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US Long Term Interest Rates and Capital Flows to Emerging Economies

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ABSTRACT/RESUMÉ

US Long Term Interest Rates and Capital Flows to Emerging Economies

Following Chairman Ben Bernanke's comments before Congress that the FOMC may '*take a step down in the pace of asset purchases if economic improvement appears to be sustained*', US 10-year interest rates picked up sharply and *gross* capital flows to emerging market economies (EMEs) reversed. These events raised concerns that further increases in US interest rates could trigger sharp changes of capital flows that would be followed by financial crises in EMEs. To assess this possibility, this paper studies the association between US long term interest rates and cycles of capital flows to EMEs. It finds that, indeed, cycles in capital flows to EMEs are linked to global conditions, including global risk aversion and long term interest rates in the United States. In particular, higher US long term interest rates are associated with lower levels of gross capital flows to EMEs, and to a higher probability of observing sharp reversals in those flows. Episodes of net capital inflows, on the other hand, are mostly associated with domestic macroeconomic conditions. In particular, economies with relatively low levels of gross outflows, with a high ratio of short-term debt to international reserves or with weak domestic fundamentals are more vulnerable to the risk of a classic sudden stop à la Calvo. This Working Paper relates to the *OECD Economic Survey of the United States 2014* (www.oecd.org/eco/surveys/economic-survey-united-states.htm)

JEL Classification codes: E32; F32; F41; G10; G12; G15
Keywords: interest rates, capital inflows, asset prices, sudden-stops, exchange rate regimes

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Taux d'intérêt à long terme des États-Unis et flux de capitaux vers les pays émergents

Après les commentaires de Ben Bernanke devant le Congrès que le FOMC pourrait "ralentir dans le rythme des achats d'actifs si l'amélioration économique semble se maintenir», les taux d'intérêt américains à 10 ans ont fortement remontés et les flux de capital brut vers les économies émergentes (EME) se sont inversés. Ces événements ont soulevé des préoccupations que de nouvelles hausses des taux d'intérêt américains pourraient déclencher des changements brusques de flux de capitaux qui seraient suivies par des crises financières dans les pays émergents. Pour évaluer cette possibilité, ce document étudie l'association entre les taux d'intérêt à long terme des États-Unis et les cycles de flux de capitaux vers les pays émergents. Il constate que, en effet, les cycles des flux de capitaux vers des pays émergents sont liés à la conjoncture mondiale, y compris l'aversion au risque global et les taux d'intérêt à long terme aux États-Unis. En particulier, la hausse des taux d'intérêt à long terme américains sont associés à des niveaux plus bas de capital flux bruts de pays émergents, et à une plus grande probabilité d'observer des inversions brutales des flux de capitaux. Cependant, cette association ne vaut que pour les flux de capitaux mesurées en termes bruts. En outre, l'étude ne trouve aucune preuve d'un lien entre les taux d'intérêt à long terme des États-Unis et les flux de capitaux, mesurée en termes nets. Les principaux facteurs associés aux flux nets de capitaux sont les conditions macro-économiques nationales. Ce Document de travail se rapporte à l'*Étude économique de l'OCDE des Etats-Unis 2014* (www.oecd.org/fr/eco/etudes/etats-unis.htm).

Classification JEL : E32; F32; F41; G10; G12; G15
Mot Clés : taux d'intérêt ; flux de capitaux ; prix d'actifs ; déséquilibres financiers; les régimes de taux de change

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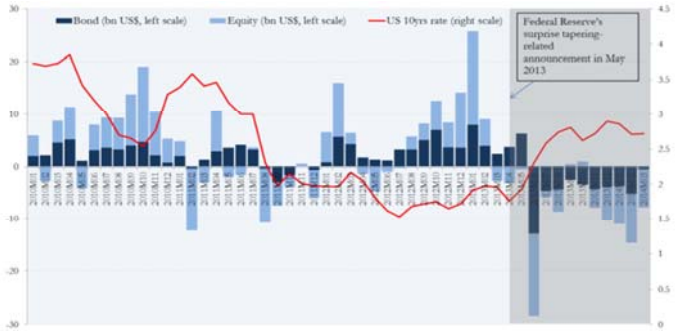
by Eduardo Olaberría[2]

1. Introduction

Following Chairman Ben Bernanke's comments before Congress that the FOMC may '*take a step down in the pace of asset purchases if economic improvement appears to be sustained*',[3] US 10-year interest rates picked up sharply and gross capital flows to emerging market economies (EMEs) reversed (see Figure 1). These developments caused some worries across the developing world and many analysts have suggested that, as *Quantitative Easing* (QE) ends, long term interest rates in the United States will increase further[4] and, as a result, the flow of capital to EMEs will come to a sudden stop that could lead some of these economies to a full blown financial crisis like the ones in Latin America and Asia in the 1990s (Eichengreen and Gupta, 2014).

Figure 1. Capital flows to emerging economies and US 10-year interest rate



Source: Datastream and EPFR

1. The opinions expressed and arguments employed in this paper are the responsibility of the author and do not necessarily reflect the official views of the OECD or of the governments of its member countries.

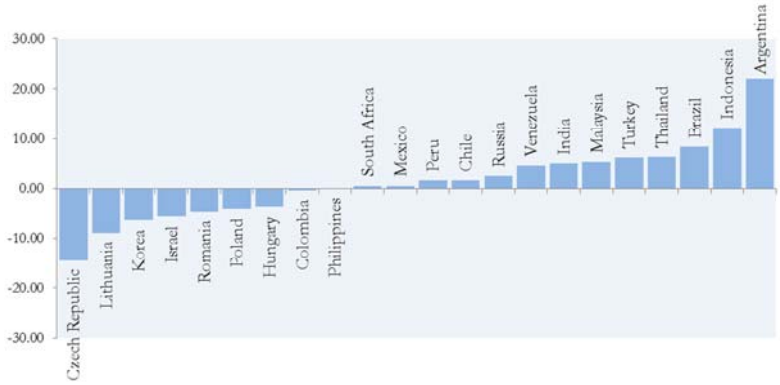
2. OECD Economics Department. The author would like to thank Patrick Lenain, Douglas Sutherland, Christian Daude, Cyrille Schwellnus and participants in the Economics Department Brown Bag seminar for valuable comments and suggestions, and Heloise Wickramanayake for editorial assistance. Contact: eduardo.olaberria@oecd.org.

3. Federal Reserve Chairman Ben Bernanke gave testimony to the Joint Committee of Congress on 22 May, 2013. When asked by the Chairman of the Joint Committee Mr. Brady "*When do you expect this strategy* [tapering Quantitative Easing] *to begin?*", Bernanke answered "…*if we see continued improvement and we have confidence that that is going to be sustained, then we could in the next few meetings, take a step down in our pace of purchases*".

4. The main objective of Quantitative Easing (QE), as stated in Dudley (2010), was to reduce long-term interest rates to spur economic activity. Indeed, there is significant evidence (see Gagnon et al., 2010; Swanson, 2011; and Krishnamurthy and Vissing-Jorgensen, 2010) that QE was effective at reducing long-term interest rates. Since tapering is the process of reducing the pace of these purchases, a potential implication will be higher US long term interest rates, something already observed in the second half of 2013 after Fed Chairman Bernanke's announcement. However, it is not clear whether the end of QE will generate further increases in US long terms interest rates. Although some analysts predict this will happened, others – most notably the International Monetary Fund in the recent WEO (April, 2014) and former US Treasury Secretary Larry Summers - predict that interest rates will remain low. This paper does not take a position on this; the goal is to understand the association between US interest rates and capital flows to EMEs.

However, other analysts argue that changes in US interest rates are not responsible for cycles of capital flows to EMEs and that these cycles are a consequence of the countries own macroeconomic policies. This argument is supported by the fact that not all EMEs were affected in the same way after Bernanke's announcement (Mishra et al., 2014). For example, the index of Exchange Rate Market Pressure (ERMP) shows that the EMEs hit hardest during the second half of 2013 were those with relatively weaker domestic fundamentals, like Argentina, Indonesia, Turkey, India and Brazil (see Figure 2).[5] In general, these are economies that have been suffering from marked growth slowdown, substantial fiscal and current-account deficits, and uncertainty about future economic policy because of upcoming elections with uncertain outcomes.[6] More generally, Figure 3 suggests that countries hit hardest are those that at the beginning of 2013 had relatively low levels of international reserves (as percentage of GDP), high current account deficits, and high debt to GDP ratio.

Figure 2. Exchange rate market pressure between May and December or 2013



Source: Author's own calculations based on data from IMF.

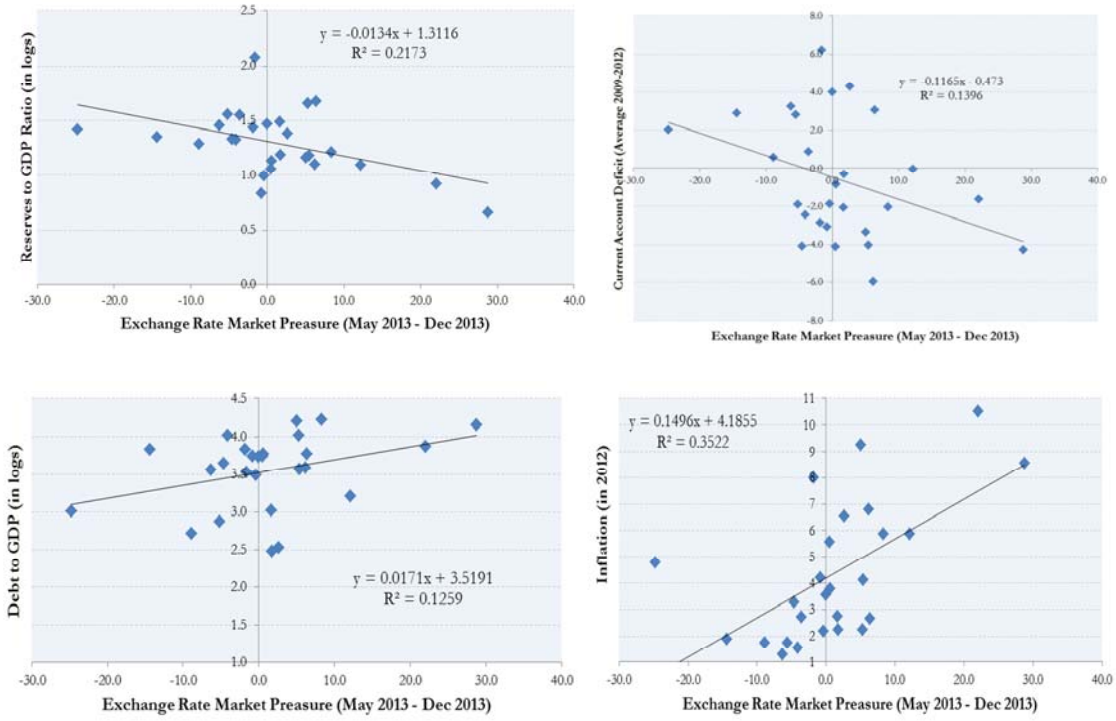
The goal of this paper is to analyse, in light of recent historical evidence, which of these views is right. Are cycles of capital flows to EMEs associated with US-long-term interest rates? Or are they a consequence of the countries own macroeconomic policies? To answer these questions, the paper applies two empirical approaches to a panel of quarterly data that includes 30 EMEs during the period 1990-2012. While the first methodology estimates how global and domestic factors are associated with the level of capital flows (as percentage of GDP), the second estimates how these factors are associated with the probability of observing episodes of sharp changes in capital flows.

5. ERMP is the weighted sum of currency depreciation and loss in international reserves, which is a good proxy for what's happening to net capital flows in these economies. Specifically, it is measured as follows: $ERMP = \frac{\sigma_{er}}{\sigma_r+\sigma_{er}}\Delta ER - \frac{\sigma_r}{\sigma_r+\sigma_{er}}\Delta R$, where σer is the volatility of the exchange rate, σr is the volatility in international reserves, ΔER is the change in the exchange rate between May and December of 2013 (in percentage terms) and ΔR is the change in international reserves between May and December of 2013 (in percentage terms). The weights are design so that for countries that have a relatively fixed exchange rate the change in reserves has a relatively higher weight, while for countries that have a more flexible exchange rate, the change in the exchange rate has a relatively higher weight.

6. Other economies (e.g. Russia, Ukraine, etc.) are being affected by the (unexpected) crisis in Crimea, which is creating doubts about Russia's intentions in the region and will probably affect investors' expectations in these economies, or by China's slowing growth and its negative effects on global demand and commodity prices (e.g. Chile and Peru).

The paper estimates separately the association of global and domestic factors with *gross* capital inflows by foreign investors, *gross* capital outflows by domestic investors and *net* capital flows. *Gross* capital inflows are changes in the country's liabilities with the rest of the world; in other words, investment by foreign residents in domestic assets. These investments include foreign direct investment, portfolio equity and debt, and loans. *Gross* capital outflows are changes in investment by domestic residents in assets of foreign countries. *Net* capital inflows are calculated as the difference between gross inflows and gross outflows; it is the sum of the flows of foreign claims on domestic capital (change in liabilities) and the flows of domestic claims on foreign capital (change in assets) in a given period.

Figure 3. Exchange rate market pressure and domestic factors



Source: Author's own calculations based on data from IMF and Abbas et al (2013).

The results suggest that *gross* capital flows to EMEs are associated with a global financial cycle, including global risk aversion (VIX) and US long term interest rates. The results suggest that periods when long term interest rates in the United States are relatively high are associated with lower levels of *gross* capital inflows by foreign investors to EMEs and with a higher probability of observing episodes of sudden stops in *gross* capital flows to and from EMEs. Specifically, when US interest rates are high, there is a higher probability of episodes of *stops* in *gross* capital inflows by foreign investors and *retrenchment* in *gross* capital outflows by domestic agents.[7]

Finally, according to the results in this paper, episodes of sharp changes in net capital flows are mainly associated with weak domestic macroeconomic conditions. Economies with weak growth, with relatively low levels of gross outflows, with a high ratio of short-term debt to international reserves or with

7. These episodes are defined as detailed below. In short, Stops are sharp reversals in gross capital inflows, and Retrenchments sharp decrease in gross capital outflows.

weak domestic fundamentals are more vulnerable to the risk of a classic sudden stop à la Calvo. When these events occur, the expected costs in terms of GDP lost can be significant.

This paper relates to recent studies analyzing the effect of changes in US monetary policy of QE on EMEs (e.g. Aizenman et al, 2014; Eichengreen and Gupta, 2014; Lim et al, 2014; World Bank, 2014; Nechio, 2014; Powell, 2014; Adler et al., 2014 and Mishra et al., 2014). A main difference with these studies is the focus. The focus of Aizenman et al. (2014), Eichengreen and Gupta (2014) and Mishra et al. (2014) is quite different from this paper since they look at how Chairman Bernanke's announcement on May 2013 affected asset prices in EMEs. The studies by Lim et al. (2014), World Bank (2014), Powell (2014) and Adler et al. (2014) are closer in spirit to this paper, but while the first three focus on *gross* inflows by foreign investors, this paper and Adler et al. (2014) look also at *gross* outflows by domestic investors and *net* flows. This is important because looking only at gross inflows by foreign investors provides a partial picture that can drive to wrong conclusions. For example, it is entirely possible to absorb a *stop* in *gross* private capital inflows by foreign investors with a sudden *retrenchment* of *gross* capital outflows by domestic investors without significant implications to current account deficits. On the other hand, focusing solely on *net* capital inflows can also be misleading. As was recently argued by Forbes and Warnock (2012) "*analysis based solely on net flows, while appropriate a few decades ago, would miss the dramatic changes in gross flows that have occurred over the past decade and ignore important information contained in the these flows. As domestic investors' flows have become increasingly important, changes in net flows can no longer be interpreted as being driven solely by foreigners*".

The main differences with Adler et al. (2014) are the empirical methodology and the scope. This paper not only studies the association between US interest rates and the level of capital inflows to EMEs -- as is done in World Bank (2014), Lim et al. (2014) and Adler et al. (2014)--, but also the association with the probability of episode of sharp changes in capital flows as done in Forbes and Warnock (2012). Finally, it differentiates from Forbes and Warnock (2012) by focusing only on EMEs, and by studying how persistent current account and fiscal deficits, the stock of outflows, international reserves and the exchange rate regimes affect the probability of observing episodes of *sudden stops* in *net* terms.

2. Conceptual framework

Theory suggests that the factors driving cycles of capital flows can be divided in two categories: (1) those that are external to the economies receiving the flow (the so-called global or push factors), and (2) the factors internal to those economies (generally called domestic or pull factors). For example, from a theoretical point of view, the implications of higher world interest rates for capital flows to EMEs are quite clear. Consider a small open economy with endogenous investment and free capital mobility populated by a representative (and atomistic) agent that receives utility from the consumption of two types of goods: tradable and non-tradable. In such a model, an increase in world interest rates should decrease investment, increase savings and generate *net* capital outflows. But theory also suggests that domestic factors –proxies for the macroeconomic, fiscal and financial situation of the country- are important. For instance, the same model would suggest that higher growth of the domestic economy –or better institutional quality- will attract more capital inflows from foreign investors, and, through income effects, increase investment abroad by domestic agents. In sum, according to theory, domestic factors interact to make the economies either a fertile territory for capital flows or a place that expels them.

On the empirical side, there is an extensive list of studies (e.g., Calvo et al., 1996; Fernandez-Arias, 1996; Fratzscher, 2012; Blanchard et al., 2010) suggesting that push factors are the most important drivers of capital flows to emerging economies. But there are also studies emphasizing the role domestic factors, are also important determinants of capital flows (e.g., Milesi-Ferreti et al., 2010; Calvo et al., 2008; Reinhart and Reinhart, 2009).

Recently, a number of studies have stressed the importance of distinguishing the association that global and domestic factors have with *gross* capital flows, from the association they have with *net* capital flows (Forbes and Warnock, 2012; Rey, 2013; Calderon and Kubota, 2013; Broner et al., 2013). For example, Rey (2013) shows that while global factors, specifically global risk aversion (VIX), are strongly associated with capital flows in *gross* terms they are not significantly associated with capital flows in *net* terms.

But from a policy and empirical points of view, an important question in the current environment is whether there is evidence that higher US long term interest rates –since that is what the end of QE is expected to create- are associated with lower levels of capital flows to EMEs, or even worse, with a higher probability of sudden stops. The next section answers these questions.

3. Data, estimation and results

This section estimates the determinants of cycles of capital flows to EMEs using two empirical approaches. The first employs a panel regression to assess the relative importance of global and domestic factors in determining the level of capital flows to EMEs. This approach is useful to understand the long term association between global and domestic factors and the level of capital flows. However, this approach is less suited for evaluating how these factors can affect the probability of having episodes of sharp changes in capital flows. Therefore, the second empirical approach estimates how global and domestic factors affect the probability of occurrence of different episodes of extreme capital flow reversals. This distinction is very important. For example, according to Larry Summers, macroeconomics is not about explaining the small wiggles in macroeconomic variables; it is about explaining events that, like sudden stops in capital flows, have the potential of generating large drops in activity. The second empirical approach is designed to do precisely that.

3.1. Data

To study the association between US long term interest rates and patterns of capital flows by domestic and foreign agents across EMEs, this paper assembles a comprehensive dataset on *gross* and *net* capital flows. The data on capital flows come from the analytic presentation of the IMF's Balance of Payments Statistics Yearbooks (BOP). The data on the other relevant macroeconomic variables come from the International Financial Statistics (IFS), OECD, Datastream, Abbas et al (2013) and the World Development Indicators (WDI). Table A.1. in the appendix provides a detailed explanation on how the variables were constructed and of the sources.

3.2. Behavior of capital flows to EMEs in the last two decades

To begin the analysis of cycles of capital flows to EMEs during the last two decades, Figure 4 shows the evolution of *gross* capital inflows and *gross* capital outflows in 9 EMEs, three from Asia, three from Europe and three from Latin America. The figure shows three stylized facts. The first is that there is a strong positive comovement between *gross* capital inflows and *gross* capital outflows, which indicates that when foreign agents increase their investment in domestic markets, domestic agents also increase their investments abroad. Although there are periods in which the comovement breaks, these breaks are not necessarily correlated across countries. For instance, for Asian countries, there seems to be a break during the crisis of 1997, where *gross* inflows decreased sharply and, except in Korea, *gross* outflows were not significantly affected. But the comovements hold in general, even during the recent global financial crisis when most countries had a stop in gross inflows by foreign investors and retrenchments in gross outflows by domestic investors.

Second, the figure suggests that *gross* capital flows behave very differently compared to *net* capital flows (which is the difference between the lines), except in countries or periods when *gross* inflows are significantly higher than *gross* outflows. And third, although inflows and outflows generally comove in all countries, *gross* inflows are significantly higher than *gross* outflows in some EMEs like Brazil and Turkey. Furthermore, this seems to have been the case in most EMEs during the 1990s.

Figure 4. Gross capital inflows and gross capital outflows as % of GDP (1990q4-2012q4)

Furthermore, *gross* capital flows seem to follow a common cycle across EMEs. To show this, Table 1 presents the correlation of capital inflows in *gross* and *net* terms across EMEs regions (i.e. Latin America, Emerging Europe, Emerging Asia and Africa). The evidenced is very clear: *gross* capital inflows -and *gross* capital outflows- are positively correlated across regions. For example, the correlation of *gross* capital inflows between Latin America and Emerging Europe is 0.63, between Latin America and Asia is 0.72 and between Emerging Europe and Asia is 0.58. The average correlation for *gross* capital inflows across the different regions is 0.63. A similar pattern holds for *gross* outflows: the correlation is 0.56 between Latin America and Emerging Europe, 0.65 between Latin America and Asia, and 0.46 between Emerging Europe and Asia. On average, the correlation of *gross* capital outflows across the different regions is 0.45. Hence, for EMEs there is a commonality in *gross* capital flows across different regions.

However, the correlation is relatively low for *net* flows: it is on average 0.32-, suggesting that the cycle of capital flows across EMEs exists in *gross* terms, but not in *net* terms.

Table 1. Correlation between capital flows of different regions

Correlation between:	Gross Inflows	Gross Outflows	Net inflows
Latam and Europe	0.63	0.56	0.25
Latam and Asia	0.72	0.65	0.45
Latam and Africa	0.61	0.46	0.45
Asia and Europe	0.58	0.45	0.28
Asia and Africa	0.61	0.40	0.27
Africa and Europe	0.63	0.21	0.19
Average	0.63	0.45	0.32

Similarly, Table 2 reports the correlation between US 10-year interest rate (a main variable of interest in this paper) and capital flows across different regions of the emerging world. It shows that there is a significant negative correlation between US long term interest rates and gross capital inflows to EMEs (-0.28 for Latin America, -0.41 for Emerging Europe, -0.11 for Asia and -0.23 for Africa). This means that when US interest rates are high, capital inflows by foreign investors to EMEs are relatively low. But the correlations are even higher between US 10-year interest rates and gross capital outflows by domestic investors of EMEs (-0.43 for Latin America, -0.40 for Emerging Europe, -0.29 for Asia and -0.11 for Africa), being -0.31 on average, suggesting that when US interest rates are high, capital outflows from EMEs are low.

Table 2. Correlation between US 10 yrs interest rates and different types of capital flows across regions

Correlation between US 10yrs interest rate and flows to:	Gross Inflows	Gross Outflows	Net inflows
Latin America	-0.28	-0.43	0.00
Europe	-0.41	-0.40	-0.16
Asia	-0.11	-0.29	0.26
Africa	-0.23	-0.11	-0.18
Average	-0.26	-0.31	-0.02

Furthermore, the correlation between US 10-year interest rate and *net* capital inflows is significantly lower. In fact, it is zero for Latin America and positive (0.26) for Asia. To summarize, there seems to be a global cycle in capital flows to EMEs, and this cycle seems to be associated with long term interest rates in the United States. However, this cycle holds for capital flows in gross terms, and not necessarily in net terms. Are these correlations statistically significant? Do they remain significant when we control for other global and domestic factors affecting capital flows? The following section answers these questions.

3.3. Empirical approach I: Explaining the level of capital flows

This section estimates how the level of *gross* and *net* capital flows to emerging countries are associated with global and domestic factors. We estimate the association with *gross* capital inflows, *gross* capital outflows and *net* capital flows separately. In particular, we estimate a standard regression equation designed for estimation using (cross-country, time-series) panel data:

$$CF_{i,t} = \delta + \alpha CF_{i,t-1} + \beta_1 Global_t + \beta_2 Domestic_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t}, \quad (3.2)^{8}$$

8. Equation (3.2) may suffer from different estimation problems, some of which are discussed below.

where the subscripts *i* and *t* represent country and time period, respectively; CF represents capital flows to EMEs as a percentage of GDP, *Global* refers to global factors and *Domestic* to domestic factors to be described below. Finally, μ_t, η_i, and ε_{it} denote unobserved time- and country-specific effects, respectively; and ε is the error term.

To perform the estimations, a pooled cross-country and time-series data panel is compiled covering 30 emerging market economies over the period 1990q1-2012q4 (see Table A.1. in the annex for the sample of countries). The panel is unbalanced, with some countries having more observations than others. Table A.2. and A.3. in the appendix provide summary statistics of the variables and a matrix of pair-wise correlations.

Results

Table 3 reports the results of estimating equation (3.2). Each column in the Table corresponds to a different definition of capital flows. For instance, the first column represents *gross* inflows, the second column represents *gross* outflows, and the third *net* inflows. The regressions include the following variables as global (or push) factors: (1) the interest rate on US 10-years Treasury bonds,[9] (2) the degree of risk aversion (VIX), (3) GDP growth in the G7 economies; and the following variables as domestic (or pull) factors: (1) economic growth, (2) the country's institutional rating,[10] and (3) domestic interest rates. The three regressions include the lag of the dependent variable which is always positive and significant suggesting persistence in the level of capital flows.

The results are broadly consistent with the recent literature on how global and domestic factors are associated with capital inflows (Fratzscher, 2012; World Bank, 2014; and Powell, 2014). Suggesting an important association between global factors and *gross* capital inflows, international risk aversion (VIX) and the US 10-year interest rate are negative and statistically significant. Both higher risk aversion and US interest rates are associated with lower levels of *gross* capital inflows in EMEs. Higher growth rates in advance countries, on the other hand, are associated with higher *gross* capital inflows to EMEs, but the effect is not statistically significant. On the other hand, domestic factors are also significantly associated with capital inflows. Both domestic growth and institutional rating are positive and significant, suggesting that the higher they are, the higher the level of gross capital inflows to EMEs. Domestic interest rate seems to be positively associated with *gross* capital inflows, but the association is not statistically significant.

Regarding gross capital outflows by domestic investors (column 2), once again, the results suggest an important role of global factors. The coefficients for US interest rates and international risk aversion are negative and statistically significant: higher international interest rates and global risk aversion are associated with a lower level of gross capital outflows by domestic investors. Domestic factors are also associated with the level of capital outflows. Institutional quality is positive and significant: the higher the rating, the higher is the level of gross capital outflows. However, domestic growth and domestic interest rate do not have a significant association with the level of gross outflows.

Finally, the results for net capital inflows (column 3) confirm the suspicion insinuated above: global factors are not significantly associated with the level of net flows of capital to EMEs. Although higher US interest rate and global risk aversion seem to be negatively related with net capital flows, the results are not

9. The paper focuses on US long term interest rates, as opposed to interest rates in other advanced economies, because that is what the end of QE is expected to affect.

10. This exercise uses only three variables as domestic factors since the main purpose is to use them as control variables to study the link between capital flows and global factors. Later, when the exercise seeks to find out which are the domestic factors most significantly associated with episodes of capital flow volatility, a richer set of variables is employed.

statistically significant. Domestic factors, on the other hand, are significant with the exemption of domestic interest rate. Both higher domestic growth and higher institutional rating are associated with a higher level of net capital inflows in EMEs.

Table 3. Determinants of gross capital flows to emerging economies

VARIABLES	(1) Gross Inflows	(2) Gross Outflows	(3) Net Inflows
Lagged dependent variable	0.9088***	0.9259***	0.9203***
	[0.009]	[0.004]	[0.018]
Global Factors:			
U.S. 10 yrs interest rate	-0.1392**	-0.0728**	-0.0422
	[0.057]	[0.034]	[0.055]
VIX (in logs)	-1.5006***	-1.0331**	-0.4628
	[0.440]	[0.411]	[0.348]
Growth G7 countries	0.1168	0.1043	0.0471
	[0.108]	[0.088]	[0.075]
Domestic Factors:			
GDP growth	0.1240***	0.0107	0.0911***
	[0.035]	[0.021]	[0.031]
Institutional Quality	0.9442**	0.7535**	0.2156*
	[0.466]	[0.326]	[0.106]
Domestic interest rate	0.0022	0.0058	-0.0226
	[0.014]	[0.008]	[0.019]
Constant	8.1621***	5.9211***	1.0530
	[2.406]	[1.992]	[0.890]
Observations	1,444	1,412	1,412
Number of countries	30	30	30

Robust clustered standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

How important are these results quantitatively?

To explore the quantitative implications of these results, Figure 5 shows the response of capital inflows to a change of one standard deviation in each of the global and domestic factors, disaggregated by *gross* inflows, *gross* outflows, and *net* flows.

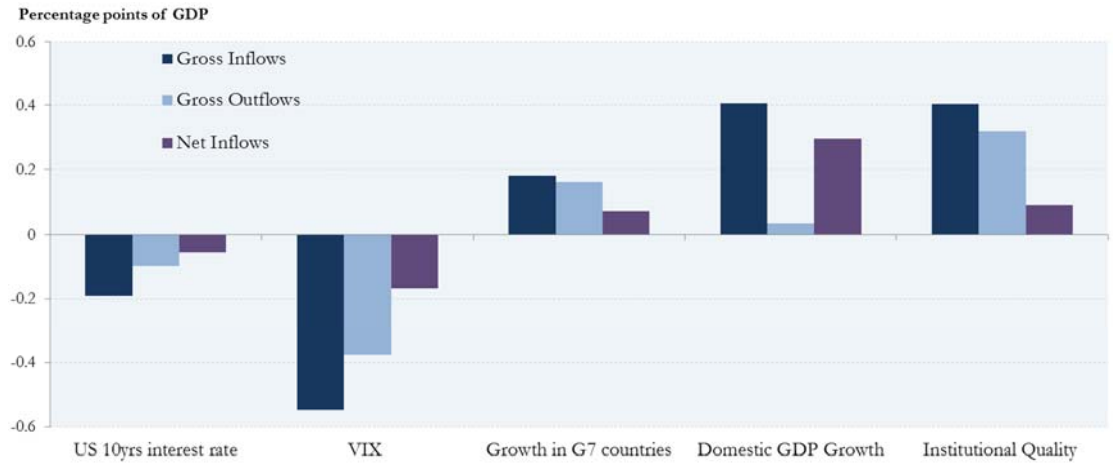
Figure 5 shows that a shock of one standard deviation to US 10-year interest rates (equivalent to an increase of about 150 basis points) is associated with a reduction in the level of *gross* capital inflows to EMEs of 0.2 percentage points (pp) of GDP, a reduction of *gross* outflows of 0.12 pp of GDP, and a reduction of *net* inflows of 0.06 pp of GDP (though this effect is not statistically significant).

For the other global factors, Figure 5 shows that while a one standard deviation shock in global risk aversion (VIX) is associated with a reduction 0.52 pp of GDP in gross inflows, 0.39 pp in gross outflows, and of 0.16 pp in net inflows; a one standard deviation shock of GDP growth in G7 countries increases gross inflows by about 0.14 pp, gross outflows by 0.1 pp and net inflows by 0.04 pp.

Regarding domestic factors, a one standard deviation shock in domestic GDP growth is associated with increases in *gross* inflows by 0.39 pp, *gross* outflows 0.1 pp, and *net* inflows by 0.32 pp of GDP. Finally, a one standard deviation increase in the country's institutional rating is associated with a rise of about 0.4 pp of GDP in *gross* inflows, 0.09 pp in *gross* outflows and 0.25 pp in *net* inflows.

In sum, while the association of capital flows (measured in gross terms) with global factors - especially global risk aversion- seems to be quantitatively more important, domestic factors are clearly the most important factors associated with capital flows when measured in *net* terms.

Figure 5. Response of capital flows to a shock of one standard deviation in global and domestic factors



Note: The marginal effects are calculated using the coefficient in Table 3 and the standard deviations of each variable.

Endogeneity and Robustness

The results presented in Table 3 may be subject to a number of estimation problems. First, since equation (3.2) is a dynamic model with fixed effects, the estimates could be biased for finite T (i.e. Nickell Bias). Although the time coverage of the dataset is relatively long –which means that the inconsistency of estimates should not pose a major problem since the bias is of *O(1/T)*-, to address this issue Table A4 (columns 1 to 3) in the appendix presents the results of estimating equation (3.2) using bias-corrected Least

Squares Dummy Variables (LSDV) (as suggested in Bruno (2005)), under the strictest condition for bias approximation (up to *O(1/NT2))*, with bootstrapped standard errors. Also, columns 4 to 6 present the result of estimating equation (3.2) by OLS but excluding the lagged dependent variable. The results are similar to Table 3. The main difference is that now US 10-year interest rates and institutional quality are no longer statistically significant. Global risk aversion and domestic growth remain significant and have the same signs as in Table 3.

Second, the results presented in Table 3 assume that domestic growth, institutional quality and domestic interest rate are exogenous to capital flows. This, however, need not be the case. Indeed, it is possible that large capital inflows affect the country's growth rate, its institutional rating and domestic interest rates. For example, more inflows can push domestic interest rates down, promote investment and growth. Also, since most institutional rating measures are constructed ex post, analysts might have a natural bias toward assigning better ratings to countries having capital inflows. If this is the case, estimates that ignore potential endogeneity will be biased. One way to address this issue is to use past observations of these variables as instruments. Table A.4. (columns 7 to 9) in the appendix presents results of applying the System GMM methodology (developed by Arellano and Bond) that takes care of these endogeneity problems. As before, the results are very similar to Table 3. The main difference is that institutional rating is no longer significant and US 10-year interest rate is not statistically significant for capital outflows.[11]

Finally, the results presented in Table 3 are obtained using quarterly data and some authors argue that since for EMEs the quality of quarterly data is poor, to obtain consistent and credible estimates annual data should be used. To address this issue, Table A.5. in the appendix presents the same estimations as Tables 3 and A.4. but employing annual data. Once again, the main results of Table 3 hold: global factors, in particular global risk aversion and to a lesser extent US 10-year interest rate, are significantly associated with capital flows to EMEs in *gross* terms, but not necessarily with capital flows in *net* terms. For *net* capital inflows domestic factors, such as domestic growth, are relatively more important.

3.4. Empirical approach II: Factors associated with episodes of sharp changes in capital flows

The previous methodology is useful to gauge the long run association between global and domestic factors and the level of capital flows (as percentage of GDP) to EMEs, but does not say anything about how these factors affect the probability of observing sharp changes of capital flows, which is an issue of main concern in this paper. History shows that episodes of sharp decreases in capital flows can create credit crunches that are followed by painful recessions and extremely slow recoveries (Edwards, 2007; Reinhart and Reinhart, 2009; Reinhart and Rogoff, 2013).

To assess the role of global conditions, in particular the US interest rate, in determining the conditional probability of observing episodes of sharp changes in capital flows, this paper follows Forbes and Warnock (2012).

To do this, the first step is to define the following episodes regarding capital flows to EMEs:

- **Surges**: a sharp increase in gross capital inflows by foreign investors;
- **Stops**: a sharp decrease in gross capital inflows by foreign investors;
- **Flight**: a sharp increase in gross capital outflows by domestic investors;
- **Retrenchment**: a sharp decrease in gross capital outflows by domestic investors.

11. There are some issues with the Arellano-Bond methodology given the length of the panel. Arellano and Bond should be applied to panels that have large *n* and small *T*, which is not the case of our panel.

To identify, for example, a stop episode, we first calculate the annual flow (the sum of gross capital inflows during the previous 4 quarters) and compute the changes relative to the previous period. Then, we compute 5-year rolling means, and standard deviations of the changes. To qualify as a stop episode, there must be at least one quarter when annual flows decrease at least two standard deviations below its 5-year rolling mean. Once this condition is satisfied, the next step is to identify the entire episode. The episode starts the quarter in which annual inflows is more than one standard deviation below its rolling mean, and ends once annual inflows falls below one standard deviation below its rolling mean. The other episodes are estimated in a similar way.

Once all the surges, stops, flights and retrenchments episodes are identified, they are used as dependent variable to estimate the following Probit model (the same model used in Forbes and Warnock (2012) but applied only to EMEs):

$$Prob(e_{it} = 1) = F\left(\theta_t^{Global} B_G + \theta_{it}^{Domestic} B_D\right) \quad (3.3)$$

As before, global factors include the interest rate in 10-year US bonds, the VIX and Growth of G7. However, to have more details on which domestic factors are affecting the probability of episodes of extreme changes in capital flows, the regression includes a richer set of variables: i.e. Growth of GDP, Financial depth, financial and trade openness and GDP per capita.

Results

Table 4 reports the results of estimating equation (3.3) for surges, stops, flights and retrenchments episodes. Despite the fact that the sample of countries is quite different, the results are fully consistent with Forbes and Warnock (2012). Higher US long term interest rates are associated with a higher probability of stops and retrenchment episodes. Higher levels of global risk aversion are positively correlated with stops and retrenchment and negatively correlated with surges and flight. Strong G7 growth is associated with a higher probability of surges and a lower probability of stops and retrenchment.

Table 4. Determinants of Surge, Stop, Flight and Retrenchment episodes in *Gross* flows

VARIABLES	(1) Surges	(2) Stops	(3) Flight	(4) Retrenchment
Global Factors:				
US 10yrs interest rate	-0.1052	0.1784**	-0.0641	0.2258***
	[0.077]	[0.074]	[0.069]	[0.075]
G7 growth	0.1472***	-0.1890***	0.0456	-0.1528***
	[0.049]	[0.032]	[0.036]	[0.031]
VIX	-0.5431***	0.6668***	-0.7357***	0.6408***
	[0.160]	[0.155]	[0.152]	[0.153]
Domestic factors:				
Financial depth	-0.1207	0.2298	-0.6345**	0.6033***
	[0.279]	[0.216]	[0.249]	[0.224]
Trade	-0.2272	0.0096	-1.4516***	0.1947
	[0.361]	[0.326]	[0.321]	[0.317]
Financial Openness	0.1347*	0.0274	-0.1259**	0.0026
	[0.076]	[0.065]	[0.063]	[0.065]
Domestic GDP growth	0.1308***	-0.1072***	0.0256	-0.0263
	[0.025]	[0.017]	[0.019]	[0.017]
GDP per capita	0.9770	0.6172	2.3274***	-0.2180
	[0.740]	[0.629]	[0.672]	[0.649]
Constant	-7.0726	-9.0628*	-11.8190**	-4.4956
	[5.693]	[5.151]	[5.247]	[5.228]
Observations	1,292	1,316	1,281	1,302

Robust clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

In contrast to the significant results for global factors, few domestic factors are consistently associated with a higher probability of episodes of sharp change of gross capital flows. While stops are less likely in countries experiencing a positive growth shock, surges are more likely in countries with a positive growth shock. Flight episodes are relatively more idiosyncratic, and are more likely in countries with higher GDP per capita and less likely in countries more open to trade and more financially developed and open.

The two most remarkable results from Table 4 are: First, that US 10-year interest rates are not significantly related to two extreme capital flow episodes: surges and flight (the results do suggest that stops and retrenchments are more likely when US interest rates are high).

Second, the results provide no evidence in support of the view that capital controls (the opposite of Financial Openness) can reduce the probability that a country has a stop episode; in other words, capital controls do not seem to reduce the probability of sharp changes of capital inflows when measured in gross terms. However, capital controls may increase the probability of capital flight episodes (domestic investors sending money abroad) and reduce the probability of surges episodes (foreign investors investing in the country).

Episodes of extreme net capital flows

Table 5 uses as dependent variable episodes of extreme capital flow movements but identified in *net* terms rather than *gross*. Here there are only two possibilities: a *surge* in net capital inflows (column 1), or a classic *sudden stop* in *net* capital inflows á la Calvo (column 2).

A clear difference between the results in Table 4 and Table 5 is the significance of global factors. While global factors were significantly associated with all episodes of extreme capital flows in *gross* terms, they are not significantly associated with extreme episodes in *net* terms. In particular, US 10-year interest rate, which was significantly associated with two episodes based on gross flows, is not significantly related to either episode based on net flows.

These results support the point raised earlier in the paper that although global factors could be the main driving forces of episodes of capital flows when measured in gross terms, they are not a main factor explaining episodes of capital flows measured in net terms. This difference occurs because actions by foreign and domestic investors can counteract each other: while lower (higher) US long term interest rates and global risk aversion are associated with an increase (decrease) in capital inflows by foreigners, they are also associated with an increase (decrease) in capital outflows by domestic residents. As a result, the association between US long term interest rates and changes in the aggregated *net* capital flows is not statistically significant.

A second key result from the regressions in Table 5 is that the main driving forces of episodes of extreme *net* capital inflows are domestic factors. For example, the results suggest that countries are more likely to have an episode of sudden stop if they have lower GDP growth, more stringent capital controls and are less open to international trade. But how do persistent current accounts and fiscal deficits, international reserves, the exchange rate regime or the level of debt affect the probability of sudden stops in EMEs? The next sub-section answers this question.

Table A.6. in the appendix presents a robustness check of the estimations of Tables 4 and 5 but using annual data instead of quarterly data. Most of the conclusions remain, except for the results regarding US 10-year interest rates and capital controls. In particular, US 10-year interest rates are no longer significantly associated with episodes of sharp changes in gross capital flows. The results that are very robust to these estimations are the ones related to global risk aversion and domestic factors such as domestic growth and trade openness. Higher global risk aversion increases the probability of episodes of Stops and Retrenchments while decreasing the probability of Surges and flights. However, it is not significantly associated with episodes of sharp changes in capital inflows when measured in net terms.

Table 5. Determinants of episodes of Surge and Stops of net flows

VARIABLES	(1) Sudden Surges	(2) Sudden Stops
Global Factors:		
US 10yrs interest rate	0.0439	0.0584
	[0.074]	[0.071]
G7 growth	0.0246	-0.0478
	[0.036]	[0.030]
VIX	-0.1719	-0.0118
	[0.149]	[0.143]
Domestic factors:		
Financial depth	0.4943**	-0.1181
	[0.239]	[0.218]
Trade	0.2011	-0.8765***
	[0.353]	[0.319]
Financial Openness	-0.0956	-0.2041***
	[0.068]	[0.063]
Domestic GDP growth	0.0726***	-0.0538***
	[0.020]	[0.016]
GDP per capita	-0.3024	1.5294**
	[0.677]	[0.626]
Constant	-0.8527	-10.3874**
	[5.358]	[5.062]
Observations	1,271	1,271

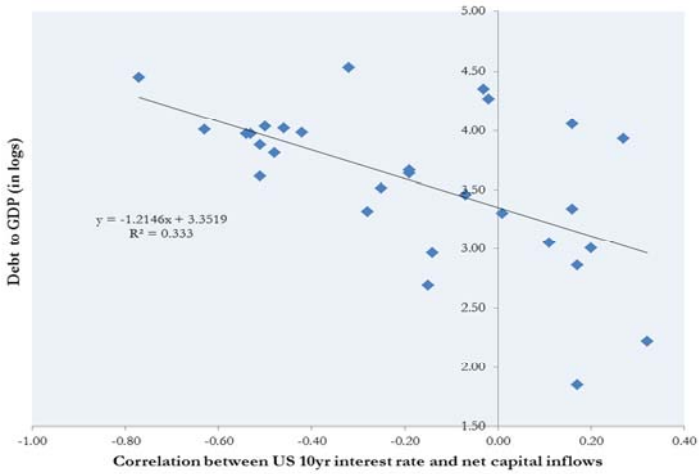
Robust clustered standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

A deeper look at domestic factors affecting the probability of sudden stops in net capital inflows

So far this section has used the same domestic factors as Forbes and Warnock (2012). In this sub-section we extend the analysis of the determinants of sudden stops in *net* inflows to include other domestic factors that could be significantly associated with sudden stops in net capital inflows. In particular, the following explanatory variables are included: 4-year averages of current account deficit and fiscal deficit, the ratio of debt to GDP, the 2-year average of annual capital outflows, the exchange rate regime and the ratio of short term debt to international reserves.

Why these new explanatory variables? First, because there is an abundant empirical literature suggesting that sudden stops in net terms are preceded by periods of large current account and/or fiscal deficits, and they are more likely to occur in countries with fixed exchange rates and relatively high short-term debt to international reserves ratio (see Calvo et al, 1996; Calvo et al., 2008 and Reinhart and Reinhart, 2009). Second, because as Figure 6 clearly shows, the correlation between net capital inflows and US long term interest rates is higher in countries with a higher ratio of debt to GDP. This can be explained by a negative feedback loop between debt and net capital flows: when net capital inflows decrease, the costs of refinancing the debt increases making default more likely; as a result, more capital leaves the country pushing the cost of refinancing even higher and creating new rounds of net capital outflows.

Figure 6. Correlation between US interest rates and Net capital inflows vs. Debt as % of GDP



Finally, the reason to include the 2-year average stock of capital outflows is better explained by the results of Table 4: episodes of stops in gross capital inflows are many times compensated by episodes of retrenchment in capital outflows; but for this to happen, the stock of capital outflows needs to be relatively high in the first place. If gross capital outflows are very low (as was the case in most EMEs in 1990s or in Turkey today, see Figure 1), then an episode of stop in gross capital inflows cannot be compensated by a retrenchment in gross outflows, and the result would be a sudden stop in net capital inflows. On the other hand, in countries like Chile where the stock of capital outflows is high relative to gross inflows, stops in gross inflows could be offset by retrenchment in gross outflows and, therefore, help avoid a sudden stop in net terms (see Figure 1).

Table 6 presents the results of including these new domestic factors (explanatory variables) in equation (3.3). The inclusion of these new explanatory variables does not affect the findings reported in Table 5 (neither the results of Table 4; whose equivalent is reported in Table A.7. in the appendix). Global factors remain generally insignificant (with the only exemption of G7 growth in columns 1 and 5). For domestic factors, the two variables whose results are very robust are financial openness and domestic growth. Stricter capital controls and lower GDP growth are significantly associated with a higher probability of sudden stops in net capital inflows. Trade openness is negative but only significant in column 4, while financial depth is significant and negative in all regressions: countries with more developed financial markets face a lower probability of sudden stops in net terms.

Regarding the new explanatory variables, the results are very remarkable. Confirming our priors, while countries with a relatively high stock of outflows face a significantly lower probability of sudden stops, countries with recently persistent high current account and/or fiscal deficits face a higher probability of sudden stops.[12]For the exchange rate regime, the coefficient changes signs across regressions, but is never significantly associated with the probability of a sudden stop. Finally, a relatively low ratio of short-term debt to international reserves also increases the probability of having episodes of sharp changes of capital flows in *net* terms.

An interesting result comes from the debt to GDP ratio. When this variable enters by itself, the coefficient is surprisingly not statistically significant. This result could be related to the fact that, across EMEs, the variability of Debt to GDP ratio is rather low. However, when the variable is interacted with

12. Average fiscal deficits are not included in all regressions because it reduces the number of observations by 30%.

global factors –such as global risk aversion- the interaction term is positive and significant.[13] This suggest that although global factors and debt to GDP per se do not have a significant effect on the probability of sudden stops, the combination of the two does affect this probability. In sum, more restrictive global financial conditions can increase the probability of sudden stops in countries with relatively high debt to GDP ratios.[14]

Table 6. Factors affecting the probability of Sudden Stops in net capital inflows

VARIABLES	(1) Sudden Stop	(2) Sudden Stop	(3) Sudden Stop	(4) Sudden Stop	(5) Sudden Stop
Global factors:					
VIX (in logs)	-0.1031	-0.0100	-1.1183	-0.0318	-0.1345
	[0.155]	[0.158]	[0.868]	[0.188]	[0.214]
U.S. 10 year interest rate	0.0832	0.0643	0.0759	0.0023	-0.0108
	[0.079]	[0.081]	[0.082]	[0.114]	[0.114]
Growth in G7 countries	-0.0576*	-0.0487	-0.0534	-0.0222	-0.2124***
	[0.033]	[0.034]	[0.034]	[0.043]	[0.048]
Domestic factors:					
Trade openness (in logs)	-0.5225	-0.3721	-0.3872	-0.8333**	-0.1411
	[0.345]	[0.369]	[0.370]	[0.423]	[0.436]
Financial depth (in logs)	-0.6345**	-0.4609*	-0.4734*	-0.6152*	-0.8190**
	[0.247]	[0.257]	[0.258]	[0.330]	[0.390]
Financial opneness (Chinn-Ito)	-0.1962***	-0.1717**	-0.1768**	-0.1817**	-0.2510**
	[0.065]	[0.071]	[0.071]	[0.083]	[0.113]
Growth of GDP	-0.0660***	-0.0529***	-0.0514***	-0.0676***	-0.0723***
	[0.017]	[0.018]	[0.018]	[0.023]	[0.024]
GDP per capita	2.7849***	2.6264***	2.6890***	2.5184***	1.8035*
	[0.705]	[0.724]	[0.725]	[0.931]	[1.044]
Aditional domestic factors:					
Stock of capital outflows	-0.0985***	-0.1096***	-0.1107***	-0.1035***	-0.0940*
(average previous 2 years)	[0.021]	[0.022]	[0.022]	[0.024]	[0.049]
Past current account deficit (%GDP)	0.0881***	0.0744***	0.0748***	0.0953***	0.1766***
(average previous 4 years)	[0.022]	[0.023]	[0.023]	[0.029]	[0.037]
Exchange rate regime	0.0210	0.0142	0.0267	-0.0705	-0.0097
	[0.082]	[0.084]	[0.084]	[0.097]	[0.139]
Det to GDP ratio (in logs)		0.0114	-0.8897		
		[0.176]	[0.556]		
VIX * Debt to GDP ratio			0.3164*		
			[0.186]		
Past fiscal deficit				0.0848**	
(average previous 4 years)				[0.041]	
Short-term debt to International					0.0043***
reserves ratio (in logs)					[0.001]
Constant	-20.3458***	-20.2090***	-17.5839***	-16.2803**	-12.3738
	[5.634]	[5.794]	[5.979]	[7.503]	[8.537]
Observations	1,171	1,151	1,151	884	642

Robust clustered standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

13. The interaction with US interest rates is not significant.

14. All the other variables have been interacted with global factors, but the interaction term (when the variables are also included by themselves) were not statistically significant and that's why the results are not shown.

5. Conclusions

The observed reversal of capital flows to emerging economies after Chairman Ben Bernanke's May 22, 2013, congressional testimony about the possibility that the Federal Reserve would begin tapering *Quantitative Easing* raised many concerns about these economies' future prospects. For instance, some analysts believe that tapering will further increase US long term interest rates and, as a result, capital flows to EMEs will collapse and create a risk of financial crisis like it happened in Latin America and Asia in 1990s. Others believe that cycles of capital flows to EMEs are not associated with US long term interest rates, but are a consequence of their own domestic policies.

To shed some light on this debate, this paper analyzed the link between cycles of capital flows to emerging economies and global factors, such as US long term interest rates. The paper found evidence that higher long term interest rates in the United States are associated with lower levels of gross capital flows to EMEs and with a higher probability of observing sharp changes of capital flows in gross terms.

The paper found evidence suggesting that gross capital inflows to EMEs follow a global cycle that is related to global risk aversion and US long term interest rates. Net capital flows, on the other hand, seem to be mostly associated with domestic factors and to a lesser extent with global factors. It is important to stress that the fact that this paper failed to find enough evidence to suggest that US long term interest rates are associated with episodes of net capital flows, does not mean that the association does not exist. Furthermore, it should not be assumed that this implies a low risk for EMEs. On the contrary, the results of this paper suggest that risks remain significant for two reasons. First, because as shown by Cavallo et al. (2013), even *Sudden Stops* in *gross* inflows that do not provoke a sharp contraction in *net* flows can also be very disruptive for EMEs, particularly those that are driven by banking flows. Second, because even if US long term interest rates may not per se trigger episodes of sharp changes in net capital flows, if they increase abruptly surprising the markets, the results could be higher global risk aversion and a sharp reversal of gross capital inflows to EMEs. If this happens, economies with relatively low levels of *gross* outflows, a high ratio of short-term debt to international reserves or with weak domestic fundamentals could face a risk of a classic sudden stop à la Calvo and the expected costs in terms of GDP lost could be significant.

BIBLIOGRAPHY

Adler G., M. L. Djigbenou, and S. Sosa, (2014), "Global Financial Shocks and Foreign Asset Repatriation: Do Local Investors Play a Stabilizing Role?", *IMF Working Paper* WP/14/60.

Aizenman, J., M. Binici, M. M. Hutchison, (2014), "The Transmission of Federal Reserve Tapering News to Emerging Financial Markets", *NBER Working Paper* No. 19980.

Bacchetta, P. and K. Benhima. (2010), "The Demand for Liquid Assets and International Capital Flows." Unpublished *mimeo*.

Blanchard, O., M. Das, and H. Faruqee. (2010), "The Initial Impact of the Crisis on Emerging Market Countries." *Brookings Papers on Economic Activity*. Spring, pp. 263-307.

Broner, F., T. Didier, A. Erce and S. L. Schmukler, (2013), "Gross capital flows: Dynamics and crises", *Journal of Monetary Economics*, Elsevier, 60(1): pp 113-133

Bruno, G. S. F. (2005), "Estimation and inference in dynamic unbalanced panel-data models with a small number of individuals". *The Stata Journal* 5, No. 4, pp. 473-500.

Calderón, C. and K. Megumi, (2013), "Sudden stops: Are global and local investors alike?", *Journal of International Economics*, Elsevier, 89(1): pp. 122-142.

Calvo, G. (1998), "Capital Flows and Capital-Market Crises: The Simple Economics of Sudden Stops", *Journal of Applied Economics* (Nov): pp. 35-54.

Calvo, G., A. Izquierdo, and M. Luis-Fernando (2008), "Systemic Sudden Stops: The Relevance of Balance-Sheet Effects and Financial Integration". *NBER Working Paper* No. 14026.

Calvo, G., L. Leiderman, and C. Reinhart (1996), "Inflows of Capital to Developing Countries in the 1990s". *Journal of Economic Perspectives* 10(2): 123-139.

Cavallo, E., A. Powell, P. Tavella and M. Pedemonte (2013), "A New Taxonomy of Sudden Stops: Which Sudden Stops should countries be most concerned about". *IDB-Working Paper* No. 430.

Chinn, M. and H. Ito. (2008), "A New Measure of Financial Openness." *Journal of Comparative Policy Analysis* 10(3): pp. 309-22.

Chuhan, P., S. Claessens, and N. Mamingi (1998), "Equity and bond flows to Latin America and Asia: the role of global and country factors". *Journal of Development Economics* 55(2): pp 439-463.

Dooley, M. (1988), "Capital flight: a response to differences in financial risks". *IMF Staff Papers,* 35: pp 422-436.

Dudley, W. C. (2010). "The Outlook, Policy Choices and Our Mandate", Remarks at the Society of American Business Editors and Writers Fall Conference, City University of New York.

Edwards S, (2007). "Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences" in: *Capital Controls and Capital Flows in Emerging, NBER Chapters*, Economies: Policies, Practices and Consequences, National Bureau of Economic Research, Inc. pp. 73-120.

Eichengreen B. and P. Gupta, (2014). "Tapering Talk: The Impact of Expectations of Reduced Federal Reserve Security Purchases on Emerging Markets", World Bank.

Faucette, J. E., A. D. Rothenberg, and F. E. Warnock (2005), "Outflows-induced Sudden Stops." *Journal of Policy Reform*,8: pp 119-130.

Fernandez-Arias, Eduardo, (1996), "The New Wave of Private Capital Inflows: Push or Pull?" *Journal of Development Economics* 48(2): pp. 389-418.

Forbes, K. J. and F. E. Warnock. (2012), "Capital flow waves: Surges, stops, flight, and retrenchment," *Journal of International Economics*, Elsevier, 88(2): pp. 235-251.

Fratzscher, M. (2012), "Capital flows, push versus pull factors and the global financial crisis", *Journal of International Economics*, Elsevier, 88(2): pp. 341-356.

Frankel, J. A. and C. A. Vegh and G. Vuletin (2013), "On graduation from fiscal procyclicality", *Journal of Development Economics*, Elsevier, 100(1): pp. 32-47.

Gagnon, J., M. Raskin, J. Remache, and B. Sack (2010), "Large-Scale Asset Purchases by the Federal Reserve: Did They Work?" *Staff Report* No. 441. Federal Reserve Bank of New York (March).

Jara A. and E. Olaberría, (2013). "Are all Capital Inflows Associated with Booms in House Prices? An Empirical Evaluation", *Working Papers Central Bank of Chile,* No. 696, Central Bank of Chile.

IMF, (2014), "Chapter 4: On the receiving end? External conditions and emerging market growth before, during and after the global financial crisis", *World Economic Outlook*, April 2014.

Krishnamurthy, A., and A. Vissing-Jorgensen (2010), "The Aggregate Demand for Treasury Debt". *Working paper*, Northwestern University.

Milesi-Ferretti, G. M. and C. Tille (2010), "The Great Retrenchment: International Capital Flows during the Global Financial Crisis". *Mimeo*.

Mishra, P., K. Moriyama, P. N'Diaye, and L. Nguyen (2014), "Impact of Fed Tapering Announcements on Emerging Markets", *IMF Working paper*,WP/14/109.

Nguyen, Ha & Qian, Rong, (2013). "Demand collapse, not credit crunch, was hurting Eastern European firms the most in the crisis", http://blogs.worldbank.org/allaboutfinance

Ollivaud, P., E. Rusticelli and C. Schwellnus (2014), "Would a Growth Slowdown in Emerging Markets Spill Over to High-income Countries?: A Quantitative Assessment", *OECD Economics Department Working Paper,* No 1110.

Powell, A.(2014) "La recuperación global y la normalización monetaria ¿cómo evitar una crónica anunciada?", IADB Informe macroeconómico de América Latina y el Caribe de 2014.

Rawdanowicz, Ł., R. Bouis, J. Brezillon, A. K. Christensen, K-I. Inaba and E. Rusticelli, (2014). "Spillover Effects from Exiting Highly Expansionary Monetary Policies", *OECD Economics Department Working Paper,* No. 1116.

Reinhart, C. and V. Reinhart (2009), "Capital Flow Bonanzas: An Encompassing View of the Past and Present," in Jeffrey Frankel and Francesco Giavazzi, eds. *NBER International Seminar in Macroeconomics 2008*. Chicago: Chicago University Press.

Rey, H. (2013), "Dilemma not Trilemma: The global financial cycle and monetary policy independence". Paper presented at the 25th Jackson Hole symposium, Wyoming, August 2013.

Swanson, E. (2011) "Let's Twist Again: A High-Frequency Event-Study Analysis of Operation Twist and Its Implications for QE2". BPEA (Spring): pp. 151–88.

World Bank (2014), "Capital flows and risks in developing countries", Global Economic Prospects, January 2014.

ANNEX

Table A.1. Data construction and definition

Variable	Definition	Source
Gross Capital Inflows	Changes in the country's liabilities with the rest of the world (investment by foreign residents in domestic assets as % of GDP)	Balance of Payments Statistics (IMF)
Gross Capital Outflows	Changes in investment by domestic residents in assets of foreign countries (as % of GDP).	Balance of Payments Statistics (IMF)
Net Capital Inflows	Gross Capital Inflows - Gross Capital Outflows (% of GDP)	Balance of Payments Statistics (IMF)
Surge	0-1 variable indicating if there is an episode when annual gross inflows increase at least two standard deviations above its 5-year rolling mean. The episode starts when annual gross inflows are more than one standard deviation above its rolling mean and ends once annual inflows falls one standard deviation below its rolling mean	Forbes and Warnock (2012)
Stop	0-1 variable indicating if there is an episode when annual gross inflows decrease at least two standard deviations below its 5-year rolling mean. The episode starts when annual gross inflows are more than one standard deviation below its rolling mean and ends once annual inflows increase one standard deviation above its rolling mean .	Forbes and Warnock (2012)
Flight	0-1 variable indicating if there is an episode when annual outflows increase at least two standard deviations above its 5-year rolling mean. The episode starts when annual outflows are more than one standard deviation above its rolling mean and ends once annual outflows falls one standard deviation below its rolling mean .	Forbes and Warnock (2012)
Retrenchment	0-1 variable indicating if there is an episode when annual outflows decrease at least two standard deviations below its 5-year rolling mean. The episode starts when annual outflows are more than one standard deviation below its rolling mean and ends once annual outflows increase one standard deviation above its rolling mean .	Forbes and Warnock (2012)
Sudden surge in net inflows	0-1 variable indicating if there is an episode when annual NET inflows increase at least two standard deviations above its 5-year rolling mean. The episode starts when annual NET inflows are more than one standard deviation above its rolling mean and ends once annual inflows falls one standard deviation below its rolling mean .	Forbes and Warnock (2012)
Sudden stop in net inflows	0-1 variable indicating if there is an episode when annual NET inflows decrease at least two standard deviations below its 5-year rolling mean. The episode starts when annual NET inflows are more than one standard deviation below its rolling mean and ends once annual inflows increase one standard deviation above its rolling mean .	Forbes and Warnock (2012)
U.S. 10 year interest rate	Interest rate on U.S. 10 year treasury bonds (average of the period)	Datastream
VIX	Volatility Index (VXO) calculated by the Chicago Board Options Exchange (average of the period)	Datastream
Growth G7 GDP	Rate of growth over the previous period	OECD Statistics
GDP Growth	Rate of growth over the previous period	International Financial Statistics (IMF)
Institutional Quality	Institutional Quality	World Bank
Domestic interest rate	Deposits interest rate (average of the period)	International Financial Statistics (IMF)
Average current account deficit	Current account deficit (% of GDP) average previous 4 years	WEO (IMF)
Average fiscal deficit	Fiscal deficit (% of GDP) average previous 4 years	WEO (IMF)
Trade openness	Exports plus imports over GDP	World Development Indicators
Reserves to GDP	Net international reserves over GDP	World Development Indicators
Financial Depth	Domestic Credit provided by the private sector as percent of GDP	World Development Indicators
Short term debt to International Reserves	Short term debt to International Reserves	World Development Indicators
Debt to GDP ratio	Total external debt as percentage of GDP	Abbas et al. (2013)
GDP per capita	GDP per capita in US$ (1995)	World Development Indicators

Table A.2. Sample of countries and summary statistics per country

	Gross outflows (% GDP)	Gross inflows (% GDP)	Net inflows (%GDP)	Surges episodes	Stops episodes	Flight Episodes	Retrench episodes	Start episode (net terms)	Stops episode (net terms)	Trade opennes (in logs)	Financial Depth (in logs)	Financial Opnennes	Average stock of gross outflows	Average past current account	GDP growth	GDP per capita	Exchange rate regime	Short-term debt to Reserves ratio
Latin america:																		
(1) Argentina	-0.70	0.62	-0.08	0.15	0.28	0.23	0.13	0.13	0.31	3.32	2.80	0.10	2.82	0.12	3.20	8.36	2.00	2.02
(2) Brazil	-0.33	0.86	0.53	0.20	0.16	0.14	0.16	0.23	0.16	3.06	3.80	-0.82	1.24	1.24	2.18	8.43	3.76	1.85
(3) Chile	-1.79	2.46	0.67	0.15	0.17	0.28	0.19	0.11	0.23	4.14	4.17	0.21	7.06	0.95	3.76	8.80	3.52	
(4) Colombia	-0.54	1.30	0.76	0.12	0.12	0.06	0.18	0.24	0.12	3.56	3.49	-0.82	2.12	1.75	2.33	8.11	3.29	1.60
(5) Costa Rica	-0.17	1.46	1.29							4.48	3.19	0.62	0.61	4.60	3.36	8.35	2.71	1.81
(6) Mexico	-0.27	1.13	0.92	0.13	0.11	0.15	0.15	0.18	0.16	3.86	3.00	0.82	0.89	2.27	2.08	8.92	3.81	2.00
(7) Peru	-0.22	1.30	1.08	0.13	0.23	0.25	0.11	0.15	0.40	3.58	2.96	1.85	0.82	3.15	3.18	7.90	3.57	1.74
(8) Venezuela	-1.75	0.61	-1.14	0.22	0.07	0.12	0.24	0.37	0.07	3.92	2.79	-0.11	6.76	-6.17		8.63	2.52	1.63
Emerging Europe:																		
(9) Croatia	-0.35	2.42	2.07	0.11	0.16	0.22	0.18	0.16	0.24	4.51	3.80	0.58	1.36	4.82	2.77	9.12	3.00	
(10) Czech Republic	-0.98	2.54	1.55	0.07	0.24	0.16	0.27	0.22	0.24	4.71	3.89	1.56	3.70	3.88	2.29	9.32	2.91	
(11) Estonia	-2.26	4.02	1.75	0.22	0.24	0.20	0.20	0.14	0.16	5.00	3.95	2.39	8.46	8.17	3.35	9.06	1.00	
(12) Hungary	-1.67	3.31	1.64	0.24	0.10	0.26	0.03	0.17	0.26	4.75	3.67		6.84	5.86	1.91	9.13	1.57	1.78
(13) Latvia	-1.73	4.10	2.31	0.38	0.25	0.13	0.22	0.23	0.03	4.60	3.53	2.31	6.80	7.16	0.54	8.57	1.68	
(14) Lithuania	-0.73	2.28	1.71	0.24	0.20	0.11	0.19	0.22	0.11	4.65	3.26	2.26	3.03	8.02	2.91	8.73	1.32	
(15) Poland	-0.44	1.22	0.79	0.30	0.22	0.11	0.24	0.32	0.11	4.09	3.34	-0.67	1.70	2.85	3.24	8.83	3.48	
(16) Romania	-0.11	1.84	1.73	0.36	0.15	0.17	0.06	0.25	0.17	4.18	2.93	0.06	0.43	6.28	2.54	8.31	3.00	
(17) Russia	-1.58	0.91	-0.67	0.22	0.15	0.32	0.15	0.15	0.20	4.02	3.06	-0.32	6.37		3.18	8.47		
(18) Slovak Republic	-0.58	1.95	1.37	0.09	0.20	0.13	0.09	0.13	0.29	4.93	3.75	-0.06	2.23	5.72	3.49	9.21	2.91	
(19) Slovenia	-1.22	1.87	0.60	0.18	0.27	0.24	0.14	0.06	0.20	4.76	3.78	1.16	5.02	0.98	2.69	9.63	2.11	
(20) Turkey	-0.24	1.02	0.73	0.16	0.23	0.13	0.14	0.19	0.24	3.79	3.11	-0.66	0.99	2.15	3.04	8.75	3.52	2.00
Asia:																		
(21) Hong Kong	-10.53	8.67	-1.85	0.00	0.24	0.00	0.24	0.00	0.00	5.73	5.03	2.44	43.20	-5.23	2.94	10.08	1.76	
(22) India	-0.20	0.85	0.78	0.29	0.18	0.24	0.20	0.39	0.28	3.36	3.45	-1.17	0.81	0.80	5.33	6.44	3.33	1.31
(23) Indonesia	-0.25	0.36	0.07	0.15	0.14	0.23	0.14	0.19	0.25	4.05	3.51	1.51	1.05	-0.84	2.66	7.09	3.19	1.95
(24) Korea	-0.70	0.91	0.21	0.08	0.15	0.29	0.23	0.08	0.20	4.26	4.51	-0.19	2.71	-1.57	4.05	9.60	3.67	
(25) Malaysia	-2.39	0.86	-1.53	0.00	0.38	0.33	0.19	0.00	0.43	5.23	4.74		8.49	-5.88	4.60	8.50	2.19	1.41
(26) Philippines	-0.35	1.21	0.86	0.16	0.16	0.19	0.10	0.13	0.19	4.45	3.45	-0.11	1.34	0.56	3.34	7.03	3.95	1.71
(27) Thailand	-0.54	1.09	0.50	0.18	0.26	0.15	0.20	0.18	0.21	4.71	4.75	-0.30	2.11	-0.67	2.76	7.78	2.52	1.77
Africa and other:																		
(28) Egypt	0.07	-0.34	-0.27							3.93	3.64	0.97	-0.14	-1.18		7.05	2.71	1.21
(29) Israel	-1.35	1.43	0.08	0.14	0.18	0.14	0.25	0.21	0.11	4.29	4.34	0.87	5.41	0.55	3.24	9.82	3.10	
(30) South Africa	-0.61	1.19	0.58	0.18	0.21	0.31	0.06	0.05	0.34	3.94	4.86	-1.15	2.59	1.63	1.87	8.52	4.00	2.14

Table A.3. Matrix of pair-wise correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(1) Gross outflows (% GDP)	1.00																					
(2) Gross inflows (% GDP)	-0.76	1.00																				
(3) Net inflows (%GDP)	0.18	0.50	1.00																			
(4) Surges episodes	-0.09	0.19	0.19	1.00																		
(5) Stops episodes	0.09	-0.17	-0.17	-0.22	1.00																	
(6) Flight Episodes	-0.11	0.11	0.01	0.23	-0.12	1.00																
(7) Retrenchemnt episodes	0.11	-0.10	0.00	-0.15	0.36	-0.21	1.00															
(8) Institutional rating	0.01	0.03	0.05	0.16	0.02	0.14	0.03	1.00														
(9) Start episode (net terms)	0.06	0.04	0.17	0.52	-0.22	-0.23	0.35	0.13	1.00													
(10) Stops episode (net terms)	0.01	-0.08	-0.12	-0.24	0.42	0.51	-0.23	0.08	-0.24	1.00												
(11) VIX (in logs)	0.07	-0.10	-0.06	-0.18	0.26	-0.17	0.21	-0.31	-0.07	0.01	1.00											
(12) U.S. 10 year interest rate	0.08	-0.06	0.02	0.05	-0.14	0.03	-0.11	0.48	0.08	0.02	-0.28	1.00										
(13) Grosth of G7 countries	-0.04	0.05	0.03	0.15	-0.37	0.07	-0.30	-0.15	0.06	-0.09	-0.35	0.38	1.00									
(14) Trade openness (in logs)	-0.29	0.31	0.07	-0.01	0.05	-0.02	0.01	-0.07	-0.08	-0.05	0.03	-0.15	-0.02	1.00								
(15) Financial Depth (in logs)	-0.17	0.17	0.02	-0.02	0.12	0.02	0.11	0.00	-0.05	0.01	0.06	-0.23	-0.12	0.47	1.00							
(16) Financial Opnenness	-0.17	0.24	0.13	0.02	0.03	-0.04	0.03	-0.16	-0.05	-0.08	0.05	-0.31	-0.10	0.45	0.14	1.00						
(17) Average stock of gross outflows	-0.48	0.38	-0.09	-0.01	0.05	-0.04	0.10	0.05	-0.04	-0.10	0.05	-0.13	-0.13	0.40	0.25	0.24	1.00					
(18) Average past current account	0.15	0.16	0.48	0.06	0.07	-0.02	-0.01	-0.02	0.01	0.03	0.05	0.06	-0.03	0.02	-0.06	0.17	-0.20	1.00				
(19) GDP growth	-0.08	0.20	0.22	0.22	-0.34	0.09	-0.19	0.03	0.15	-0.13	-0.21	0.07	0.29	0.03	-0.01	0.01	0.01	-0.04	1.00			
(20) GDP per capita	-0.22	0.20	0.00	-0.05	0.03	-0.02	0.05	-0.06	-0.08	-0.06	0.04	-0.19	-0.07	0.48	0.32	0.30	0.30	0.04	-0.01	1.00		
(21) Exchange rate regime	0.16	-0.23	-0.14	-0.09	-0.02	-0.02	-0.03	0.02	-0.05	0.02	-0.03	0.12	0.05	-0.38	-0.15	-0.37	-0.23	-0.14	-0.08	-0.05	1.00	
(22) Short-term debt to Reserves ratio	0.02	-0.02	0.00	0.01	0.01	0.03	-0.04	0.23	0.00	0.05	-0.14	0.36	0.08	-0.06	0.03	0.06	-0.02	0.16	-0.14	0.10	0.00	1.00

Table A.4.-Robustness checks 1: Determinants of capital flows (as % of GDP) using different methodologies

Dependent variable: capital flows as % of GDP. All regressions include country fixed effects.									
Methodology:	Bruno (2005)			OLS without lagged dependent variable			Arellano and Bond System GMM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Gross	Gross	Net	Gross	Gross	Net	Gross	Gross	Net
VARIABLES	Inflows	Outflows	Inflows	Inflows	Outflows	Inflows	Inflows	Outflows	Inflows
Lagged dependent variable	0.8359***	0.8580***	0.8573***				0.981***	1.087***	1.047***
	[0.021]	[0.021]	[0.021]				[0.011]	[0.007]	[0.039]
Global Factors:									
U.S. 10 yrs interest rate	-0.1230	-0.1126	0.0240	-0.2295	-0.5327*	0.4025	-0.237***	0.003	-0.058
	[0.151]	[0.106]	[0.077]	[0.250]	[0.230]	[0.270]	[0.084]	[0.059]	[0.048]
VIX (in logs)	-1.3326*	-1.0248*	-0.2786	0.1109	-1.0122*	1.1569	-1.856***	-1.034***	-0.344
	[0.699]	[0.534]	[0.373]	[0.854]	[0.600]	[0.730]	[0.384]	[0.201]	[0.298]
Growth G7 countries	0.1860	0.1518	0.0681	0.6722	0.5047	0.1786	-0.020	0.030	-0.002
	[0.170]	[0.141]	[0.098]	[0.454]	[0.486]	[0.242]	[0.092]	[0.071]	[0.091]
Domestic Factors:									
GDP growth	0.1642**	0.0089	0.1275***	0.6301***	0.0328	0.5950***	0.088***	0.002	0.056**
	[0.077]	[0.062]	[0.043]	[0.114]	[0.065]	[0.103]	[0.027]	[0.022]	[0.023]
Institutional Quality	1.6050	0.8448	0.4839	12.6485***	5.3524***	7.4520***	-1.268	-0.568	-1.438
	[1.492]	[1.164]	[0.801]	[2.607]	[1.430]	[2.435]	[1.093]	[1.289]	[0.991]
Domestic interest rate	0.0158	0.0213	-0.0356	0.0635	0.0337	0.0305	0.018	0.025	-0.051***
	[0.048]	[0.032]	[0.023]	[0.069]	[0.026]	[0.063]	[0.013]	[0.019]	[0.013]
Constant				47.5061***	26.9824***	20.8979***	2.025	0.786	-3.599
				[8.093]	[5.090]	[7.705]	[3.239]	[3.993]	[2.822]
Observations	1,444	1,412	1,412	1,444	1,412	1,412	1,444	1,412	1,412
Number of countries	30	30	30	30	30	30	30	30	30
AR(1)							0.009	0.033	0.000
AR(2)							0.668	0.851	0.925
Hansen							0.901	0.856	0.922

Robust clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table A.5.-Robustness checks 2: Determinants of capital flows (as % of GDP) using annual data and different methodologies

Dependent variable: capital flows as % of GDP. All regressions include country fixed effects.												
Methodology:	Simple OLS with Lagged			Bruno (2005)			Simple OLS without Lagged			Arellano and Bond System GMM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Gross	Gross	Net	Gross	Gross	Net	Gross	Gross	Net	Gross	Gross	Net
VARIABLES	Inflows	Outflows	Inflows	Inflows	Outflows	Inflows	Inflows	Outflows	Inflows	Inflows	Outflows	Inflows
Lagged dependent variable	0.4629***	0.5422***	0.5943***	0.4009***	0.3880***	0.4674***				0.362***	0.403***	0.556***
	[0.076]	[0.028]	[0.061]	[0.045]	[0.047]	[0.042]				[0.014]	[0.013]	[0.011]
Global Factors:												
U.S. 10 yrs interest rate	-1.7135**	-2.3127***	0.8239	-1.2059	-3.2202**	1.6661	-1.1571	-2.2934***	0.8974	-1.259***	0.016	-0.993
	[0.670]	[0.679]	[0.567]	[1.436]	[1.273]	[0.998]	[1.077]	[0.935]	[0.580]	[0.403]	[0.367]	[0.537]
VIX (in logs)	-3.8460***	-3.2793***	-0.5740	-3.8146***	-3.4833**	-0.0790	-3.7131**	-3.6941**	-0.2349	-3.651***	-2.938***	-0.517
	[1.173]	[1.218]	[0.657]	[1.142]	[1.664]	[1.078]	[1.488]	[1.519]	[0.960]	[0.306]	[0.264]	[0.305]
Growth G7 countries	0.1560	0.3826**	-0.0720	-0.0323	0.3075	-0.2470	-0.4971**	0.0895	-0.6266***	0.101***	0.212***	0.154***
	[0.158]	[0.175]	[0.142]	[0.277]	[0.255]	[0.215]	[0.223]	[0.222]	[0.217]	[0.030]	[0.041]	[0.049]
Domestic Factors:												
GDP growth	0.4611***	0.0901	0.3368***	0.5445***	0.1310	0.4024***	0.6743***	0.1772*	0.5082***	0.359***	0.081**	0.064*
	[0.111]	[0.070]	[0.074]	[0.101]	[0.103]	[0.063]	[0.129]	[0.096]	[0.101]	[0.033]	[0.036]	[0.034]
Institutional Quality	3.3134**	1.7831	0.7424	3.9308**	0.1037	3.5647**	6.7670***	2.6171	4.1316***	-0.436	-6.386***	-2.627***
	[1.348]	[1.252]	[0.518]	[1.850]	[1.876]	[1.400]	[1.782]	[2.361]	[1.326]	[1.974]	[0.860]	[0.579]
Domestic interest rate	-0.0494**	-0.0138	-0.0304	-0.0595*	-0.0032	-0.0568**	-0.0729***	-0.0237	-0.0604**	-0.121***	-0.052**	-0.097***
	[0.021]	[0.020]	[0.024]	[0.033]	[0.042]	[0.023]	[0.028]	[0.018]	[0.029]	[0.016]	[0.022]	[0.010]
Constant	15.1364***	13.7166***	0.5443				16.6714***	19.0504***	-2.0695	16.933***	11.955***	4.939***
	[3.888]	[3.973]	[2.206]				[4.745]	[5.362]	[3.197]	[1.093]	[1.534]	[0.797]
Observations	587	561	557	587	561	557	587	565	565	587	561	557
Number of countries	30	30	30	30	30	30	30	30	30	30	30	30
AR(1)										0.074	0.011	0.000
AR(2)										0.165	0.224	0.772
Hansen										0.218	0.429	0.431

Robust clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table A.6. Determinants of episodes of large capital flows reversals (Annual data)

Dependent variable: Episodes of large capital flows reversals. **Methodology:** Probit						
	Gross Terms				**Net Terms**	
	(1)	(2)	(3)	(4)	(5)	(6)
	Surges	Stops	Flight	Retrenchment	Sudden Surge	Sudden Stop
Global Factors:						
U.S. 10yrs interest rate	0.4221	0.8109	-0.2991	0.9376	0.5857	-0.1055
	[0.678]	[0.716]	[0.661]	[0.708]	[0.661]	[0.666]
VIX	-0.6587**	0.5303*	-1.1319***	1.0950***	-0.0380	-0.5147
	[0.296]	[0.312]	[0.294]	[0.315]	[0.285]	[0.287]
Growth G7 countries	0.0682	-0.2370***	-0.0161	-0.1360**	-0.0423	-0.0684
	[0.080]	[0.078]	[0.071]	[0.067]	[0.066]	[0.065]
Domestic Factors:						
Trade openness	-0.0898	-0.2449	-1.0549**	-0.1634	-0.4650	-1.3367***
	[0.565]	[0.577]	[0.515]	[0.523]	[0.524]	[0.507]
Financial Depth	0.1670	0.3854	-0.5303	0.8186***	0.5721*	-0.2062
	[0.327]	[0.305]	[0.327]	[0.309]	[0.301]	[0.296]
Financial Openness	-0.0194	0.0864	-0.0753	-0.0724	-0.1339	-0.1209
	[0.098]	[0.101]	[0.098]	[0.096]	[0.091]	[0.095]
GDP growth	0.1022***	-0.1302***	0.0221	-0.0063	0.0843***	-0.0887***
	[0.027]	[0.027]	[0.023]	[0.021]	[0.023]	[0.021]
GDP per capita	1.0995	0.9574	1.5260*	0.6721	0.6110	1.4501*
	[0.911]	[0.902]	[0.890]	[0.890]	[0.866]	[0.864]
Constant	-9.6249	-10.3346	-4.4800	-12.6714	-6.7635	-4.5726
	[7.709]	[7.853]	[7.529]	[7.773]	[7.422]	[7.422]
Observations	370	378	367	373	375	372

Robust clustered standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table A.7. Additional determinants of Surge, Stop, Flight and Retrenchment episodes in *Gross* flows

	(1) Surges	(2) Stops	(3) Flight	(4) Retrenchment
Global factors:				
VIX (in logs)	-0.4993***	0.6458***	-0.8701***	0.5957***
	[0.169]	[0.168]	[0.164]	[0.164]
U.S. 10 year interest rate	-0.1089	0.1123**	-0.0342	0.1909**
	[0.084]	[0.058]	[0.078]	[0.088]
Growth in G7 countries	0.1942***	-0.2369***	0.0553	-0.1630***
	[0.056]	[0.037]	[0.040]	[0.035]
Domestic factors:				
Trade openness (in logs)	-0.0999	0.3957	-0.9113**	0.0453
	[0.420]	[0.375]	[0.370]	[0.361]
Financial depth (in logs)	0.0441	-0.4845*	-0.6677**	0.7120***
	[0.311]	[0.256]	[0.283]	[0.256]
Financial opneness (Chinn-Ito)	0.1571*	0.0307	-0.1078	-0.0447
	[0.084]	[0.071]	[0.070]	[0.071]
Growth of GDP	0.1229***	-0.0998***	0.0050	-0.0342*
	[0.028]	[0.018]	[0.020]	[0.018]
GDP per capita	0.5309	0.3959	2.5567***	-0.7712
	[0.803]	[0.715]	[0.752]	[0.719]
Aditional domestic factors:				
Stock of capital outflows	0.0030	0.0292***	-0.0400**	0.0474***
(average previous 2 years)	[0.018]	[0.011]	[0.018]	[0.011]
Past current account deficit (%GDP)	-0.0393*	0.1223***	0.0170	-0.0104
(average previous 4 years)	[0.023]	[0.022]	[0.023]	[0.021]
Exchange rate regime	-0.0402	0.1104	-0.0586	0.1606*
	[0.101]	[0.083]	[0.093]	[0.087]
Constant	-4.5090	-6.2571	-15.0491**	0.8163
	[6.205]	[5.843]	[5.919]	[5.790]
Observations	1,168	1,192	1,161	1,182

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

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