

INTERNATIONAL RESERVES AND GROSS CAPITAL FLOWS DYNAMICS¹

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ABSTRACT

This paper explores the role of international reserves as a stabilizer of international capital flows, in particular during periods of global financial stress. In contrast with previous contributions, aimed at explaining net capital flows, we focus on the behavior of gross capital flows. We analyze an extensive cross-country quarterly database -63 countries, 1991-2010- using standard panel regressions. We document significant heterogeneity in the response of resident investors to financial stress and relate it to a previously undocumented channel through which reserves act as a buffer during financial stress. A robust result of the analysis is that international reserves facilitate financial disinvestment overseas by residents –a fall in capital outflows-. This partially offsets the drop in foreign capital inflows in such periods, which are only marginally mitigated by reserves under some specifications of the model. For the whole period, we also find that larger stocks of reserves are linked to higher gross inflows and lower gross outflows.

KEYWORDS: Gross capital flows, international reserves, systemic crises, capital retrenchment

JEL CODES: F21, F32, F33

1. Introduction

The world economy has, in recent decades, experienced a process of global financial integration, with large increases in cross-border capital flows in both emerging and developed economies. The process has been far from smooth. As shown in Graph 1, where episodes of global financial stress (as defined in section 2) are depicted with a green shadowed area, cross-border capital flows have been increasing, grinding abruptly to a halt during the 1995-1996, 1998-1999 and 2001-2002 episodes of turmoil. Each time, they resumed soon afterwards, reaching their peak at the onset of the 2008 global economic crisis. After their sharp collapse, financial flows are recovering

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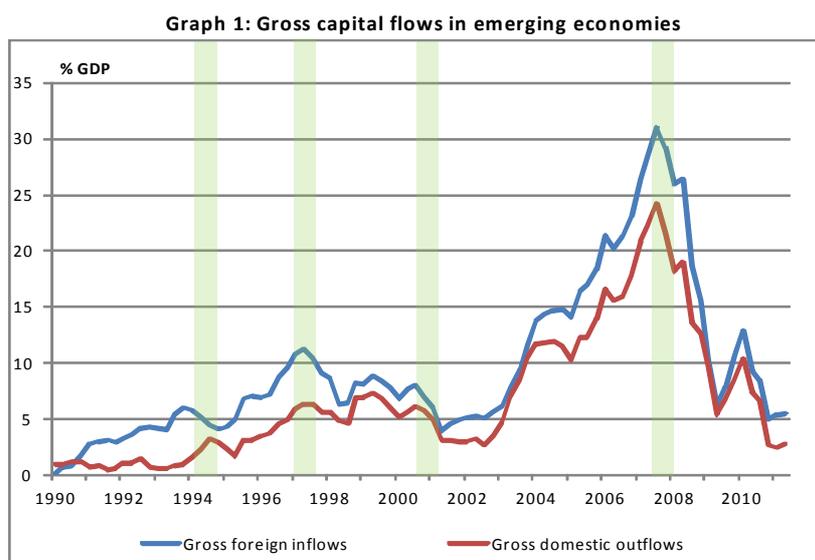
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again. The picture is one of waves of increasing integration followed by episodes of sudden reductions in cross-border flows.⁵

While countries, in particular emerging economies, can benefit from foreign savings, they can also be severely affected by episodes of disruption in cross-border capital flows. In fact, strong capital inflows can lead to exchange rate misalignments, foster credit booms and currency mismatches and are subject to sudden stops, namely sharp reductions in cross-border flows. These can, in turn, trigger strong exchange rate depreciations, banking crises (Jeanne, 2010) and have long-lasting effects on GDP growth.⁶



Note: Average of gross capital flows, as % of GDP, for emerging economies -as classified in the Appendix. "Gross foreign inflows" are investments by foreigners "Gross domestic outflows" are investments overseas by residents. Quarters of financial stress are dashed (1Q95, 3Q98, 4Q01, 4Q08).

Against this background, the challenge for policy makers lies in reaping the benefits of financial integration while managing these risks. Episodes of high capital flows to emerging economies have been managed with different tools. Macro-prudential policies and capital controls have sometimes been used during the upswing to prevent credit booms and financial instability. Even more often, in particular in the past decade, foreign reserve accumulation by Central Banks has been used to prevent excessive exchange rate misalignments and build up buffers against eventual sudden stops (Ostry et al., 2011).⁷ Graph 1 presents simple country averages of the dynamic behavior of gross capital flows.

⁵ A similar picture emerges from Broner et al. (2013) and Forbes and Warnock (2012).

⁶ Bordo et al (2010) use early 20th century data to show that sudden stops can have lasting effects on GDP growth.

⁷ Durdu et al. (2009) presents a general equilibrium model of reserve accumulation. It rationalizes the buildup of large stocks of foreign reserves as a precautionary behavior in an environment where credit constraints can lead to sudden capital stops. Caballero and Panageas (2008) compare self-insurance with active liability management and show that the later can provide significant gains to the country.

Indeed, after the recent crisis, international reserve holdings have skyrocketed again in emerging economies. They exceeded 10 trillion dollars in 2011, well above the 7.5 trillion dollars at the onset of the crisis. Emerging economies' international reserves have climbed from 5 trillion dollars before the crisis to close to 6 trillion dollars. According to Jeanne and Ranciere (2009), leaving aside China, reserve accumulation in emerging economies might largely be explained by precautionary motives, the threat of a reversal on capital inflows.

There is a growing consensus among policy makers that holding large stocks of foreign reserves pays off.⁸ However, hard evidence supporting that view is scant and there is mounting evidence that this policy might impose significant externalities and have major costs for the world economy (IMF, 2010). With this paper we aim to provide additional elements to evaluate the effects of reserve accumulation. We do so by assessing the effect of international reserve holdings by Central Banks on the behavior of cross-border investors, either foreign or domestic, through the analysis of gross capital inflows and outflows during periods of systemic financial stress.⁹ Our approach goes beyond most of the empirical literature on the issue, which has focused mostly on the impact of reserves on either foreign flows or net capital flows.¹⁰ By placing our focus also on resident investors, we follow a recent strand of literature that has suggested that international reserves are held at least partly to prevent and mitigate domestic capital flight. Along these lines, Obstfeld et al. (2008) show that international reserves depend on the economy's monetary aggregate (M2), which, they argue, can be seen as a proxy of the resources that residents can invest overseas.¹¹

The literature using net flows has found contradictory evidence regarding the ability of international reserves to lower substantially the probability of experiencing sudden stops. According to Calvo (2007), sudden stops of capitals are best prevented by orthodox domestic policies and limited balance-sheet vulnerabilities, with international reserves playing an indirect role. Edwards (2007) argues that international reserves play a minor role in avoiding sudden stops. Calvo et al. (2008) suggest that international reserve holdings could both prevent a sudden stop by mitigating exchange rate depreciation and act as a buffer in the event of experiencing such a stop. Along the same lines, IMF (2006) emphasizes that international reserves are a relevant tool for self-insuring against external shocks. In contrast, García and Soto (2004) find a strong negative relationship between the level of international reserves and the probability of sudden stops.

Using net flows can, however, be misleading. Consider a sudden stop episode – a sharp reduction in net financial flows- and the consequent increase in financing needs. Does it reflect a reduction in

⁸ IMF (2011) analyzes the level of reserves worldwide using a variety of reserve adequacy indicators. According to their preferred metric most countries hold an excessive amount of foreign reserves.

⁹ A related strand of the literature, instead of focusing on the benefits of reserve accumulation, studies its determinants. For instance, Bastourre et al (2009), using GMM techniques in a panel of emerging countries, find a U-shaped relationship between reserves and development level. They also find that countries with flexible exchange rate regimes have higher ratios of reserves to GDP. Chinn and Ito (2006) present evidence on the absence of a significant relation between international reserves and an economy's degree of financial openness. Broto et al. (2006) shows that a larger stock of reserves reduces the volatility of FDI net flows.

¹⁰ For instance, Obstfeld (2011) argues that international reserves are held to prevent foreign capital flight and, thus, relate to the countries' international liabilities.

¹¹ Jeanne and Rancière (2009) suggest that considering the level of M2 helps rationalize high levels of foreign reserves

overseas investment or an increase in investment overseas by residents? Along these lines, a few recent papers show that the underlying drivers of net financial flows are better understood if the data is divided into gross foreign inflows (i.e. financial investment in the country by non-residents) and gross domestic outflows (i.e. financial investment abroad by residents). Rothenberg and Warnock (2011) show that many sudden stop episodes were indeed episodes of resident capital flight and that only a fraction were driven by a contraction of gross foreign inflows. In turn, Forbes and Warnock (2012) show that global factors are important determinants of both resident and foreign sudden stop episodes and that, although domestic macroeconomic characteristics hardly matter, changes in domestic economic growth influence episodes of foreign capital flight. Also closely related to our paper, Broner et al. (2013) and Cowan et al. (2007) argue that a key difference between developed and emerging economies during financial stress lies in the behavior of gross domestic outflows. According to Broner et al. (2013), who study the behavior of gross flows along the business cycle, during crises, foreign investors flee while domestic investors tend to retrench.¹²

We follow this “gross approach” to study the impact of international reserve accumulation on the behavior of gross capital flows, focusing on periods of global stress, and taking into account both the occurrence of the stress and its intensity. We build an extensive quarterly database on gross capital flows in which we distinguish the behavior of foreign investors in the economy from that of the economy’s resident investors abroad. By looking separately at the domestic and foreign components of capital flows we address the following questions. Do international reserves play a catalytic role vis-à-vis foreign investors? Do they affect the behavior of gross domestic outflows? In light of the literature we perform the analysis measuring reserves in terms of both international financial liabilities, to proxy for the resources that non-residents can pull out of the country) and, a narrow monetary aggregate (M2), to proxy for the resources which residents can pull out of the country.

Our main results suggest that the behavior of gross domestic outflows during periods of financial stress is significantly influenced by the level of international reserves, while the evidence for the behavior of gross foreign inflows is less clear. During periods of stress, countries with more international reserves experience larger drops in gross domestic outflows. International reserves make residents more willing to invest savings domestically and repatriate capitals invested overseas, mitigating the lack of foreign financing. Capital inflows, on the contrary, drop during the periods of stress, albeit under certain specifications, the reduction is mitigated by larger holding of reserves. The empirical analysis also uncovers that the stock of reserves also matters outside these periods: gross inflows are larger and gross outflows lower the higher the stock of reserves. This implies, *ceteris paribus*, that net flows are larger, too.

¹² Broner et al. (2013) further show that the various capital flow components respond to crises very differently.

These findings are relevant for at least two reasons. First, by highlighting a previously undocumented benefits of holding reserves- the buffering impact of reserves in times of financial stress-; they contribute to improve the design of the international financial architecture. The stabilizing effect of reserves on the behavior of resident investors underscores the existence of potential complementarities between the local Central Bank and domestic investors¹³ and it should be an element to take into account in the design of any financial safety net aimed at limiting countries' incentives to accumulate reserves. As such, the exercise also provides new insights to the growing literature on the dynamic behavior of gross capital flows documented above. In particular, the robust link we find between the level of reserves and the behavior of domestic outflows in periods of financial stress reconciles the reduction of external exposure of domestic investors in such episodes, showed by Broner et al. (2013) and the recurrent phenomenon of domestic capital flight documented by Rothenberg and Warnock (2011) and Forbes and Warnock (2012).¹⁴

The rest of the paper is structured as follows. Section 2 describes the data. Section 3 provides preliminary evidence on the link between behavior of flows and the level of reserves during previous of financial stress. Section 4 presents the econometric exercise along with our main results and a battery of robustness checks. Finally, section 4 concludes.

2. Data

We construct a database comprising 63 countries for the period 1991-2010. Countries were selected according to data availability, and constrained by our interest in using quarterly data.¹⁵ Given that some relevant developments may last few quarters or that their impact is felt in quarters of different years we use quarterly data. Our final sample, detailed in Annex I, contains 44 emerging economies and 19 developed countries.¹⁶

Data on financial flows, as reported in Balance of Payment data, comes from the *International Financial Statistics* of the *International Monetary Fund*. This source allows for disaggregation between financial inflows by foreigners, investments and disinvestments into the receiving economy, what we call *gross foreign inflows (GFI)*, and financial outflows by residents, investments and disinvestments from the economy to overseas, defined here as *gross domestic outflows (GDO)*. Further disaggregation by instruments allows disentangling gross flows as international reserves, foreign direct Investment (FDI) flows, portfolio flows and other investment flows.

¹³ Possible explanations are that residents are more willing to repatriate assets when are confident about the strength of their currency or about the ability of the authorities to manage financial instability.

¹⁴ While our approach is similar to Broner et al. (2013), there are significant differences between it and Rothenberg and Warnock (2011) and Forbes and Warnock (2012). These papers focus on extreme changes in capital flows, disregarding whether they occur in periods of systemic financial stress. In addition, Rothenberg and Warnock (2011) use contractions in monthly international reserves to classify episodes as either capital flight or true sudden stops, depending on whether the change in reserves is driven by gross domestic outflows or gross foreign inflows.

¹⁵ For instance, the large drop on capital flows in the last quarter of 2008 occurred after several quarters of large inflows. Thus, using annual data would hide this sharp contraction.

¹⁶ To avoid their high and volatile flows drive the analysis, we dropped a number of financial centers (Ireland, Iceland, Luxembourg and Hong-Kong).

Using this information we construct the following aggregates in GDP terms. First, we define a measure of total financial investments by non-residents in the reporting economy (*GFI*, gross foreign inflows), which includes all three categories: FDI, portfolio inflows and other inflows. Second, we define an analogous measure of total financial investments by residents in the reporting economy overseas (*GDO*, gross domestic outflows), excluding central banks' purchases and sales of international reserves.¹⁷ Using these two aggregates we construct a measure of net capital flows, $NF = GFI - GDO$.¹⁸ Finally, we define *short-term gross foreign inflows*, *GFIST*, by adding up portfolio and other investment flows by non-residents in the reporting economy; and *short-term gross domestic outflows*, *GDOST*, using analogous information regarding residents' activity. For all of these variables we construct a four-quarter cumulative version,

$$\tilde{x}_{it} = \sum_{t=-3}^0 x_{it} \text{ where } x_{it} = \{GFI, GDO, NF, GFIST, GDOST\}$$

Smoothing the series using a cumulative measure has two important advantages. First, it reduces the importance of dating exactly the quarter in which the episode of global financial stress unfolds. Second, it minimizes the importance of country-specific idiosyncratic events. However, it also entails a cost as it washes out the impact of the shock. Additionally, we follow Broner et al. (2013) and standardize the series by dividing them with their corresponding standard deviation: $\hat{x}_{it} = \frac{\tilde{x}_{it}}{\sigma_{\tilde{x}_i}}$.

This is done to reduce the impact on the estimation of the most volatile countries.

The final component of the database is the stock of reserves, which come from the IMF's International Financial statistics. In order to assess the level of reserves the choice of the variable relative to which reserves are measured is fundamental. There is an ample literature on reserve adequacy which can be used as a guide for the choice. One of the most popular adequacy rules is the Guidotti-Greenspan rule, according to which reserves should cover short-term external liabilities (maturing in less than one year). Other rules look at reserves as a fraction of foreign currency liabilities, short term external debt, imports or monetary aggregates. There is no best measure, as different measures provide different insights.¹⁹

Given our focus on the distinct behavior of resident and foreign investors, in this paper we look at the level of reserves relative to two measures. First, we define a measure of the total resources which foreigners can pull out of the country –foreign liabilities, as collected by the IMF's International Investment Position data. Additionally, we look at a the level of reserves relative to the domestic monetary aggregate M2, which proxies the resources which residents can invest overseas, and takes into account the risk of experiencing a capital flight from residents (Obstfeld et al., 2008). Hence, we define the following variables:

¹⁷ Due to the nature of the exercise, our *GDO* measure does not include changes in central banks' international reserves.

¹⁸ *NF* does not match the current account, which also includes errors and omissions and exceptional financing items.

¹⁹ See IMF (2011) for a recent analysis of some of the most popular rules-of-thumb.

$$RX_t = R_t / X_t \text{ where } X_t = \{IFL_t, M2_t\}.$$

Where R_t stands for international reserves, IFL_t represents the international liabilities of the country and $M2_t$ stand for the country M2 monetary aggregate. Then, $RIFL_{it}$ measures the level of reserves relative to potential outflows from non-residents. In turn, $RM2_{it}$ measures the level of reserves relative to potential outflows from residents.

The correlation between these two measures of reserves is relatively low, suggesting that, as detailed below, $RILF$ and $RM2$ provide different insights. Additionally, although we formally test it, the low correlation between our reserve indicators and both exchange rate regime and credit rating indicators suggest that the results we obtain cannot be solely explained by the relation of reserves with any of these two indicators.

3. Preliminary evidence²⁰

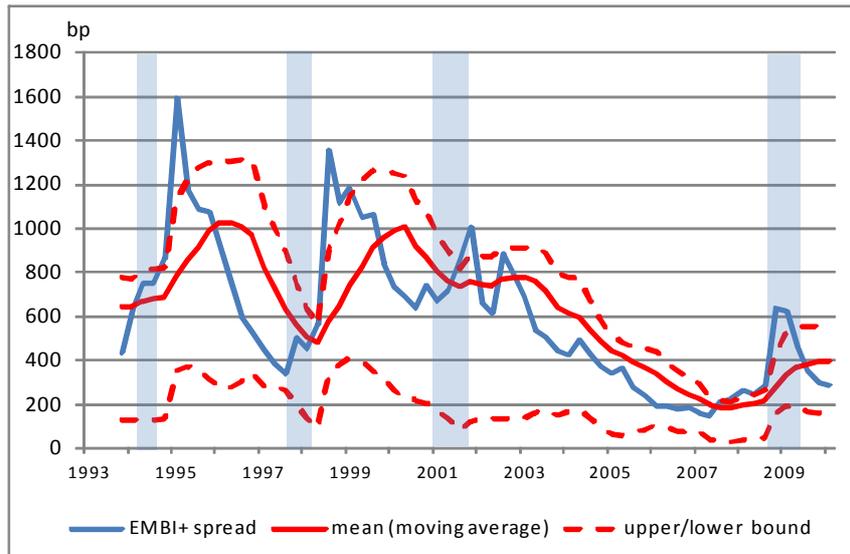
We begin our assessment of the role of reserves in the dynamics of gross flows by plotting their behavior in periods of financial stress both unconditionally and by making such behavior relative to the level of reserves of the countries.

Following Calvo et al. (2008), the Global EMBI+ Index can be used to identify periods of global financial stress in emerging economies.²¹ The periods of global financial stress are defined as those quarters in which the Global EMBI+ spread i) is above two standard deviations over its eight-quarter moving average and ii) reaches the maximum in a four-quarter window. As shown in Graph 2, this methodology returns four events: the first quarter of 1995, the third quarter of 1998, the fourth quarter of 2001 and the fourth quarter of 2008. The graph shows the evolution of the EMBI spread, its time-varying mean and a two standard deviation window around this mean. The quarters identified as events are shadowed, and they correspond roughly, to the Tequila, Russian, Argentinean and Lehman crises.

²⁰ For more details, see Alberola, Erce and Serena (2012).

²¹ Importantly, the Global EMBI represents the universe of emerging market sovereign issuers and is not driven by one country's economic conditions.

Graph 2: Global EMBI. Events of financial stress

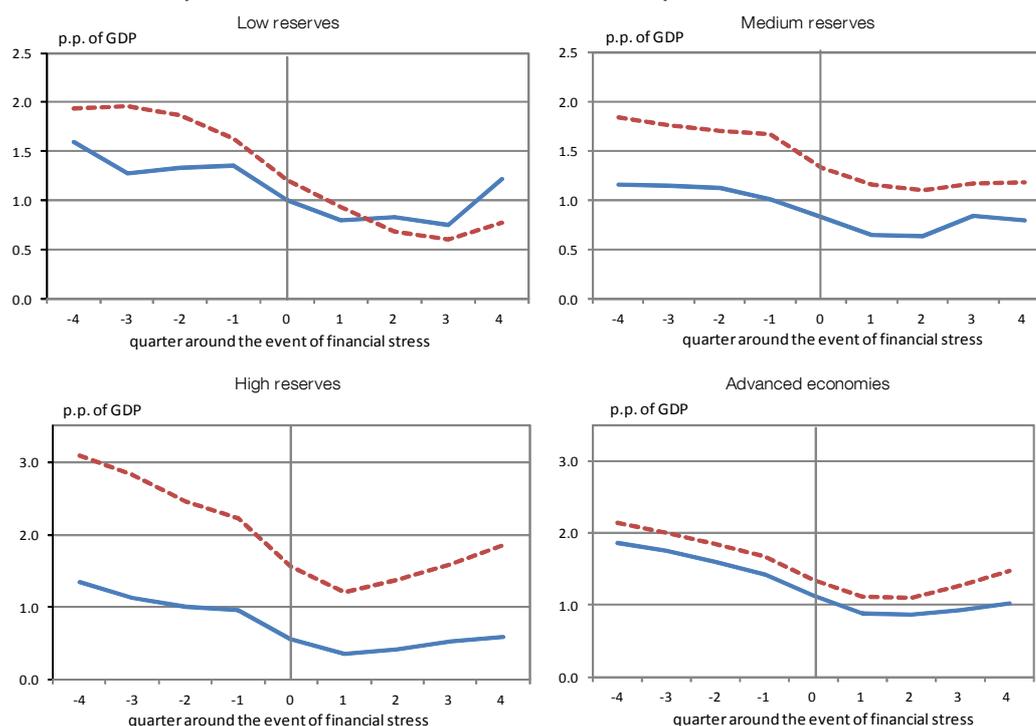


Source: JP Morgan and authors' calculations. Global EMBI-mean is the eight-quarter moving average of the Global EMBI. Upper/Lower bounds are defined as the EMBI-mean plus(minus) the last eight-quarters standard deviation of the Global EMBI. Quarters of financial stress are dashed (1Q95, 3Q98, 4Q01, 4Q08).

The next step is to identify how gross flows evolve during these episodes conditioning on the level of reserves held by the different countries' Central Banks. To have a graphical intuition of this behavior, countries can be grouped according to their level of reserves –measured in terms of the (narrow) M2 monetary aggregate- at the onset of each period of financial stress: the high level group comprises the those emerging economies with the highest reserves (percentiles 80-100%); to the low level group, in contrast, belong those with the lowest reserves (percentiles 0-20%) and the rest is placed in the middle reserves group. The advanced countries are grouped in the fourth group, which also serve as reference.

Graph 3 displays the average behavior of gross capital measures for each reserve group, taking as reference the reserve to financial liabilities ratio. The quarter of the event is defined as $t=0$, so that we can observe the dynamics for the four periods before and after the event. The red dashed lines represents the gross financial inflows by non-residents (*GFI*) and the solid blue line the gross domestic outflows, (*GDO*). Note that gross financial inflows plunge around periods of financial stress for all four groups. Conversely, gross financial outflows contract substantially in advanced countries and high-reserves emerging countries, but not in medium-reserve and low-reserve countries.

Graph 3. Financial inflows and domestic outflows around episodes of financial stress



Note: Financial inflows, red dashed-line; domestic outflows, solid blue. Financial inflows and domestic outflows are last four-quarters flows, measured in GDP terms, standardized by country-specific standard deviation. Emerging economies are classified in three groups according to their ratios of international reserves to Monetary Aggregates in each of the four quarters of financial stress (1Q95, 3Q98, 4Q01, 4Q08). "High reserves" and "Low reserves" include the 20% of countries with highest/lowest international reserves -the remaining 60% are included as "Medium reserves". Advanced economies are presented as benchmark, irrespective their level of reserves.

This graphical evidence is strongly endorsed by the econometric event analysis developed in detail in Alberola et al (2012). This preliminary evidence points at the following pattern: a high level of reserves does not prevent the reduction of capital inflows during stress periods, but it significantly stems domestic financial outflows, helping to mitigate the squeeze in net capital inflows.

4. International reserves during periods of stress. A panel data approach

In this section we formally test our previous findings in a more comprehensive framework by considering a number of determinants of the behavior of gross capital flows through a panel data analysis. As there is no agreed benchmark where to study the determinants of gross capital flows, we extend the analysis in Cowan et al. (2007) and Broner et al. (2013). Our baseline model includes the country's credit rating, the growth rate of GDP, the current account, the exchange rate regime, the VIX and the EMBI spread as controls. More specifically, we estimate the following equation:

$$(1) \hat{x}_{it} = \alpha + \theta_i + \rho_i t + \delta y_{it-1} + \epsilon_{it}$$

The model includes a constant, α ; country fixed-effects θ_i ; country-specific time trends, $\rho_i t$, and a vector y_{it-1} that collects the set of (pre-determined) economic controls mentioned above and our

metrics of international reserves. We estimate and further augment this model to investigate the role of reserves during financial stress, in the next three sections.

Financial markets view emerging economies as an asset-class. This, as argued by Forbes and Warnock (2012), makes contagion highly likely. To correct for the potential biases that the presence of cross-sectional correlation could create, we also perform the analysis using the Driscoll-Kraay estimator, which allows us to correct for the presence of cross-sectional correlation.

4.1 Basic model. Stress periods as dummies.

As a first step, we include a crisis dummy in y_{it-1} . This dummy is a binary variable taking value 1 in the quarter of the financial shock and each of the four subsequent quarters, and zero otherwise.²² In order to gauge the effect of reserves during stress periods, we include among the set of explanatory variables interaction of the crisis dummy with our measures of international reserves. To control for potential non-linear effects associated with sudden stops we include quadratic terms. The simultaneous introduction of reserve indicators, stress indicator and their interaction allows us to interpret the β coefficients as the specific relation between reserves and the corresponding gross flows during periods of financial stress.

Table 1 shows the results for gross foreign inflows (*GFI*) and gross domestic outflows (*GDO*) using reserves measured in terms of the domestic monetary aggregate (*M2*). Table 2 does the same using the results when reserves are measured as a fraction of international liabilities.

The first and fourth columns in both tables show the benchmark model for *GFI* and *GDO*. *Foreign inflows* are positively associated to higher ratings and GDP growth, and negatively correlated with the current account and the EMBI Index. There is no significant correlation with either the VIX or the exchange rate regime indicators. As regards domestic outflows, GDP growth affects positively *GDO*, while EMBI and VIX indices affect them negatively and significantly. These results, which highlight the pro-cyclicality of gross flows, are similar to those in Broner et al. (2013).²³

In the remaining columns we extend the model as detailed above model and include the ratio of reserves (linear and quadratic), the crisis dummy, and the interactions of both. The results for inflows and outflows are remarkable different.

Foreign inflows are not significantly affected by reserves, no matter if they are measured in terms of *M2* (Table 1) or international liabilities (Table 2). This holds for normal and stress periods, as reflected by the lack of significance of the interaction between crisis and reserves. Only the non-linear term of reserves measured in terms of foreign liabilities has a significant, negative, impact on

²² We chose four quarters so as to match the window analyzed in the event analysis.

²³ Our results are also in line with those in Forbes and Warnock (2011) who, focusing on extreme movements on gross flows, find that while global factors strongly affect both residents and foreigners' behavior, domestic macroeconomic factors are most related to foreign capital flows.

foreign inflows. Very large reserves seem to accompany a relatively stronger drop in external financing. When we control for cross-sectional correlation (column 3), the results do not change substantially, only the exchange rate regime indicators become significant.

These results are in stark contrast with those for domestic outflows. As reported in Table 1, the event dummy has a positive and statistically significant effect. In emerging economies domestic outflows are higher during stress times, everything else equal. This result has to be assessed jointly with the impact of ratios of reserves to M2 during stress times. We find that they have a non-linear and statistically significant impact on GDO. The negative-linear and positive-quadratic coefficients indicate that while accumulating reserves initially reduces the outflows, this effect vanishes beyond a threshold. This result is robust to using a fixed effect estimator (column 5) or a model that corrects for cross-country correlation (column 6). The results in Table 1 also show that, once we expand the model to include reserves and the crisis dummy, the size of the EMBI coefficient is smaller and less significant (column 5). Indeed, once we control for cross-sectional correlation, the coefficient associated with the EMBI is no longer significant (column 6).

All together, the results suggest that although outflows tend to increase during episodes of financial stress, the stock of reserves mitigates that effect but only up to a certain stock of reserves. A similar, albeit less robust, effect is found when we use reserves to financial liabilities (see columns 3 and 4 of table 2).

4.2. Accounting for the intensity of stress

The next step to understand the relevance of reserves is to take into account the intensity of the stress. As shown in graph 2, financial stress fluctuates strongly over time: there are other spikes in financial stress –albeit not to extreme levels–, and periods of different financial stability. Moreover, it is evident that the four periods under scrutiny featured different stress intensities.

To gauge the relevance of stress intensity we interact reserve adequacy ratios with our measure of stress, the EMBI spread, $EMBI_{it} * RX_{it}$. As before, we include linear and quadratic terms of reserve adequacy. As in the previous specifications, the joint introduction of reserves indicators, the EMBI and the interaction of both allows us to interpret the β coefficients as the specific relation between reserves and \hat{x}_{it} as a function of the degree of financial stress.²⁴

Tables 3 presents the results on gross domestic outflows, total and short term, respectively. We present the results when international reserves are scaled using the monetary aggregate M2. As expected, reserves to monetary aggregates (M2) is a more relevant metric when studying domestic residents' investment decisions²⁵. As before, when we correct for cross-sectional correlation using

²⁴ Accordingly we drop the crisis indicator, which becomes redundant.

²⁵ Reserves to international liabilities fail to have a significant effect on resident investments' overseas in the robustness checks and extensions. Results are available upon request.

the Driscoll-Kraay estimator (column 1), the ratio of reserves has a non-linear on domestic outflows. Reserves do contribute to reduce domestic outflows, and this effect is stronger the worse financial stress is.

Interestingly, international reserves affect more strongly short-term domestic flows, which are the flows whose dynamics have a more volatile nature. In the case of short term outflows the results also hold (Table 3, column 5).

Our analysis so far has focused on emerging economies. We investigate next whether reserves determine as well capital flows dynamics in advanced economies during stress times. We find that the stabilizing impact on domestic outflows we have documented for emerging economies is absent in advanced economies. Indeed, column 2 shows how in advanced economies reserves have quite the opposite effect on domestic outflows: they do increase, as financial stress mounts, the higher international reserves are. Short-term domestic outflows do not depend on reserves in the subsample of advanced economies (column 6). In advanced economies, probably reflecting their character as a source of funds, domestic outflows do contract when financial stress increases.

We investigate next the impact of reserves on domestic capital flows from a forward looking perspective. In previous results we have used as dependent variable four-quarter cumulative financial flows. Although the use of cumulative measures is standard in the literature, their use poses a problem in understanding the estimated coefficient as being associated to the present instead of to past observations. To assess the relevance of such concern we construct a new dependent variable: the sum of financial flows in the current quarter, and three quarters ahead. Such measure allows investigating in more detail the response of capital flows to the explanatory variables. The results, shown in column 7, confirm our previous findings on total and short-term domestic outflows dynamics. Short-term domestic outflows have the expected non-linear relationship with reserves holdings –linear negative effect, positive quadratic term–, which increases with the degree of financial stress. Interestingly, they increase with financial stress (measured by the EMBI), as we found previously in table 1. These results do not hold for domestic outflows (column 3), confirming that short-term flows are more responsive to reserves to M2 as financial stress mounts.

Finally, we acknowledge that, as documented by Broner et al. (2013), domestic outflows and foreign inflows are highly synchronized. For that reason, as robustness test we introduce them as explanatory variables in the equation (results are shown in columns 4 and 8). Our main results still hold. The results are similar for both overall and short-term outflows; they tend to increase as financial stress increases, but have the aforementioned non-linear relationship with reserve holdings.

We turn now to Table 4 that presents the results for gross financial inflows: As before, the results were less robust. In what follows we focus on the interaction between financial stress, and the ratios of reserves. For addressing the behavior of foreign investors we measure reserves as the

ratio with respect to international liabilities, which our previous analysis showed to be a more relevant metric.

The sign of the control variables remains similar to that of benchmark estimations shown in tables 1 and 2. As for the role of financial stress and international reserve measures, the results show that gross inflows (GFI) contract when financial stress increases –the EMBI has a negative sign. Reserves to financial liabilities have a non-linear impact on foreign inflows: there is a positive linear effect, which decreases with the level of reserves –since the quadratic term is negative (column 1).

This finding is qualitatively akin to the one found for gross domestic outflows -available financing decreases as financial instability mounts, but reserves have a stabilizing role-. There are, however, remarkable differences in the size. These differences are relevant, since, as discussed below, reserve holdings are not enough to prevent a reduction of foreign financing in periods of stress.²⁶

The stabilizing role of reserves on gross inflows is specific to emerging economies: column 2 shows that in advanced economies the interactions terms (linear and quadratic) are not significant. These results are also robust to the inclusion of gross outflows in the equation –to take into account simultaneity of inflows and outflows, in columns 4 and 8-, but not to the use as dependent variable of the cumulative forward looking financial inflows, in columns 3 and 7.

All in all, the stabilizing role of reserves is more robust on domestic outflows –in particular, short-term-, and less so for foreign inflows.

4.3. Economic significance of the results

We turn now to discuss the economic significance of the results: the extent to which international reserves impact gross capital flows dynamics as financial stress mounts. The results presented are those obtained from the more robust specification, the one that controlling for cross-sectional correlation (column 1 of Table 3 for outflows and column 1 of Table 4 for inflows).

We compute and plot the estimated economic joint effect of financial stress and reserves by multiplying the (standardized) effect on capital flows by the median of the country-specific capital flows standard-deviation.²⁷ The standardized effect is obtained by computing the effect of various combinations of reserves and financial stress using the estimated coefficients. We include 95% confidence bands of the estimation.²⁸

The effect of reserves, as a fraction of the country's monetary aggregate, on domestic outflows, is depicted in graph 4 below. Since the bulk of observations of reserves to M2 are below 90%, we

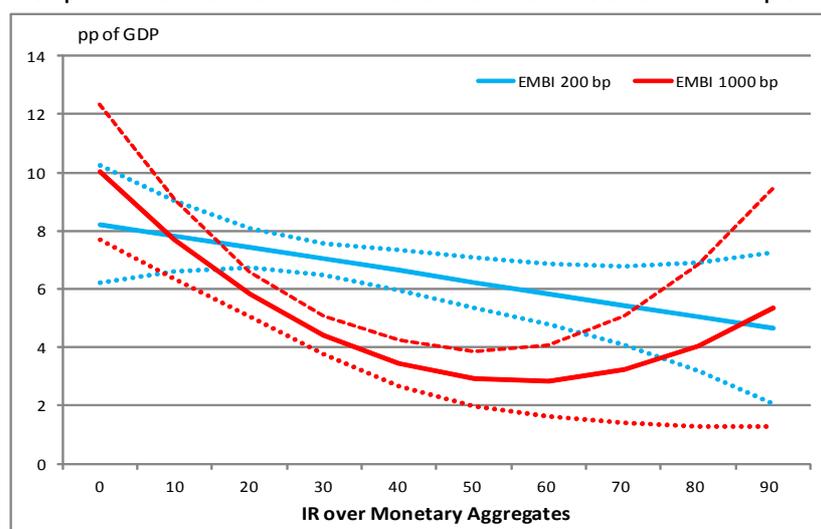
²⁶ As we discuss below, these quantitative differences are so significant that the net effect during financial stress are quite the opposite.

²⁷ Note that in all estimations we use financial inflows/domestic outflows divided by the country-specific standard deviation (as described in section 2)

²⁸ We measure the rest of the explanatory variables at their means: this way we show the marginal effect of international reserves to M2, for the average emerging economy (the VIX is also measured at its mean).

focus on the interval 0-90%. As shown in the graph, under severe financial stress a low ratio of reserves –below 10%- can imply higher domestic outflows than in periods of reduced spreads. However, domestic outflows drop sharply up to ratios around 60%, and hitherto increase again, and reach higher values than under no stress for ratios around 90%. These results are statistically significant, but confidence bands widen as reserves become higher. Interestingly, the curves of expected domestic outflows during stress and in normal times intersect in two points: this implies that as financial stress increases, for some levels of reserves to M2 there is a contraction of domestic outflows; in others, as the beneficial effect of reserves fades, there is an increase.

Graph 4. Domestic outflows as a function of International Reserves and EMBI spread



Note: IR stand for International Reserves. Ir measured relative to Monetary Aggregates. Graph is constructed using the coefficients of column 1 of table 4. All the variables, but IR to Monetary Aggregates. and the EMBI, are measured at their average values. IR over International Liabilities are measured in an interval which comprises 99% of the observations. Global EMBI is measured at two values: 1000 bp is the average of the Global EMBI during the four events of financial stress, while 200 bp is the average value of the last twelve quarters before the global financial crisis. Domestic outflows are rescaled with the average standard deviation. Dotted lines are 95% confidence intervals.

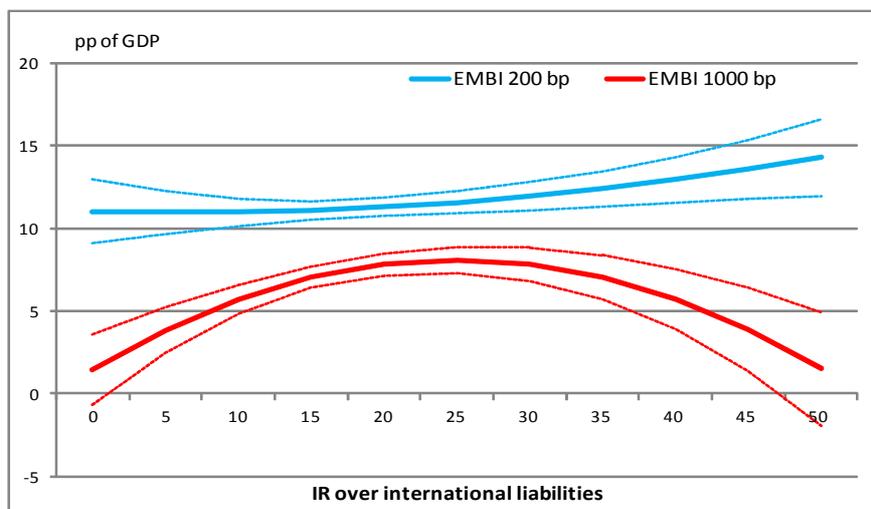
As for the economic significance of the results in periods of financial stress, it is substantial: domestic outflows might contract up to 6 percentage points of GDP for an average country and mitigate the reduction in capital inflows in the order of 5 p.p. of GDP, although in the case of inflows the econometric results are somewhat less robust. Such reduction can contribute to stabilize the generalized drought in foreign financing which emerging economies frequently experience during financial stress.

In turn, Graph 5 shows the effect of reserves, in terms of international liabilities, on financial inflows. In order to gauge intuition about the importance of reserves during stress periods we compare their effect in two different scenarios. One where the EMBI is at 200 bp, reflecting normal times; and another one reflecting stress times with a value for the EMBI of 1000 bps.²⁹ The bulk of

²⁹ 1000 bp is the average EMBI spread on the four episodes of financial stress in our sample.

observations of reserves to international financial liabilities are below 50% (slightly below percentile 99%), so we analyse that interval.

Graph 5. Foreign inflows as a function of International Reserves and EMBI spread



Note: IR stand for International Reserves. IR measured relative to International Liabilities. Graph is constructed using the coefficients of column 1 of table 4. All the variables, but IR to International Liabilities and the EMBI, are measured at their average values. IR over International Liabilities are measured in an interval which comprises 99% of the observations. Global EMBI is measured at two values: 1000 bp is the average of the Global EMBI during the four events of financial stress, while 200 bp is the average value of the last twelve quarters before the global financial crisis. GFI are rescaled with the average standard deviation. Dotted lines are 95% confidence intervals.

A first issue worth mentioning is that financial inflows are lower, for higher levels of EMBI spreads, for any ratio of reserves to financial liabilities. At low levels of financial stress –low spreads-, financial inflows are stronger for countries with higher ratios of reserves. This changes once financial stress mounts. For higher levels of spreads, higher reserves mitigate the reduction in capital inflows, but only up to a certain threshold –ratios of reserves to financial liabilities around 25% as the U-shaped curve -.Beyond that threshold, foreign inflows are reduced again.

To sum up, the results of this exercise show that international reserves might be relevant during financial stress in a somewhat unexpected way. While they do not prevent a reduction in foreign inflows –albeit higher reserves can mitigate it-, they facilitate financial retrenchment by residents.

5. Conclusions

In this paper we characterize the dynamics of gross capital flows around periods of global financial stress and relate them to the countries' holdings of international reserves. In contrast to previous contributions focusing on net flows, we delve into gross capital inflows and outflows.

A simple visual inspection highlights differences across countries in financial flow dynamics around periods of global financial stress. In advanced countries foreign inflows and domestic outflows contract in a systemic way. Conversely, in non-OECD countries, while financial inflows do fall no matter what the level of reserves, domestic outflow dynamics change depending on international

reserve holdings. In high-reserve countries domestic outflows are significantly lower during financial stress while in low-reserve countries there is no such retrenchment, and we even find signs of capital flight. This led us to hypothesize that reserves play a catalytic role vis-à-vis resident investors.

To assess the robustness of this result we have presented a panel data evidence where additional controls were added. Our results suggest that capital flows are pro-cyclical and that country-specific variables are less important in explaining gross domestic outflows than global factors. More importantly, our panel results provide robust evidence that international reserves are associated with a mitigation of the reduction of financial inflows and with a higher propensity of resident investors to repatriate capital invested abroad during periods of global stress. Cowan et al. (2007) and Broner et al. (2013) document that, on average, domestic capital retrenches during crises, a result in contrast to the notion of recurrent domestic capital flight documented in Forbes and Warnock (2012) and Rothenberg and Warnock (2011). Our results show that taking into account the stock of reserves held by the Central Bank is one way to reconcile these two sets of results. Countries with low reserves are more likely to see their residents place their capital abroad during crises. The opposite happens when a country's Central Bank has an abundant stock of reserves. We believe this is an important result that should be considered when modeling international capital flows.

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Appendix

Countries under study

Advanced economies: Australia; Austria; Canada; Denmark; Finland; France; Germany; Greece; Italy; Japan; Netherlands; New Zealand; Norway; Portugal; Spain; Sweden; Switzerland; UK; US.

Emerging economies: Argentina; Armenia; Azerbaijan; Bangladesh; Belarus; Bosnia-Herzegovina; Brazil; Bulgaria; Cambodia; Colombia; Croatia; Czech Rep; Chile; Ecuador; Estonia; Georgia; Hungary; India; Indonesia; Israel; Jordan; Kazakhstan; Korea; Latvia; Lithuania; Macedonia; Malaysia; Mexico, Moldova; Morocco; Pakistan; Peru; Philippines; Poland; Romania; Russian Federation; Singapore; Slovak Rep.; Slovenia; South Africa; Thailand; Turkey; Uruguay; Venezuela.

Data description

Financial flows: Data comes from IMF's International Financial Statistics (IFS). The variables used to compute gross financial outflows are Direct Investment Abroad (line 78 bdd), Portfolio Investment Assets (line 78 bfd), Other Investment Assets (line 78 bwd) and Changes in reserves (line 79 dbd). On the other hand, gross financial inflows include Direct Investment in the Reporting Economy (line 78 bed), Portfolio Investment Liabilities (line 78 bgd) and Other Investment Liabilities (line 78 bid).

International financial liabilities & M2: We construct data on international financial liabilities mixing the updated version of the External Wealth of Nations Mark II database (Lane and Milesi-Ferretti, 2007) with data from IFS. We consider the first source more reliable for earlier dates. Data, on an annual basis, was interpolated to obtain quarterly figures. In terms of IFS coding, the variables employed are International financial liabilities (line 79 lad) and reserve assets (line 79 akd). We measure of M2 as the sum of lines 34 and 35, from International Financial Statistics.

Data on financial spreads and credit ratings: We use the JP Morgan Emerging Market Bond Index (EMBI) Global (less liquid but more diversified than the EMBI+), which is a traditional, market-capitalization-weighted index. The credit ratings were obtained from Standard & Poor's.

Exchange rate regime: Exchange rates regimes are classified using the Reinhart and Ilzetki (2008) classification. This classification takes four values, from 1 to 4, being 1 the most fixed regimes and 4 the most flexible. We regroup them in three groups: a "fixed exchange rate regime" group comprising observations with a value 1; a "managed exchange rate regime group", comprising observations with values 2 and 3; a "flexible exchange rate regime", comprising observations with a value 4.

VIX index: We obtained the VIX index, as produced by the Chicago Board Options Exchange, from Datastream.

Table 1. Gross capital flows. International Reserves to Monetary Aggregates

VARIABLES	Foreign Inflows			Domestic outflows		
	(1) FE	(2) FE	(3) DK	(4) FE	(5) FE	(6) DK
Current account	-0.095*** [0.012]	-0.099*** [0.015]	-0.099*** [0.007]	-0.006 [0.016]	0.008 [0.014]	0.008 [0.010]
Peg exchange rate	0.279 [0.304]	0.367 [0.315]	0.367** [0.144]	-0.177 [0.227]	-0.167 [0.197]	-0.167 [0.182]
Managed exchange rate	0.187 [0.189]	0.199 [0.218]	0.199 [0.122]	-0.141 [0.172]	-0.052 [0.162]	-0.052 [0.091]
S&P rating	0.100*** [0.026]	0.103*** [0.027]	0.103*** [0.012]	-0.005 [0.032]	-0.001 [0.030]	-0.001 [0.020]
GDP real growth	0.051*** [0.010]	0.031** [0.014]	0.031*** [0.010]	0.021** [0.009]	0.003 [0.007]	0.003 [0.006]
EMBI	-0.087*** [0.016]	-0.065*** [0.019]	-0.065** [0.026]	-0.054*** [0.018]	-0.035* [0.020]	-0.035 [0.026]
VIX	-0.004 [0.004]	-0.003 [0.004]	-0.003 [0.006]	-0.019*** [0.006]	-0.019*** [0.006]	-0.019*** [0.005]
EVENT		-0.078 [0.269]	-0.078 [0.215]		0.459* [0.253]	0.459 [0.286]
EVENT*IR over Monetary Aggregates		-0.010 [0.014]	-0.010 [0.009]		-0.034** [0.014]	-0.034* [0.018]
EVENT*IR over Monetary Aggregates^2		0.000 [0.000]	0.000* [0.000]		0.000** [0.000]	0.000* [0.000]
IR over Monetary Aggregates		-0.004 [0.016]	-0.004 [0.005]		-0.024 [0.018]	-0.024*** [0.007]
IR over Monetary Aggregates^2		0.000 [0.000]	0.000** [0.000]		0.000 [0.000]	0.000** [0.000]
Observations	1,948	1,827	1,827	1,855	1,740	1,740
R-squared	0.51	0.54		0.31	0.37	
Number of groups	41	40	40	42	41	41

Note: Dependent variable "Foreign inflows" includes the investments in each country by non-residents; "Domestic" is defined as the investments overseas by residents. IR stands for International Reserves. EVENT is a binary variable which takes value 1 in the quarters of financial stress (1Q95,3Q98,4Q01,4Q08), and the subsequent four quarters. All models include country-specific trends and country dummies. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 2. Gross capital flows. International Reserves to International Liabilities

VARIABLES	Foreign Inflows		Domestic outflows	
	(1) FE	(2) DK	(3) FE	(4) DK
Current account	-0.108*** [0.012]	-0.108*** [0.006]	0.003 [0.016]	0.003 [0.008]
Peg exchange rate	0.295 [0.312]	0.295** [0.135]	-0.108 [0.197]	-0.108 [0.157]
Managed exchange rate	0.157 [0.197]	0.157 [0.112]	-0.052 [0.164]	-0.052 [0.104]
S&P rating	0.081*** [0.029]	0.081*** [0.014]	0.033 [0.026]	0.033* [0.018]
GDP real growth	0.042*** [0.010]	0.042*** [0.008]	0.022** [0.008]	0.022** [0.010]
EMBI	-0.062*** [0.021]	-0.062** [0.027]	-0.026 [0.021]	-0.026 [0.027]
VIX	-0.001 [0.004]	-0.001 [0.005]	-0.017*** [0.006]	-0.017*** [0.005]
EVENT	-0.383 [0.275]	-0.383* [0.223]	0.114 [0.315]	0.114 [0.228]
EVENT*IR over International Liabilities	0.030 [0.020]	0.030 [0.018]	-0.034 [0.028]	-0.034** [0.016]
EVENT*IR over International Liabilities, quadratic	-0.001** [0.000]	-0.001*** [0.000]	0.001 [0.001]	0.001* [0.000]
IR over International Liabilities	0.016 [0.022]	0.016 [0.014]	-0.023 [0.026]	-0.023 [0.018]
IR over International Liabilities , quadratic	0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]
Observations	1,859	1,859	1,773	1,773
R-squared	0.54		0.36	
Number of id	40	40	41	41

Note: Dependent variable "Foreign inflows" includes the investments in each country by non-residents; "Domestic" is defined as the investments overseas by residents. IR stands for International Reserves. EVENT is a binary variable which takes value 1 in the quarters of financial stress (1Q95,3Q98,4Q01,4Q08), and the subsequent four quarters. All models include country-specific trends and country dummies. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 3. Domestic outflows. Robustness checks and extensions

VARIABLES	Domestic				Domestic short-term			
	(1) Emerging	(2) Advanced	(3) Emerging Forward looking	(4) Emerging Simultaneity	(5) Emerging	(6) Advanced	(7) Emerging Forward looking	(8) Emerging Simultaneity
Current account	0.005 [0.009]	0.057** [0.025]	-0.002 [0.012]	0.059*** [0.008]	0.014 [0.009]	0.057** [0.026]	-0.003 [0.013]	0.061*** [0.008]
Peg exchange rate	-0.166 [0.169]	0.000 [0.000]	-0.174 [0.153]	-0.386** [0.148]	-0.329** [0.156]	0.000 [0.000]	-0.327* [0.173]	-0.525*** [0.148]
Managed exchange rate	-0.061 [0.087]	0.000 [0.000]	-0.011 [0.121]	-0.214** [0.092]	-0.176 [0.105]	0.000 [0.000]	-0.119 [0.120]	-0.311*** [0.109]
S&P rating	-0.006 [0.019]	-0.009 [0.082]	-0.032 [0.027]	-0.052*** [0.018]	-0.005 [0.021]	0.030 [0.077]	-0.023 [0.029]	-0.044** [0.019]
GDP real growth	0.008 [0.007]	0.157*** [0.033]	0.015 [0.011]	-0.009 [0.007]	0.007 [0.007]	0.116*** [0.032]	0.012 [0.012]	-0.010 [0.007]
EMBI	0.042 [0.047]	-0.092*** [0.027]	0.074 [0.063]	0.080* [0.040]	0.067 [0.043]	-0.107*** [0.028]	0.128** [0.051]	0.122*** [0.035]
VIX	-0.021*** [0.004]	-0.005 [0.012]	-0.030*** [0.008]	-0.017*** [0.003]	-0.024*** [0.003]	-0.015 [0.010]	-0.030*** [0.008]	-0.021*** [0.002]
EMBI*IR over Monetary Aggregates	-0.005** [0.002]	0.007* [0.004]	-0.006 [0.004]	-0.005** [0.002]	-0.006*** [0.002]	0.007 [0.004]	-0.007** [0.003]	-0.007*** [0.002]
EMB*IR over Monetary Aggregates^2	0.000** [0.000]	-0.000 [0.000]	0.000 [0.000]	0.000** [0.000]	0.000*** [0.000]	-0.000 [0.000]	0.000* [0.000]	0.000*** [0.000]
IR to Monetary Aggregates	-0.028** [0.011]	-0.029 [0.022]	-0.030** [0.014]	-0.020** [0.010]	-0.027** [0.011]	-0.047* [0.023]	-0.026** [0.013]	-0.023** [0.009]
IR to Monetary Aggregates^2	0.000* [0.000]	-0.000 [0.000]	0.000* [0.000]	0.000 [0.000]	0.000* [0.000]	-0.000 [0.000]	0.000* [0.000]	0.000 [0.000]
Foreign				0.554*** [0.031]				0.474*** [0.032]
Observations	1,773	1,148	1,736	1,768	1,784	1,148	1,747	1,779
Number of groups	41	21	41	40	41	21	41	40

Note: Dependent variable "Domestic" includes the investments overseas by residents; "Domestic short-term" includes only other investment and portfolio investment overseas. "Foreign" includes the investments in each country by non-residents. IR stands for International Reserves. All models include country-specific trends and country dummies. All models are estimated with the Driscoll-Kraay estimator. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 4. Foreign inflows. Robustness checks and extensions

VARIABLES	Foreign				Foreign short-term			
	(1) Emerging	(2) Advanced	(3) Emerging Forward looking	(4) Emerging Simultaneity	(5) Emerging	(6) Advanced	(7) Emerging Forward looking	(8) Emerging Simultaneity
Current account	-0.103*** [0.006]	-0.082*** [0.020]	-0.028** [0.013]	-0.104*** [0.006]	-0.099*** [0.007]	-0.085*** [0.021]	-0.026** [0.012]	-0.101*** [0.007]
Peg exchange rate	0.281* [0.140]	0.000 [0.000]	0.273 [0.206]	0.409*** [0.133]	0.433*** [0.147]	0.000 [0.000]	0.411* [0.234]	0.554*** [0.133]
Managed exchange rate	0.175 [0.112]	0.000 [0.000]	0.402** [0.150]	0.270** [0.116]	0.246** [0.107]	0.000 [0.000]	0.359** [0.160]	0.342*** [0.119]
S&P rating	0.082*** [0.015]	-0.168* [0.091]	0.129*** [0.018]	0.063*** [0.014]	0.073*** [0.016]	-0.088 [0.074]	0.110*** [0.019]	0.057*** [0.018]
GDP real growth	0.045*** [0.009]	0.192*** [0.033]	0.052*** [0.012]	0.032*** [0.007]	0.048*** [0.009]	0.168*** [0.031]	0.060*** [0.013]	0.038*** [0.007]
EMBI	-0.176*** [0.026]	-0.052* [0.027]	-0.060** [0.024]	-0.120*** [0.032]	-0.196*** [0.027]	-0.067** [0.026]	-0.049* [0.028]	-0.161*** [0.036]
VIX	-0.002 [0.005]	-0.007 [0.010]	-0.030*** [0.007]	0.004 [0.004]	-0.006 [0.004]	-0.014** [0.005]	-0.027*** [0.008]	-0.001 [0.004]
EMBI* IR over International Liabilities	0.010*** [0.002]	0.001 [0.004]	0.003 [0.002]	0.006** [0.003]	0.012*** [0.002]	0.003 [0.004]	0.001 [0.003]	0.010*** [0.003]
EMBI* IR over International Liabilities^2	-0.000*** [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000* [0.000]	-0.000*** [0.000]	-0.000 [0.000]	0.000 [0.000]	-0.000*** [0.000]
IR to international liabilities	0.039*** [0.011]	-0.138*** [0.031]	0.000 [0.017]	0.039*** [0.012]	0.062*** [0.009]	-0.122*** [0.034]	0.017 [0.017]	0.064*** [0.010]
IR to international liabilities^2	-0.001*** [0.000]	0.003*** [0.001]	-0.000 [0.000]	-0.000* [0.000]	-0.001*** [0.000]	0.002*** [0.001]	-0.001 [0.000]	-0.001*** [0.000]
Domestic				0.418*** [0.031]				0.321*** [0.032]
Observations	1,866	1,366	1,771	1,768	1,866	1,366	1,771	1,768
Number of groups	40	21	40	40	40	21	40	40

Note: Dependent variable "Foreign" includes the the investments in each country by non-residents; "Foreign short-term" includes only other investment and portfolio investment by non-residents. "Domestic" is defined as the investment overseas by residents . IR stands for International Reserves. All models include country-specific trends and country dummies. All models are estimated with the Driscoll-Kraay estimator. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 5 Foreign inflows. Reserves to financial liabilities

VARIABLES	(1) foreign emerging FE	(2) foreign Emerging DK	(3) foreign ST Advanced DK	(4) foreign all countries DK	(5) foreign four quarters ahead emerging DK	(6) foreign Emerging Simultaneity
domestic						0.418*** [0.031]
Current account	-0.099*** [0.016]	-0.103*** [0.006]	-0.085*** [0.021]	-0.091*** [0.006]	-0.028** [0.013]	-0.104*** [0.006]
Peg exchange rate	0.433* [0.254]	0.281* [0.140]	0.000 [0.000]	0.354** [0.142]	0.273 [0.206]	0.409*** [0.133]
Managed exchange rate	0.246 [0.170]	0.175 [0.112]	0.000 [0.000]	0.241** [0.112]	0.402** [0.150]	0.270** [0.116]
S&P rating	0.073*** [0.022]	0.082*** [0.015]	-0.088 [0.074]	0.077*** [0.015]	0.129*** [0.018]	0.063*** [0.014]
GDP real growth	0.048*** [0.011]	0.045*** [0.009]	0.168*** [0.031]	0.073*** [0.013]	0.052*** [0.012]	0.032*** [0.007]
EMBI	-0.196*** [0.048]	-0.176*** [0.026]	-0.067** [0.026]	-0.056 [0.034]	-0.060** [0.024]	-0.120*** [0.032]
VIX	-0.006 [0.004]	-0.002 [0.005]	-0.014** [0.005]	-0.008 [0.007]	-0.030*** [0.007]	0.004 [0.004]
R/FL [t-1]	0.062*** [0.019]	0.039*** [0.011]	-0.122*** [0.034]	-0.014 [0.015]	0.000 [0.017]	0.039*** [0.012]
R/FL [t-1], quadratic	-0.001*** [0.000]	-0.001*** [0.000]	0.002*** [0.001]	0.000 [0.000]	-0.000 [0.000]	-0.000* [0.000]
EMBI(demeaned)*R/ILF[t-1]	0.012*** [0.004]	0.010*** [0.002]	0.003 [0.004]	0.001 [0.003]	0.003 [0.002]	0.006** [0.003]
EMBI(demeaned)*R/ILF[t-1]^2	-0.000*** [0.000]	-0.000*** [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000* [0.000]
Observations	1,866	1,866	1,366	3,232	1,771	1,768
R-squared	0.52					
Number of id	40					
Country-trend Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	FE	FE	FE	FE	FE	FE
Year Dummies	No	No	No	No	No	No
Number of groups		40	21	61	40	40

Robust standard errors in brackets

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

Note: dependent variable Foreign are investments by residents; Foreign short-term are short-term investments by non-residents