation (suggesting the geographical diversification of the investor base as a potential source of volatility)? Replacing the averages by their standard deviations in the previous chart, **Figure 11**

[23] Specifically, from the perspective of an emerging country *i*, we look at the gross sales and purchases of country *i´*s equity and debt securities.

[24] Equity liability flows (BoP) would correspond broadly to the sum of gross purchases minus gross sales of foreign stocks by international investors (in this case, US residents) and valuation changes to initial holdings. Unfortunately, given recent price action, BoP flows largely reflect the latter at the expense of the former.

shows that initial holdings appear broadly in line with the volatility of gross flows, but not with that of net flows.

Bottom line: holdings of equity (and, for that matter, other globally traded assets) are not sufficient to characterize cross-border flows and de facto FG. For that reason, to study their incidence on EM asset betas, in what follows I use both.

c. Financial recoupling and FG

Does foreign participation increase the market betas to global returns? Does FG amplify the response of cross-border flows and asset prices in times of global turmoil?

A quick look at the correlation between equity returns, on the one hand, and US equity holdings and gross flows, on the other, contradicts this hypothesis (**Figure 12**). Both US holdings and US gross flows (the simple average of sales and purchases during the period) correlate positively (albeit weakly) with prices, and negatively with equity betas during the post-Lehman sell off, suggesting that foreign participation, if anything, mitigated the severity of the correction.[25] The same inference can be made from the correlation of equity betas with US holdings for the late period and, more generally (and predictably, given the tight correlation mentioned above), replacing US holdings with LMF´s estimates of the foreign equity liability position.

Looking at this more rigorously from an econometric perspective confirm this finding. Although in principle there appears to be a significant link between holdings and betas (Didier et al, 2010) a closer look reveals that it is entirely accounted for by the group of non-EM developing frontier markets.[26]

Table 9a illustrates the point. The first column reproduces the main result in Didier et al. (2010), which tries to explain the financial channel behind the large post-Lehman betas. As the next two columns show, the result disappears once we exclude frontier markets: US equity holdings do not change significantly the impact of S&P returns on equity returns (measured, as in their paper, as the change in the local stock market index) in other developed or emerging economies. The same is true when, in the second half of the table, I drop the Lehman interaction

[25] Net flows from US investors display no correlation with price movements during the crisis.
[26] Tatiana Didier kindly provided the data for this table.

and replace time dummies by S&P returns (a specification closer to our focus on market betas, here assumed a linear function of US holdings) or when we use MSCI country indexes instead local stock market indexes. Similarly, no association is found for other periods and FG proxies (**Table 9b**).

Figures 13 and **14** present a graphical illustration of the same point. The first one, by plotting country-by-country equity betas against US holdings, shows how, unlike in the case of frontier markets, the expected positive link between betas and FG fails to materialize. The second chart examines whether the change in FG over the 2000s (computed based on both US holdings and gross flows): although the slope is positive for gross US flows, the connection is not significant.[27]

7. Final remarks

The paper documented an intriguing result: on the one hand, business cycles in emerging markets have gradually decoupled from those in advanced economies, as trade diversification, commodity strength and, particularly, the emergence of China took over the G7 as the main global factor behind output fluctuations in the emerging world. On the other, cross-market comovements (market betas, even at lower frequencies) have remained high or even grown higher in the past few years, even before the synchronized sell off of 2008 took place. To the extent that, as the crisis clearly illustrated, asset prices movements continue to influence economic activity, financial interdependence remains a source of global exposure that the diversification, and the steady improvement in EM fundamentals could not eliminate.

Are these contrasting findings due to the globalization of emerging markets, namely, the increasing share in the hands of global investors prone to cross market arbitrage and proxy hedging? Our preliminary tests, using alternative stock and flow measures of FG, provide a negative answer to this question, which remains a minor puzzle in the emerging market literature in need for a closer examination.

[27] Similarly, changes in LMF equity liability ratios are positively but not significantly correlated with changes in betas.

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Table 1

Country	FTSE	MSCI	GDP per capita 2009 (USD, current prices)	5-year avg. GDP growth forecast % (IMF)	This paper
China	SEM	EM	3,566	9.6	AEM
India	SEM	EM	1,033	7.5	EM
Indonesia	SEM	EM	2,224	5.5	EM
Korea	-	EM	16,450	4.6	AEM
Malaysia	SEM	EM	7,469	4.8	EM
Philippines	SEM	EM	1,721	4.1	EM
Singapore	-	Dev.	34,346	4.3	AEM
Taiwan	AEM	EM	15,373	4.5	AEM
Thailand	SEM	EM	3,973	5	EM
Vietnam	F	F	1,052	6.4	EM
Argentina	F	F	7,508	2.6	EM
Brazil	AEM	EM	7,737	3.6	AEM
Chile	SEM	EM	8,853	4.9	AEM
Colombia	SEM	EM	4,662	4.2	EM
Ecuador	-	-	3,939	2.4	EM
Mexico	AEM	EM	8,040	4.8	EM
Peru	SEM	EM	4,377	5.5	EM
Uruguay	-	-	9,449	3.7	EM
Venezuela	-	-	12,354	0.3	EM
Bulgaria	F	F	5,916	2.7	EM
Czech Republic	SEM	EM	18,194	3.1	AEM
Estonia	F	F	13,509	1.9	EM
Hungary	AEM	EM	12,386	2.9	EM
Latvia	-	-	10,701	1.9	EM
Lithuania	F	F	10,775	2.1	EM
Poland	AEM	EM	11,098	3.6	AEM
Romania	F	F	7,503	4.7	EM
Russia	SEM	EM	8,874	3.5	EM
Turkey	SEM	EM	8,427	3.6	EM
Ukraine	-	F	2,538	4.6	EM
Egypt	SEM	EM	2,450	5.4	EM
Israel	-	EM	29,672	4	AEM
South Africa	AEM	EM	5,635	3.8	AEM

Sources: FTSE, MSCI, IFS

Table 2: Real decoupling – Growth as a function of G7 and Chinese growth in EM and PCE (y/y, quarterly data)

Variable	EM Panel Estimation			CRB	WTI	EM Median Sample[a]			Panel	
□	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
G7	0.432***	1.636***	0.988***	0.96	7.728***	0.311*	1.672***	0.963*	0.327*	0.1690
	(0.0000)	(0.0000)	(0.0000)	(0.2530)	(0.0000)	(0.0550)	(0.0070)	(0.1000)	(0.0810)	(0.4350)
G7_late	0.146**	-1.299***	-0.763***			0.222*	-1.476**	-0.823	0.492**	0.487**
	(0.0430)	(0.0000)	(0.0000)			(0.0650)	(0.0230)	(0.1950)	(0.0330)	(0.0390)
China		0.850***	0.557***	2.826***	0.184		0.748***	0.329**	0.121*	0.0500
		(0.0000)	(0.0000)	(0.0000)	(0.9110)		(0.0000)	(0.0405)	(0.0670)	(0.5110)
China_late		0.420***	0.174***				0.362*	0.217	-0.153***	-0.223***
		(0.0000)	(0.0060)				(0.0730)	(0.1420)	(0.0050)	(0.0020)
crb			0.091***					0.080***	0.0000	0.028*
			(0.0000)					(0.0060)	(0.0000)	(0.0690)
wti			0.013***					0.012	0	0.002
			(0.0050)					(0.1290)	(0.0000)	(0.6110)
α	0.028***	-0.086***	-0.040***	-0.269***	-0.124	0.028***	-0.067**	-0.014		
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.4610)	(0.0000)	(0.0210)	(0.2710)		
Observations	1357	1357	1357	63	63	67	64	63	264	264
R-squared	0.123	0.258	0.301	0.267	0.289	0.183	0.434	0.56	0.419	0.426
G7+G7_late	0.578***	0.347***	0.226***			0.533**	0.195**	0.140**	0.818***	0.657***
	(0.0000)	(0.0000)	(0.0000)			(0.0130)	(0.0280)	(0.0270)	(0.0000)	(0.0000)
China+China_late		1.270***	0.731***				1.110***	0.546**	-0.054	-0.172
		(0.0000)	(0.0000)				(0.0010)	(0.0250)	(0.5790)	(0.1230)

Note: a Median values from country-by-country regressions. G7 growth computed as the average of individual growth rates weighed by the dollar GDP of the previous year. The EM sample includes Argentina, Brazil, Chile, Colombia, Czech Republic, Hong Kong, Hungary, India, Indonesia, Israel, South Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, Singapore, South Africa, Taiwan, Thailand, Turkey and Venezuela. The Core Peripheral (CP) sample includes Australia, New Zealand, Norway and Sweden. Source: IMF. For panel regressions, ***,** and * denotes significante at a 1, 5 and 10% respectively. *p-values* in parentheses.

Table 3: The real-financial link – EM growth as a function of currency, equity and credit spreads (y/y, quarterly data)

	1993-2009	1993-2009	1993-2001	1993-2001	1993-2001	2001-2009	2001-2009	2001-2009	2001-2009
Dependent Variable	**gdp_growth**	**gdp_growth**	**gdpgrowth**	**residual**	**residual**	**gdpgrowth**	**residual**	**residual**	**residual**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
msci_1	0.038***	0.050***		0.036***	0.039***		0.015***	0.016**	0.025***
	(0.0000)	(0.0000)		(0.0000)	(0.0000)		(0.0050)	(0.0220)	(0.0020)
msci_1_late	-0.007	-0.024***							
	(0.3060)	(0.0050)							
fx_1	-0.012**	0.018***		-0.006	0.016***		-0.028	-0.049**	-0.046**
	(0.0500)	(0.0030)		(0.3110)	(0.0090)		(0.1100)	(0.0130)	(0.0180)
fx_1_late	-0.01	-0.059***							
	(0.5950)	(0.0050)							
spread_1		-0.005**			-0.023***			0.005**	
		(0.0480)			(0.0000)			(0.0480)	
spread_1_late		0.002							
		(0.2990)							
HY_1									0.015***
									0.001
α	-0.038***	0.005	-0.103***	-0.003**	0.135***	-0.059***	-0.001	-0.031**	-0.099***
	(0.0000)	(0.8150)	(0.0000)	(0.0680)	(0.0000)	(0.0000)	(0.3690)	(0.0490)	(0.0010)
Observations	1277	682	597	551	234	759	726	448	448
R-squared	0.381	0.438	0.320	0.140	0.386	0.369	0.055	0.091	0.104
fx_1+fx_1_late	-0.022	-0.041**							
	(0.2120)	(0.0410)							
Msci_1+msci_1_late	0.031***	0.027***							
	(0.0000)	(0.0000)							

Table 3: The real-financial link – EM growth as a function of currency, equity and credit spreads (y/y, quarterly data)

	1993-2009	1993-2009	1993-2001	1993-2001	1993-2001	2001-2009	2001-2009	2001-2009	2001-2009
Dependent Variable	**gdp_growth**	**gdp_growth**	**gdpgrowth**	**residual**	**residual**	**gdpgrowth**	**residual**	**residual**	**residual**
Spread_1+spread_1_late		-0.004							
		(0.1410)							
Other controls									
G7	0.824***	0.932***	2.029***			0.348***			
	(0.0000)	(0.0000)	(0.0000)			(0.0000)			
G7_late	-0.644***	-0.791***							
	(0.0000)	(0.0020)							
China	0.552***	0.259***	0.904***			0.963***			
	(0.0000)	(0.0100)	(0.0000)			(0.0000)			
China_late	0.195***	0.274***							
	(0.0010)	(0.0080)							
ToT	0.141***	0.127***	0.167***			0.153***			
	(0.0000)	(0.0000)	(0.0000)			(0.0000)			

Note: a Median values from country-by-country regressions. G7 growth computed as the average of individual growth rates weighed by the dollar GDP of the previous year. The EM sample includes Argentina, Brazil, Chile, Colombia, Czech Republic, Hong Kong, Hungary, India, Indonesia, Israel, South Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, Singapore, South Africa, Taiwan, Thailand, Turkey and Venezuela. Source: IMF. For panel regressions, ***,** and * denotes significance at a 1, 5 and 10% respectively. In parenthesis appears the correspondent the *p-value*.

Table 4.a: Equity betas

		Coefficients			
		2000-2004	2005-2009	2005-2007	2008-2009
EM	Annual	1.25248	1.70712	-	-
	Quarterly	1.18538	1.56863	1.56069	1.53809
	Monthly	0.97977	1.46831	1.52666	1.43157
AEM	Annual	1.24746	1.62224	-	-
	Quarterly	1.17602	1.50805	1.53704	1.47557
	Monthly	1.00022	1.42636	1.42735	1.40255
PCE	Annual	1.26685	1.63724	-	-
	Quarterly	1.13715	1.52584	1.23322	1.53067
	Monthly	0.96188	1.35948	1.35157	1.36641

This table reports, for 3 groups of countries, the median betas from regressions: MSCI vs. S&P. It´s based on monthly, quarterly and annual data.

Table 4.b: Credit betas

		Coefficients			
		2000-2004	2005-2009	2005-2007	2008-2009
EM	Annual	0.77342	1.01141	-	-
	Quarterly	0.90554	0.91257	0.73647	0.99023
	Monthly	0.81607	0.93019	0.76108	1.01358
AEM	Annual	0.71588	0.96317	-	-
	Quarterly	0.91683	0.91257	0.72965	0.99023
	Monthly	0.91732	0.86426	0.66608	0.94901

This table reports, for 3 groups of countries, the median betas from regressions: EMBI vs. HY. It´s based on monthly, quarterly and annual data.

Table 4.c: Currency betas

		Coefficients			
		2000-2004	2005-2009	2005-2007	2008-2009
EM	Annual	0.32699305	0.85284183	-	-
	Quarterly	0.22035691	0.7923811	0.26697806	1.1252897
	Monthly	0.24713076	0.66147736	0.29500519	0.7673711
AEM	Annual	0.52961966	0.95857634	-	-
	Quarterly	0.34778696	1.04225101	0.39065549	1.39006585
	Monthly	0.30229572	0.69722255	0.44619098	0.95414609
PCE	Annual	1.2705998	1.57497365	-	-
	Quarterly	1.07572975	1.3784636	0.61918192	1.6285571
	Monthly	0.95492978	1.2058345	0.83288459	1.29401745

This table reports, for 3 groups of countries, the median betas from regressions: FX vs. DXY. It´s based on monthly, quarterly and annual data.

Table 5.a: Equities against changes in S&P (2005-2009)

	Coefficients				% significant β - DIF
	α	β - POS	β - NEG	β - DIF	
Median - EM	0.01958	1.28070**	1.54260**	-0.21640	5.26%
Subgroup I - AEM	0.01728	1.28070**	1.49710**	-0.21640	0.00%
Subgroup II - LAC	0.02433	1.12825**	1.54947**	-0.36657	12.50%
Median – PCE	0.00685	1.27607**	1.40000**	-0.14438	0.0%

* Significant at the 10%. ** Significant at the 5%.

Table 5.b: Spreads against changes in HY (2005-2009)

	Coefficients				% significant β - DIF
	α	β - POS	β - NEG	β - DIF	
Median – EM	-0.0174	0.9541**	0.8963**	0.1579	0.00%
Median – AEMs	-0.0093	0.9410**	0.9069**	0.13	0.00%
Median – LAC	-0.0231	0.9394**	0.5858**	0.3229	0.0%

* Significant at the 10%. ** Significant at the 5%.

Table 5.c: FX against Changes in DXY (2005-2009)

	Coefficients				% significant β - DIF
	α	β - POS	β - NEG	β - DIF	
Median – EM	0.0061	0.4217*	0.7681**	-0.4897	36.80%
Subgroup I - AEM	0.0038	0.5823**	0.8537**	-0.1788	30.00%
Subgroup II - LAC	0.0062	0.1359	0.6191	-0.4897	28.60%
Median – PCE	0.0021	0.9067**	1.4342**	-0.3946	25.0%

* Significant at the 10%. ** Significant at the 5%.

Table 6. Expected growth and equity returns

Equity returns					
Expected growth	3.504**	3.026**	0.651	1.789	
Expected growth (t+1)			5.124***	2.881	
Expected growth (t+1, consensus)					4.366*
S&P returns		1.461***		1.395***	1.202***
R-squared	0.74	0.68	0.75	0.67	0.93
Test: Exp. growth (current + lead)			5.775***	4.670**	
Year dummies	Yes		Yes		

Note: *, **, *** Denote significance at the 1%, 5%, and 10% levels, respectively. Source: IMF´s WEO

Table 7: Alternative Financial Globalization Proxies

Country	US equity holdings		LMF equity liabilities		Avg US sales and purchases		Fund AUM		Fund flows		De jure FG	
	Early*	Late**	Early*	Late**	Early*	Late**	Early*	Late**	Early*	Late**	Early*	Late**
Median - EM	7.51%	7.18%	24.55%	31.30%	5.94%	6.37%	4.57%	6.36%	0.012%	0.025%	-0.1802	0.0029
Subgroup I - AEM	8.28%	9.32%	26.32%	30.70%	9.00%	7.19%	5.84%	7.53%	0.018%	0.023%	-0.1802	1.0841
Subgroup II - LAC	5.52%	2.81%	24.55%	30.64%	4.71%	8.46%	2.74%	2.92%	0.000%	0.018%	0.3371	0.4985

Fund AUM: assets under management by global equity funds. De jure FG: Chinn and Ito Index of Financial Openness (Chinn and Ito, 2008).
* Average ratios per country, period 2000-2004. All the variables are expressed in terms of market capitalization.
** Average ratios per country, period 2005-2009. All the variables are expressed in terms of market capitalization. LMF equity liabilities and de jure openness: average 2005-2007 and US equity holdings: average: 2005-2008.

Table 8

HOLDINGS – COMPARISON ACROSS SOURCES

Year	CORREL (TIC, LMF)	TIC / LMF		(LMF - TIC) / GDP	
		Average	Median	Average	Median
2001	92.3%	39.1%	40.5%	5.7%	4.2%
2002					
2003	90.3%	40.2%	40.7%	7.1%	4.6%
2004	89.4%	37.1%	39.1%	8.5%	6.7%
2005	86.8%	38.1%	40.0%	9.9%	7.3%
2006	88.4%	39.1%	38.6%	13.3%	9.3%
2007	86.0%	37.0%	34.5%	14.6%	13.4%
2008					

Table 9.a: US holdings and equity response to the S&P 500

Variable	Time dummies, Lehman interaction			Replacing time dummies by SPX					
	1	2	3	4	5	6	7	8	9
	Full sample (Didier et al., 2010)	EM +Developed	Non-EM developing	Full sample	No Lehman interaction	EM +Developed	Non-EM developing	EM	EM (MSCI Index)
SPX*US Holdings *Pre Lehman	0.2783***	-0.002	0.4869***	0.0141*					
	(0.0000)	(0.9830)	(0.0010)	(0.0680)					
SPX*US Holdings *Post Lehman	0.2149***	0.072	0.3234**	0.0113					
	(0.0000)	(0.3970)	(0.0180)	(0.1060)					
SPX*US Holdings					.0118*	-0.004	.0382**	0.0016	-0.004
					(0.0910)	(0.6170)	(0.0270)	(0.8680)	(0.7020)
SPX				0.8549***	0.8549***	1.080***	0.7516***	1.071***	1.506***
				(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R-squared	0.5575	0.6817	0.4669	0.3469	0.3469	0.5538	0.2742	0.4882	0.5542
Observations	1539	651	802	1628	1628	682	858	391	391
Time dummies	Yes	Yes	Yes	No	No	No	No	No	No
Countries	74	31	39	74	74	31	39	17	17

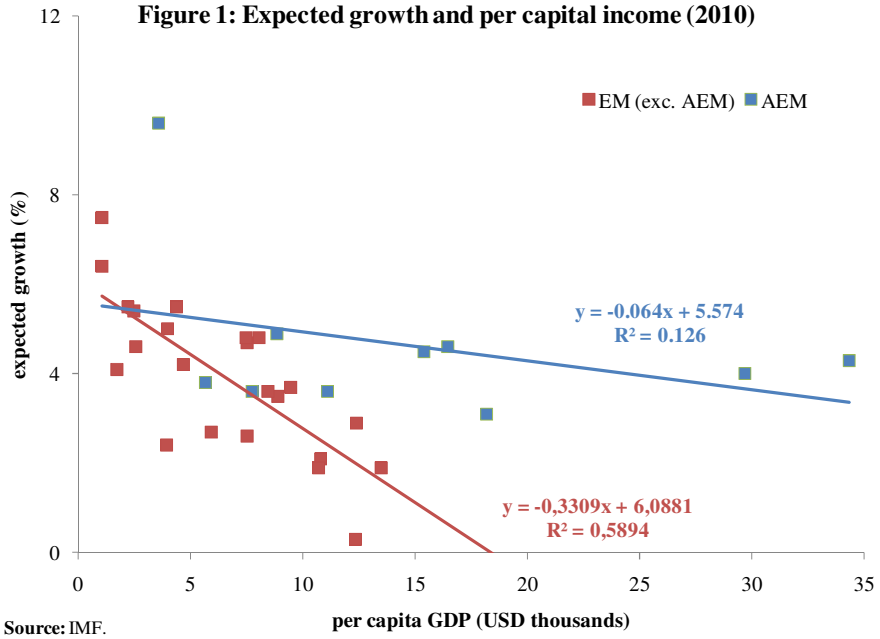
Note: *, **, *** Denote significance at the 1%, 5%, and 10% levels, respectively. In parenthesis appears the correspondent the p-value.
First three columns present data from Didier et al., and their methodology. Returns are normal local returns, are filtered leaving outliers out, and US Holdings are normalized by subtracting its sample average and dividing it by its sample standard deviation. Additionally their crisis period are defined as 6/2007 to 4/2009 as opposed to the 2008-2009 crisis period used in this paper. In turn, columns 4-9 are presented for the same data but with our methodology. Returns are dlog(stock_index) and does not filter any local stock market returns. In these columns US Holdings are not normalized.

Table 9.b: FG proxies and equity response to the S&P 500

	Crisis					Late					2001-2009
FG proxy	**US equity holdings**	**LMF equity liabilities**	**Fund flows**	**Fund AUM**	**Avg US sales and purchases**	**US equity holdings**	**LMF equity liabilities**	**Fund flows**	**Fund AUM**	**Avg US sales and purchases**	**LMF equity liabilities**
	EM	**EM**	**EM**	**EM**	**EM**	**EM**	**EM**	**EM**	**EM**	**EM**	**EM**
S&P Returns*FG	-0.0038	0.0038	2.5641***	.0318*	-0.0083	-0.0044	0.0028	2.8241***	.0257*	-0.0069	0.0003
	(0.5910)	(0.3520)	(0.0000)	(0.0970)	(0.4610)	(0.3980)	(0.3970)	(0.0000)	(0.0950)	(0.4870)	(0.9370)
S&P Returns	1.489***	1.274***	1.115***	1.210***	1.464***	1.544***	1.325***	1.120***	1.329***	1.499***	1.251***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R-squared	0.5839	0.5849	0.6199	0.5873	0.5839	0.4944	0.4946	0.5283	0.4958	0.4940	0.3599
Observations	408	408	323	408	408	1020	1020	935	1020	1020	2023
Time dummies	No	No	No	No	No	No	No	No	No	No	No
Countries	17	17	17	17	17	17	17	17	17	17	17

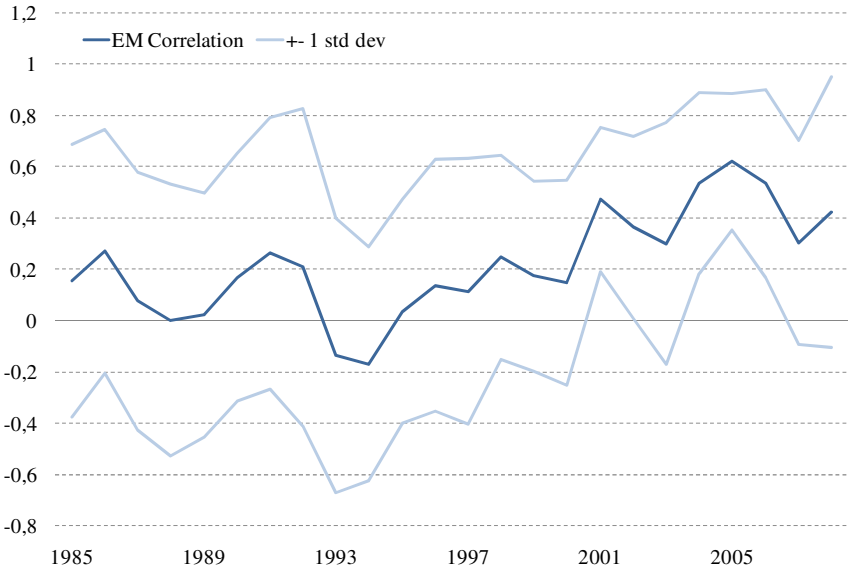
Note: *, **, *** Denote significance at the 1%, 5%, and 10% levels, respectively. In parenthesis appears the correspondent the p-value.
Fund AUM: assets under management by global equity funds. Fund flows: valuation-adjusted absolute flows from global equity funds into the country. Data is taken from this paper's database. Returns are measured as dlog(stock_index), and data is from 01/2000 to 12/2009. FG proxies are the financial globalization measures over market capitalization of the previous year.

Figure 1: Expected growth and per capital income (2010)



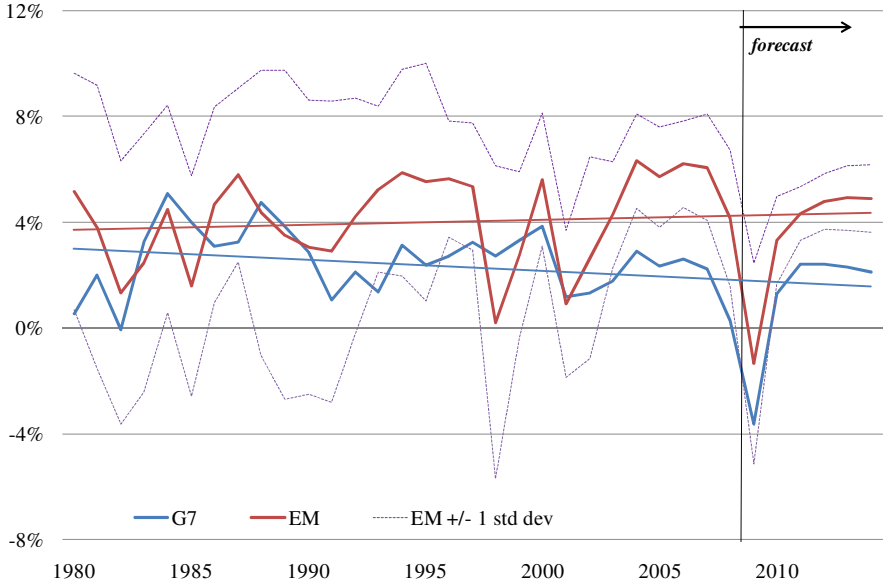
Source: IMF.

Figure 2: Average 5-year correlation between EM and G7 output



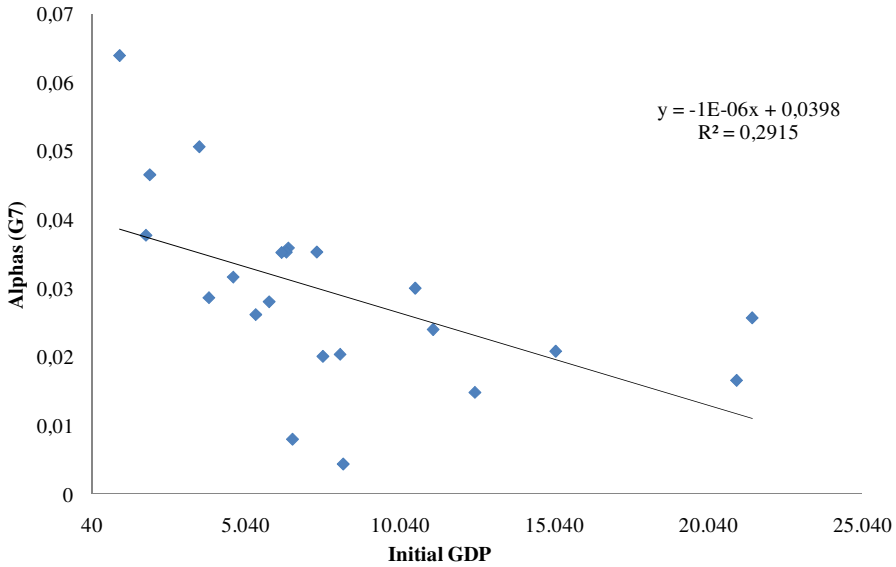
Note: Average correlations of y/y EM growth rates and G7 growth over the past five years. **Source:** IMF.

Figure 3: Growth divergence: EM vs. G7



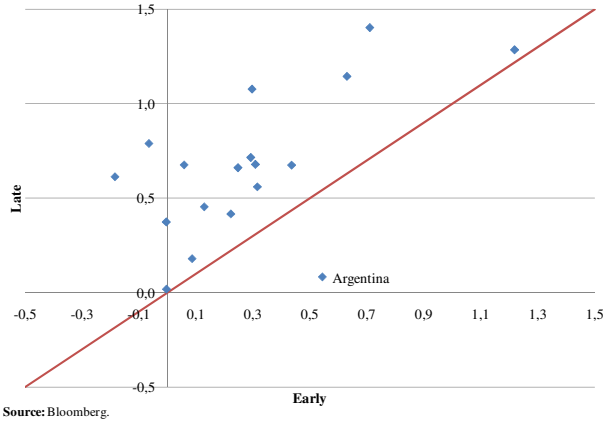
Note: Note: Note: EM and G7 average forecasts are from the IMF's WEO. **Source**: IMF.

Figure 4: EM-G7 growth differentials and initial GDP



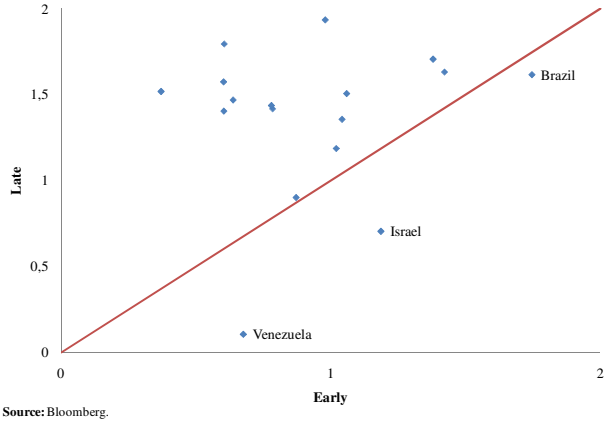
Note:Alphas are from country-by-country regressions reported in Table 2. Initial GDP is real per capita GDP in 1992.
Source: IMF.

Figure 5.a: Currency betas to the DXY



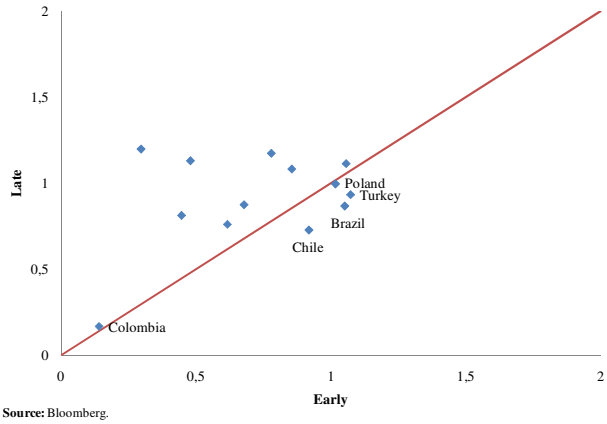
Source: Bloomberg.

Figure 5.b Equity betas to the S&P 500



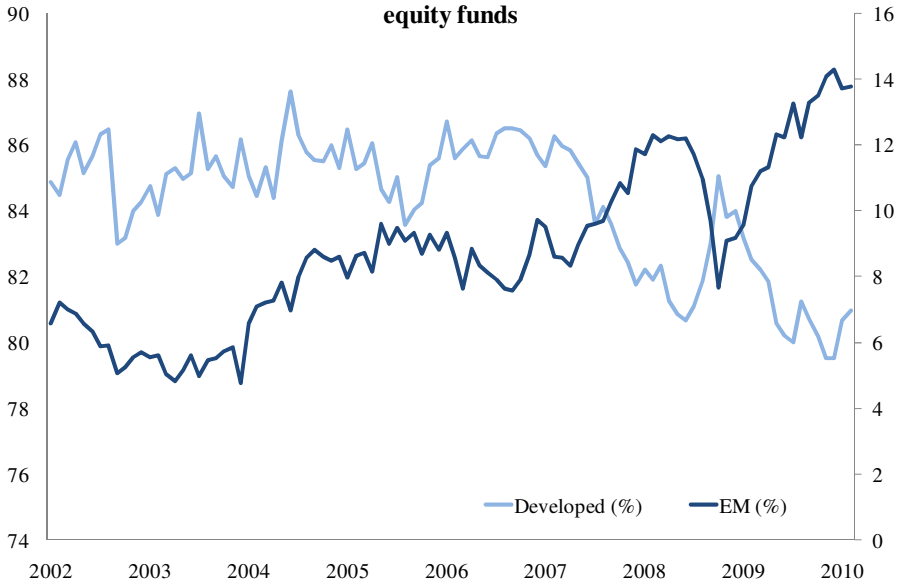
Source: Bloomberg.

Figure 5.c: Credit betas to HY corporate spreads



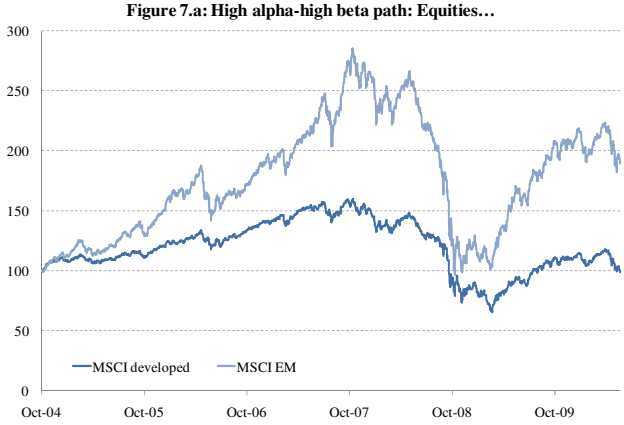
Source: Bloomberg.

Figure 6: EM equities in the global portfolio: Composition of equity funds



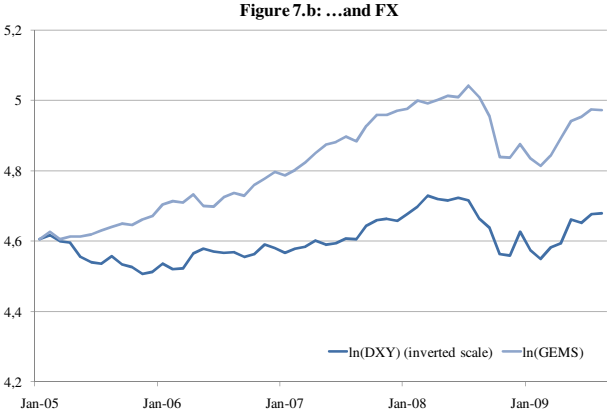
Source: EPFR.

Figure 7.a: High alpha-high beta path: Equities…



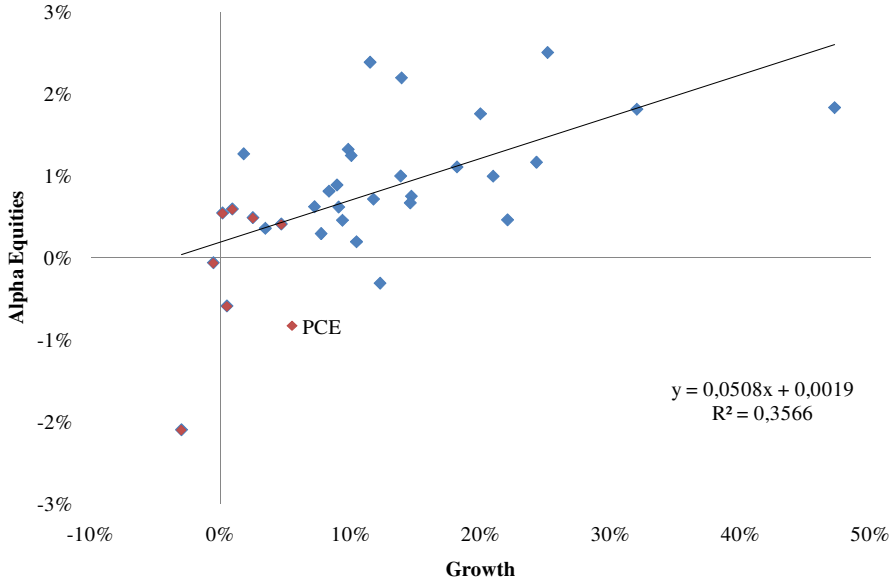
Source: Bloomberg.

Figure 7.b: …and FX



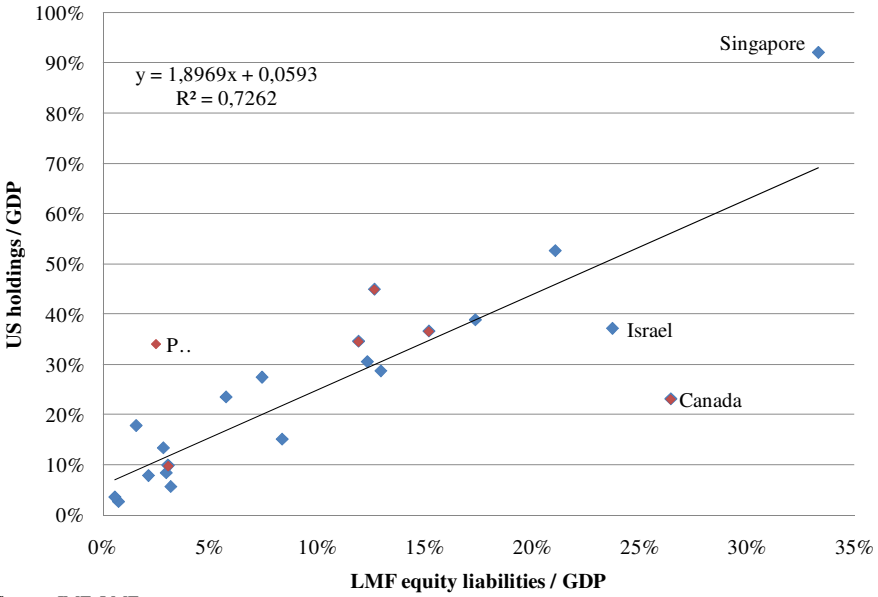
Source: Bloomberg.

Figure 8: Growth and equity alphas (2005-2009)



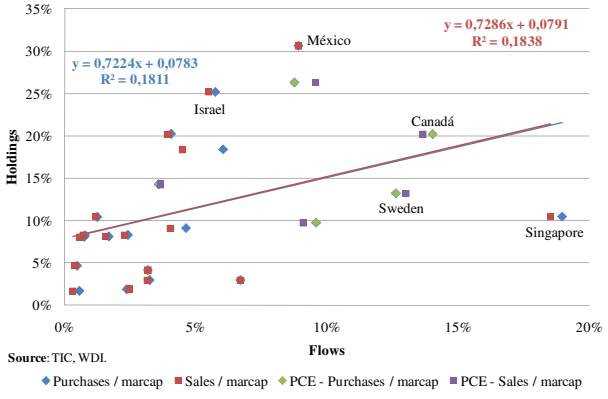
Source: IMF.

Figure 9: Cross-border equity holdings (2007)



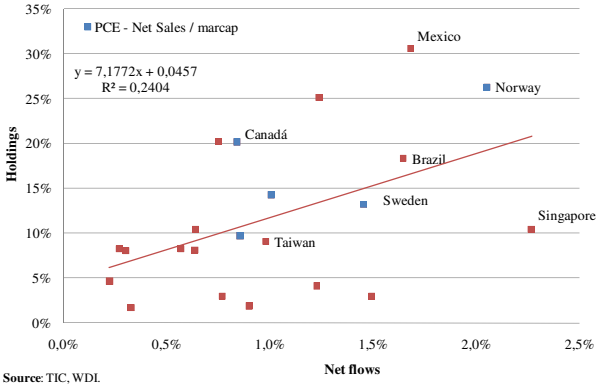
Source: IMF; LMF.

Figure 10.a: US holdings (2004) vs. US equity flows (2005-2009)



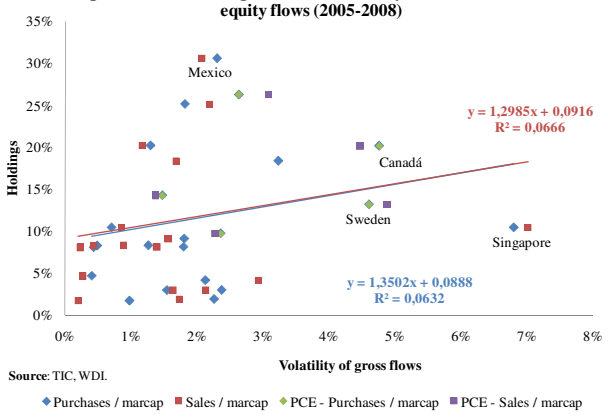
Source: TIC, WDI.

Figure 10.b: US holdings (2004) vs. US net equity flows (2005-2009)



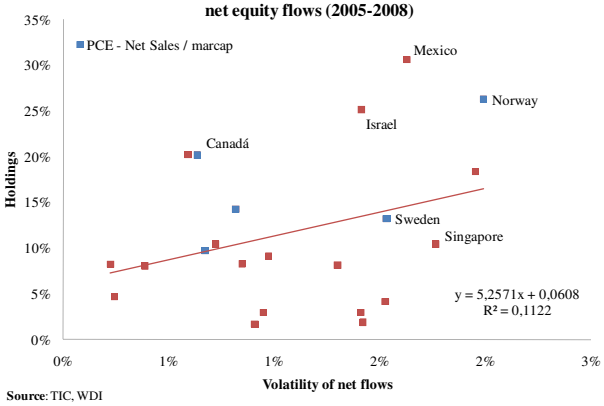
Source: TIC, WDI.

Figure 11.a: US holdings (2004) vs. Volatility of US cross-border equity flows (2005-2008)



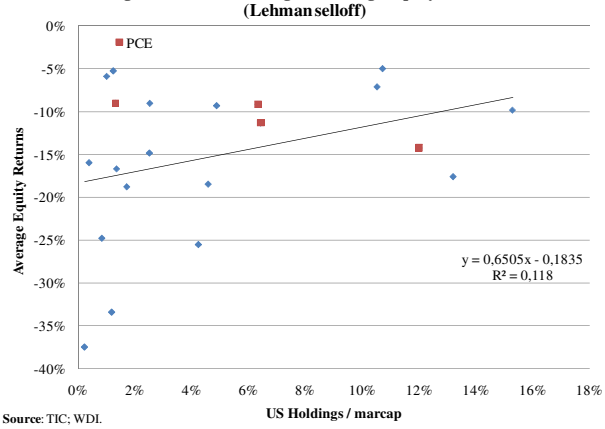
Source: TIC, WDI.

Figure 11.b: US holdings (2004) vs. Volatility of US cross-border net equity flows (2005-2008)



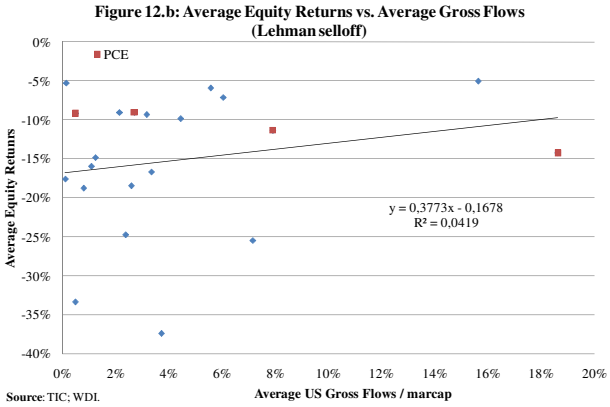
Source: TIC, WDI

Figure 12.a: US Holdings vs Average Equity Returns (Lehman selloff)



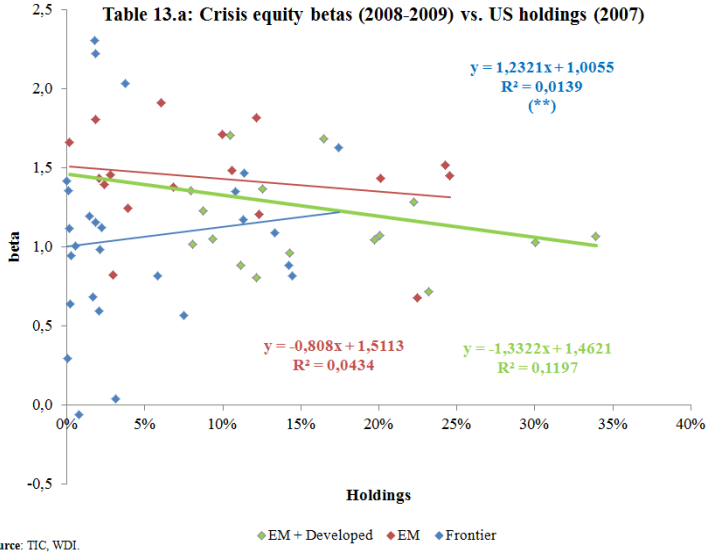
Source: TIC; WDI.

Figure 12.b: Average Equity Returns vs. Average Gross Flows (Lehman selloff)



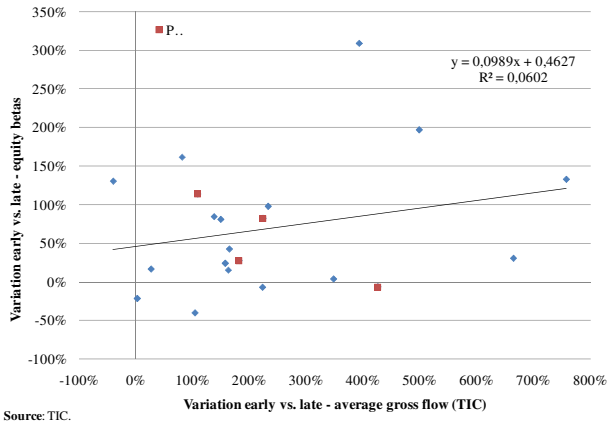
Source: TIC; WDI.

Table 13.a: Crisis equity betas (2008-2009) vs. US holdings (2007)



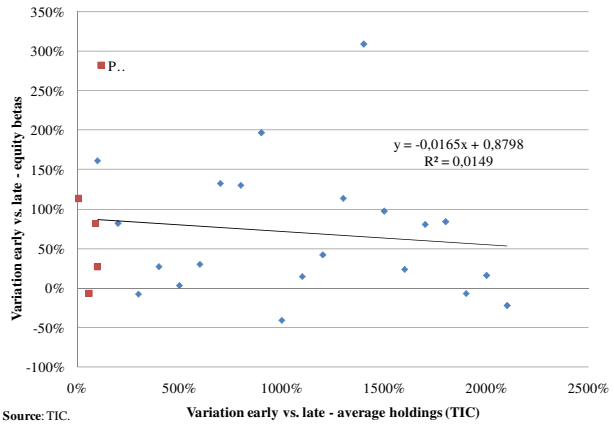
Source: TIC, WDI.

Table 14.a: Betas Variation vs. Gross Flow (TIC) Variation



Source: TIC.

Table 14.b: Betas Variation vs. US Holdings Variation



Source: TIC.

Appendix - Table A1

Equities indexes against S&P - Monthly Changes

		2000-2004		2005-2009		2005-2007		2008-2009	
		α	β	α	β	α	β	α	β
1	**Brazil**	0.0079	1.7458	0.0229	1.6153	0.0250	2.1174	0.0146	1.5113
2	**China**	-0.0015	1.0421	0.0176	1.3558	0.0243	1.7750	0.0030	1.2426
3	**Taiwan**	-0.0071	1.0207	0.0038	1.1861	0.0001	1.2090	0.0093	1.2017
4	**Poland**	0.0077	0.9798	0.0058	1.9342	0.0088	1.9773	0.0007	1.9101
5	**Czech Republic**	0.0216	0.6386	0.0123	1.4683	0.0229	1.1058	-0.0005	1.4785
6	**Singapore**	-0.0008	0.7848	0.0102	1.4167	0.0115	1.3195	0.0093	1.4280
7	**Chile**	0.0066	0.8720	0.0133	0.9010	0.0085	1.4958	0.0148	0.8168
8	**Korea**	0.0068	1.4216	0.0108	1.6307	0.0150	1.3589	0.0069	1.6582
9	**Israel**	0.0038	1.1860	0.0093	0.7043	0.0078	0.9188	0.0096	0.6729
10	**South Africa**	0.0098	0.7804	0.0091	1.4360	0.0041	1.9018	0.0123	1.3771
11	**Australia**	0.0098	0.7473	0.0080	1.3595	0.0093	1.2830	0.0066	1.3664
12	**Canada**	0.0067	1.0286	0.0089	1.3081	0.0098	1.4451	0.0062	1.2780
13	**New Zealand**	0.0113	0.5632	-0.0045	1.2020	-0.0027	1.0238	-0.0055	1.2253
14	**Norway**	0.0122	0.9619	0.0077	1.6614	0.0145	1.3516	0.0004	1.6826
15	**Sweden**	0.0003	1.4937	0.0045	1.3934	0.0031	1.5267	0.0053	1.3763
Median - EM		0.0068	0.9798	0.0109	1.4683	0.0119	1.5267	0.0069	1.4316
	Subgroup I - AEM	0.0067	1.0002	0.0105	1.4264	0.0102	1.4274	0.0093	1.4026
	Subgroup II - LAC	0.0081	0.6409	0.0152	1.5116	0.0154	1.7939	0.0124	1.4402
Median - PCE		0.0098	0.9619	0.0077	1.3595	0.0093	1.3516	0.0053	1.3664

This table reports, for 3 AEMs and PCE, betas from regressions: MSCI vs. S&P. It´s based on monthly, quarterly and annual data.

Appendix - Table A2

Spreads against HY - Monthly Changes

		2000-2004		2005-2009		2005-2007		2008-2009	
		α	β	α	β	α	β	α	β
1	**Brazil**	-0.0035	1.0502	-0.0202	0.8643	-0.0261	0.7611	-0.0092	0.9490
2	**China**	-0.0091	0.4449	-0.0062	0.8093	0.0108	0.6661	-0.0290	0.9046
3	**Poland**	-0.0119	1.0158	-0.0002	0.9926	-0.0106	0.6588	0.0218	1.2589
4	**Chile**	-0.0070	0.9173	-0.0007	0.7248	0.0151	0.5939	-0.0218	0.8118
5	**South Africa**	-0.0094	0.7781	-0.0055	1.1711	-0.0003	0.9152	-0.0082	1.3637
6	**Russia**	-0.0380	0.4779	-0.0122	1.1272	-0.0203	0.7997	0.0065	1.3868
7	**Mexico**	-0.0102	0.6769	-0.0072	0.8718	-0.0114	0.7513	0.0016	0.9685
8	**Turkey**	-0.0010	1.0718	-0.0143	0.9302	-0.0149	0.8227	-0.0112	1.0136
9	**Argentina**	0.0367	0.2948	-0.0442	1.1956	-0.0868	1.3571	0.0164	1.1087
10	**Colombia**	0.0040	0.1389	-0.0040	0.1642	-0.0062	0.1322	-0.0001	0.1907
11	**Peru**	-0.0052	0.8540	-0.0171	1.0792	-0.0219	0.9291	-0.0068	1.1991
12	**Venezuela**	-0.0090	0.6152	0.0082	0.7575	-0.0037	0.7403	0.0263	0.7813
13	**Uruguay**	0.0318	1.0554	-0.0194	1.1107	-0.0282	1.0272	-0.0045	1.1828
Median - EM		-0.0080	0.8161	-0.0072	0.9302	-0.0114	0.7611	-0.0045	1.0136
	Median - AEMs	-0.0091	0.9173	-0.0055	0.8643	-0.0003	0.6661	-0.0092	0.9490
	Median - LAC	-0.0052	0.8540	-0.0121	0.8680	-0.0167	0.7562	-0.0023	0.9587

This table reports, for 3 AEMs and PCE, betas from regressions: EMBI vs. HY. It´s based on monthly, quarterly and annual data.

Appendix - Table A3

Spot FX against DXY - Monthly Changes

		2000-2004		2005-2009		2005-2007		2008-2009	
		α	β	α	β	α	β	α	β
1	**Brazil**	-0.0083	0.3081	0.0060	0.6789	0.0112	-0.0662	-0.0023	1.0090
2	**China**	0.0009	-0.0038	0.0032	0.0169	0.0035	-0.0254	0.0028	0.0355
3	**Taiwan**	-0.0018	0.2223	-0.0009	0.4159	-0.0007	0.3207	-0.0011	0.4564
4	**Poland**	0.0019	0.7096	-0.0007	1.4042	0.0048	1.3166	-0.0093	1.4587
5	**Czech Republic**	0.0019	1.2173	0.0024	1.2862	0.0051	1.2980	-0.0019	1.2899
6	**Singapore**	-0.0009	0.3151	0.0020	0.5597	0.0032	0.4411	0.0000	0.6137
7	**Chile**	-0.0027	0.2921	0.0008	0.7156	0.0029	0.2950	-0.0026	0.8993
8	**Korea**	-0.0002	0.2965	-0.0036	1.0781	0.0025	0.4513	-0.0134	1.3616
9	**Israel**	-0.0022	0.2471	0.0013	0.6615	0.0029	0.4666	-0.0014	0.7488
10	**South Africa**	-0.0014	0.6293	-0.0062	1.1453	-0.0060	1.2557	-0.0065	1.0995
11	**Australia**	-0.0015	0.9255	0.0009	1.2724	0.0029	0.8870	-0.0024	1.4412
12	**New Zealand**	0.0012	0.9843	-0.0018	1.1393	0.0016	0.7788	-0.0073	1.3020
13	**Sweden**	-0.0012	1.1291	-0.0028	1.3278	0.0000	1.4490	-0.0073	1.2861
14	**Canada**	0.0007	0.4703	0.0011	0.7239	0.0052	0.4327	-0.0055	0.8598
15	**Russia**	0.0002	0.0583	-0.0019	0.6761	0.0031	0.4972	-0.0098	0.7674
16	**Mexico**	-0.0015	-0.1845	-0.0034	0.6132	0.0007	-0.1823	-0.0102	0.9613
17	**Turkey**	-0.0172	0.4353	-0.0031	0.6750	0.0039	0.2076	-0.0143	0.8943
18	**India**	-0.0005	0.1288	-0.0019	0.4539	0.0025	0.2282	-0.0089	0.5630
19	**Argentina**	-0.0213	0.5433	-0.0043	0.0825	-0.0016	-0.1014	-0.0087	0.1688
20	**Colombia**	-0.0027	-0.0650	0.0016	0.7893	0.0042	0.0413	-0.0029	1.1127
21	**Peru**	0.0011	-0.0043	0.0016	0.3734	0.0023	0.3021	0.0005	0.4056
22	**Venezuela**	-0.0147	-0.6526	-0.0020	0.0572	-0.0032	0.1836	0.0000	0.0000
23	**Uruguay**	-0.0143	0.0864	0.0043	0.1786	0.0058	-0.2370	0.0017	0.3585
Median - EM		-0.0015	0.2471	-0.0007	0.6615	0.0029	0.2950	-0.0026	0.7674
	Subgroup I - AEM	-0.0011	0.3023	0.0010	0.6972	0.0031	0.4462	-0.0021	0.9541
	Subgroup II - LAC	-0.0055	0.0411	0.0012	0.4933	0.0026	-0.0124	-0.0025	0.6524
Median - PCE		-0.0002	0.9549	-0.0004	1.2058	0.0023	0.8329	-0.0064	1.2940

This table reports, for 3 AEMs and PCE, betas from regressions: FX vs. DXY. It´s based on monthly, quarterly and annual data.

Appendix - Table A4

Equities against Changes in S&P (2005-2009)

	Coefficients				R^2
	α	β - POS	β - NEG	β - DIF	
Brazil	0.0234	1.5978**	1.6238**	-0.0260	50.11%
China	0.0217	1.1901**	1.4363**	-0.2462	45.46%
Taiwan	-0.0064	1.6044**	0.9830**	0.6214	50.78%
Poland	0.0207	1.3233**	2.2309**	-0.9076	63.52%
Czech Republic	0.0223	1.0599**	1.6667**	-0.6068	58.97%
Singapore	0.0138	1.2706**	1.4876**	-0.2170	70.77%
Chile	0.0243	0.4482**	1.1210**	-0.6727	42.65%
Korea	0.0060	1.8263**	1.5357**	0.2906	62.67%
Israel	0.0061	0.8377**	0.6395**	0.1981	39.03%
South Africa	0.0127	1.2908**	1.5066**	-0.2158	57.63%
Australia	0.0100	1.2761**	1.4000**	-0.1239	71.97%
Canada	0.0066	1.4042**	1.2614**	0.1427	66.98%
New Zealand	-0.0011	1.0636**	1.2691**	-0.2055	62.08%
Norway	0.0205	1.1374**	1.9158**	-0.7784	57.28%
Sweden	0.0069	1.2963**	1.4406**	-0.1444	69.17%
Russia	0.0184	1.3934**	1.8575**	-0.4640	46.60%
Mexico	0.0219	1.1283**	1.6886**	-0.5604	75.64%
Turkey	0.0132	1.8089**	1.9455**	-0.1366	46.59%
India	0.0160	1.8458**	1.7693**	0.0764	64.63%
Argentina	0.0443	0.2536**	2.2151**	-1.9615	41.04%
Colombia	0.0275	1.1570**	1.5236**	-0.3666	43.82%
Peru	0.0248	1.4526**	1.5495**	-0.0969	40.83%
Venezuela	0.0019	0.0879	0.1137	-0.0259	0.22%

* Significant at 10%. ** Significant at 5%.

Appendix - Table A5

Spreads against Changes in HY (2005-2009)

	Coefficients				R^2
	α	β - POS	β - NEG	β - DIF	
Brazil	-0.0293	0.9378**	0.7223**	0.2155	62.26%
China	0.0095	0.6829*	1.0531**	-0.3701	37.77%
Poland	-0.0058	1.0370**	0.9069**	0.13	41.58%
Chile	-0.0276	0.9410**	0.3076	0.6334	40.32%
South Africa	-0.0093	1.2014**	1.1124**	0.089	57.38%
Russia	-0.0189	1.1811**	1.0232**	0.1579	64.37%
Mexico	-0.0174	0.9541**	0.7130**	0.2411	63.21%
Turkey	-0.015	0.9359**	0.9192**	0.0167	56.01%
Colombia	0.0015	0.1197	0.2499*	-0.1301	19.32%
Peru	-0.0186	1.0912**	1.0560**	0.0352	59.20%
Venezuela	-0.0117	0.9172**	0.4494*	0.4678	37.78%
Uruguay	-0.0376	1.2576**	0.8272**	0.4304	68.69%

* Significant at 10%. ** Significant at 5%.

Appendix - Table A6

FX against Changes in DXY (2005-2009)

	Coefficients				R^2
	α	β - POS	β - NEG	β - DIF	
Brazil	0.0076	0.5926	0.7681	-0.1755	13.83%
China	0.0043	-0.0372	0.0730**	-0.1102*	4.72%
Taiwan	-0.0008	0.4158**	0.4160**	-0.0002	43.89%
Poland	0.013	0.6809**	2.1524**	-1.4715*	67.57%
Czech Republic	0.0087	0.9515**	1.6324**	-0.681	73.34%
Singapore	0.0032	0.4945**	0.6272**	-0.1328	69.28%
Chile	0.0062	0.4313*	1.0097	-0.5784	21.64%
Korea	-0.0061	1.2123**	0.9392**	0.2731	36.97%
Israel	0.0029	0.5720**	0.7540**	-0.182	32.74%
South Africa	0.0033	0.6413**	1.6666**	-1.0253*	32.19%
Australia	0.0093	0.8254**	1.7348**	-0.9094**	61.26%
New Zealand	0.0011	0.9881**	1.2957**	-0.3076	43.33%
Sweden	0.0016	1.0911**	1.5727**	-0.4816	78.30%
Canada	0.0025	0.6503**	0.8002	-0.1499	29.89%
Russia	0.0094	0.0767	1.2962**	-1.2195	39.47%
Mexico	0.0074	0.038	1.2082**	-1.1702**	34.11%
Turkey	0.0097	-0.0039	1.3773**	-1.3812**	20.17%
India	-0.0013	0.4217**	0.4872**	-0.0655	29.95%
Argentina	0.0021	-0.2597**	0.4366	-0.6963**	16.66%
Colombia	0.0078	0.459	1.1309**	-0.6719	20.44%
Peru	0.0061	0.1359	0.6191**	-0.4833**	27.36%
Venezuela	-0.0021	0.0624	0.0519	0.0105	0.98%
Uruguay	0.0088	-0.0621	0.4277	-0.4897	4.33%

* Significant at 10%. ** Significant at 5%.