

**GROSS CAPITAL FLOWS: DYNAMICS  
AND CRISES**

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## GROSS CAPITAL FLOWS: DYNAMICS AND CRISES

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## **Abstract**

This paper analyzes the joint behavior of international capital flows by foreigners and domestic agents over the business cycle and during financial crises. We show that gross capital flows by foreigners and domestic agents are very large and volatile relative to net capital flows. Namely, when foreigners invest in a country domestic agents tend to invest abroad, and vice versa. Gross capital flows are also pro-cyclical. During expansions, foreigners tend to bring in more capital and domestic agents tend to invest more abroad. During crises, especially during severe ones, there is retrenchment, i.e. a reduction in capital inflows by foreigners and an increase in capital inflows by domestic agents. This evidence sheds light on the nature of the shocks driving international capital flows and discriminates among existing theories. Our findings are consistent with shocks that affect foreigners and domestic agents asymmetrically — e.g. sovereign risk and asymmetric information — over productivity shocks.

**Keywords:** Gross capital flows, net capital flows, domestic investors, foreign investors, crises.

**JEL classification:** F21, F32.

## Resumen

Este trabajo analiza el comportamiento conjunto de los flujos de capital internacionales, en la frecuencia del ciclo de negocios y durante crisis financieras, por parte de residentes y no residentes. El trabajo muestra que, en relación a los flujos de capital netos, los flujos de capital brutos por parte de residentes y no residentes son grandes y muy volátiles. Esto es así porque, cuando los no residentes invierten en un país, los residentes de esa economía tienden a invertir más fuera. También se encuentra que los flujos de capital brutos son procíclicos. Durante periodos de expansión económica, los no residentes inyectan capital en la economía mientras que los residentes invierten fuera. Durante crisis hay «retrenchment», i.e. una reducción en la entrada de capital por parte de no residentes y una reducción en el patrón de inversión exterior de los agentes domésticos. Esto es especialmente significativo durante crisis severas y crisis sistémicas. Esta evidencia provee información sobre la naturaleza de los choques que guían el comportamiento de los flujos de capital internacionales. Los resultados parecen defender la preeminencia de choques que afectan a residentes y no residentes de forma asimétrica —p.e. riesgo soberano o información asimétrica— sobre choques de productividad.

**Palabras claves:** Flujos de capital brutos, inversores residentes, inversores no residentes, dinámicas, crisis.

**Códigos JEL:** F21, F32.

During the last decades, international capital flows have played an increasingly important role in the business cycles of developed and developing countries alike, especially during episodes of financial crises. Capital flows are volatile and pro-cyclical and crises are associated with declines in net capital inflows. These patterns are more extreme in emerging markets and have even motivated the use of the term sudden stops to refer to the large collapses in capital inflows that often accompany crises. Overall, there is a large literature analyzing the cyclical behavior of *net* capital flows.<sup>1</sup>

Net capital flows reflect in fact the joint behavior of foreign and domestic agents. In particular, net capital inflows are equal to the purchases of domestic assets by foreign agents minus the purchases of foreign assets by domestic agents. These *gross* capital flows, in turn, depend on the different incentives faced by foreign and domestic agents. For example, agents might invest directly in a firm located in a foreign country if they have access to a technology that is superior to that of domestic agents, an asset might be more attractive for some agents than others if it provides a better hedge to their non-pledgeable labor income, and sovereign risk might make the return of an asset depend on the residency of the agent who holds it. As a result, it seems reasonable to expect a different contribution to net capital flows by foreign and domestic agents.

A number of studies have analyzed long-run trends in gross capital flows.<sup>2</sup> But surprisingly, there are very few studies of the cyclical behavior of gross capital flows. The literature has so far focused on classifying episodes of abrupt reversals in capital inflows into those driven by foreign agents, or true sudden stops, and those driven by domestic agents, or episodes of capital flight.<sup>3,4</sup>

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<sup>1</sup> See, for example, Dornbusch, Goldfajn, and Valdés (1995), Kaminsky, Lizondo, and Reinhart (1998), Calvo, Izquierdo and Mejia (2002), Broner and Rigobon (2006), Levchenko and Mauro (2007), and Mendoza (forthcoming).

<sup>2</sup> See, for example, Lane and Milesi-Ferretti (2001, 2007), Kraay, Loayza, Servén, and Ventura (2005), Devereux (2007), and Gourinchas and Rey (2007a and 2007b). These studies have shown that gross capital flows have on average been sizeable, which has resulted in large gross international investment positions.

<sup>3</sup> See Faucette, Rothenberg, and Warnock (2005), Cowan, De Gregorio, Micco, and Neilson (2008), Forbes and Warnock (2010), and Rothenberg and Warnock (forthcoming).

However, many important questions remain unanswered. Are periods in which foreign agents purchase domestic assets also periods in which domestic agents sell foreign assets? In other words, do capital flows by foreign and domestic agents tend to move in tandem?<sup>5</sup> What is the behavior of gross capital flows over the business cycle and during financial crises? We know that crises are associated with reductions in net capital inflows. But are these reductions on average due to sales of domestic assets by foreign agents, purchases of foreign assets by domestic agents, or both?

The aim of this paper is to answer the type of questions above by analyzing systematically the dynamics of gross capital flows. For brevity, let *CIF* denote capital inflows by foreign agents and *COD* denote capital outflows by domestic agents. Positive *CIF* and *COD* both associate with increases in gross international investment positions. To construct *CIF* and *COD*, we use balance of payments data from the International Financial Statistics of the International Monetary Fund. *CIF* equals net purchases of domestic assets by non-residents and is thus equal to the sum of all liability inflows. *COD* equals net purchases of foreign assets by domestic agents and is thus equal to the negative of the sum of all asset inflows, including international reserves. Hence, net capital flows are equal to the difference *CIF-COD*.

Figures 1 and 2 show the evolution over time of *CIF* and *COD*, normalized by trend GDP, for a number of developed and developing countries. As an example, consider the case the United States. It is clear from the figure that gross capital flows behave very differently from net capital flows. For instance, the 2008 financial crisis was characterized by a sharp drop in gross capital flows in the United States, even though net flows have remained relatively stable. Furthermore, the observed positive comovement between *CIF* and *COD* indicates that capital inflows by foreigners

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<sup>4</sup> Other studies have analyzed the behavior of domestic and foreign investors around particular events and in specific markets. For example, Frankel and Schmukler (1996) focus on the behavior of mutual funds during the Mexican crisis, while Dvorak (2003) looks at equity flows in and out the United States.

<sup>5</sup> Dvorak (2003), Hnatkovska (2010) and Tille and van Wincoop (2010) report a positive correlation between foreign asset purchases by domestic agents and domestic asset purchases by foreign agents for the United States.



and outflows by domestic agents move in the same direction. As a consequence, gross capital flows are more volatile than net capital flows. As illustrated by Figures 1 and 2, such behavior is observed in most countries and during most crises in our sample. Overall, our main findings are:

(i) Over the last four decades, the volatilities of *CIF* and *COD* have been large and increasing, especially relative to the much lower volatility of net capital flows. This reflects the increasingly positive correlation between *CIF* and *COD*.

(ii) Gross capital flows are pro-cyclical. In other words, during expansions foreign agents increase their purchases of domestic assets and domestic agents increase their purchases of foreign assets. During crises, especially during severe ones, there is a reduction in gross capital flows. Both *CIF* and *COD* fall, although *CIF* tends to fall more as crises tend to be associated with lower net capital flows. The 2008 financial crisis is a clear example of such *retrenchment*, but we provide robust empirical evidence that capital retrenchment was a feature of previous episodes as well.

(iii) A decomposition of *CIF* and *COD* reveals interesting heterogeneity in the behavior of their components around crises. In the case of *CIF*, its reduction is due to declines in all its components for all country groups. In the case of *COD* for developed countries, its reduction is due to declines in equity, portfolio debt, bank flows, and direct investments, but not in reserves. For developing countries, declines in reserves play an important role in accounting for the reduction in *COD*, but there are also significant declines in equity, bank flows, and direct investments.

The rest of the paper is organized as follows. Section 1 describes the data. Section 2 characterizes the comovement of capital flows by foreigners and domestic agents. Section 3 analyzes the behavior of gross capital flows over the business cycle and during crises. Section 4 discusses the implications of our results regarding the sources of fluctuations in economies open to capital flows. Section 5 concludes.

## 1 Data

To document worldwide patterns of capital flows by domestic and foreign agents, we assemble a comprehensive dataset on aggregate gross capital flows, including not only capital inflows and outflows but also their subcomponents, reflecting the different flow types. The data come from the analytic presentation of the IMF's Balance of Payments Statistics Yearbooks (BOP).<sup>6</sup> The IMF's BOP dataset provides country-level data, on an annual basis from 1970 until 2009, on different types of capital inflows measured in U.S. dollars. Fundamental to our goal, this dataset allows us to disentangle capital outflows by domestic agents (*COD*) and capital inflows by foreigners (*CIF*), which are reported as flows related to the reporting country's assets and liabilities vis-à-vis non-residents, respectively. In other words, *CIF* is recorded as capital inflows to the reporting economy by foreign agents, indicating an increase in foreigners' holdings of domestic assets. Analogously, *COD* is reported as flows from the reporting economy, where positive values correspond to an increasing of the holdings of foreign assets by domestic agents.<sup>7</sup> Hence a negative *COD* should be interpreted as capital inflows by domestic agents whereas a positive *COD* means capital outflows.

Our dataset also allows us to analyze the behavior of the different types of capital flows. Flows are classified as: direct investments, portfolio flows, other investments (mostly bank flows and trade credit), and international reserves.<sup>8</sup> Portfolio flows are further divided into equity and debt flows. Both private and public flows are included in our dataset. Therefore, *CIF*, the aggregate capital inflows measure by foreigners, is equivalent to the sum of the following inflows: direct

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<sup>6</sup> Debt refinancing and rescheduling entries that involve changes in existing debt contracts or replacement by new ones, generally with extended debt service payments are excluded from our dataset. In the analytic presentation of the IMF's BOP, these flows (credit and debt entries that account for the new contracts) are computed within a country's financial account as exceptional financing items. Therefore, our analysis excludes items derived from the rescheduling or refinancing of existing debt contracts as they generally do not involve new capital inflows to the reporting country.

<sup>7</sup> These measures however do not capture increases in foreigners' (domestic agents') holdings of domestic (foreign) assets that are due to valuation effects.

<sup>8</sup> Due to their relatively small size and the scarcity of data, we exclude flows in financial derivatives from our analysis.

investments in the reporting economy, portfolio investment liabilities, and other investment liabilities. Similarly, *COD* is the aggregation of outflows of direct investments abroad, portfolio investment assets, other investment assets, and international reserve assets. As our aim is to shed light on both how large and how volatile capital flows are, we scale *CIF* and *COD* and their components by trend GDP throughout the paper.<sup>9</sup>

Our sample of countries is based mostly on data availability. However, we exclude countries that are either very small or poor. Small countries are a concern because they might display an artificially high volume of financial transactions due to their role as offshore financial centers or tax havens. A country is considered small if its gross national income (GNI) in 2005 was less than four billion U.S. dollars, PPP adjusted. Thirty countries are excluded from the analysis for this reason, among them Belize, Guyana, and Maldives. Poor countries generally depend heavily on official aid flows that behave differently than private capital flows, and are thus beyond the scope of our analysis. We exclude 46 countries with GNI per capita smaller than 2,000 current U.S. dollars, PPP adjusted, in 2005, among them Bangladesh, Ethiopia, and Niger.<sup>10</sup>

We classify our final sample of 103 countries into groups according to their income levels as measured by their GNI per capita in 2005. In particular, we classify low-income countries as those with GNI per capita below 7,500 U.S. dollars. Middle-income countries include those with GNI per capita between 7,500 and 15,000 U.S. dollars. These two groups, low- and middle-income countries, are sometimes referred to as developing countries in this paper. Lastly, high-income countries are those with GNI per capita above 15,000 U.S. dollars.<sup>11</sup>

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<sup>9</sup> Trend GDP is calculated by applying the Hodrick-Prescott filter to the series of nominal GDP in U.S. dollars. Nominal GDP is obtained from the *World Development Indicators*. If data for the last years of the sample was not available, we complemented our dataset with data from the *World Economic Outlook 2009*.

<sup>10</sup> We used 2005 data on both GNI and GNI per capita as using more updated data would reduce significantly our sample coverage. Moreover, the ranking of countries relative to the thresholds used in this paper does not change considerably over time.

<sup>11</sup> See Appendix Table 1 for the sample coverage. First and last years of available data are reported for each country.

In order to analyze capital flows around crises, we create a composite crisis indicator that takes into account banking, currency, and domestic and external debt crises on an annual basis. We consider the initial year of either one of these measures of crisis as the beginning of a crisis period. We then refine this aggregate indicator by considering as the beginning of a crisis period those periods in which a country experiences the beginning of a crisis, and no other crisis has been observed in the preceding two years.

In order to obtain the starting dates of these different crises, we use several indicators available in the literature. Banking crises come from the dating of crisis periods available in Honohan and Laeven (2005), Laeven and Valencia (2008), and Reinhart and Rogoff (2008). Currency crises are identified through the methodology in Laeven and Valencia (2008), which in turn follows Frankel and Rose (1996).<sup>12</sup> Under this definition, a country experiences a currency crisis if there is a nominal depreciation of the exchange rate of at least 30 percent that is also at least a 10 percent increase in the rate of depreciation of the previous year. For countries meeting this criteria for several consecutive years, only the first year within five-year windows is considered a crisis year in our analysis. Domestic debt crises are identified by the year in which Standard & Poor's downgrades the local currency debt of an economy into default. We also consider episodes identified in Reinhart and Rogoff (2008). Analogously, for external debt crises, we consider the crisis dating in Laeven and Valencia (2008) and Reinhart and Reinhart (2008) as well as Standard & Poor's downgrades of foreign currency debt and foreign currency bank loans of an economy to default levels. Appendix Table 2 lists all the crisis episodes considered in our sample.

We further classify these crises events into two different types of episodes depending on the intensity of the turmoil affecting a country. First, we define *one crisis* episodes in which a country

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<sup>12</sup> We use just one indicator of currency crises as most indicators described in the literature are constructed using data on reserves, one of our variables of interest, hence making them less appropriate for our analysis.

experiences the beginning of one, and only one, type of crisis in a given year, and no other type of crisis is observed in the preceding two years. The second episode type considers periods in which a country faces the beginning of more than one type of crisis within a given year, and no such event has occurred in the previous two years. These severe episodes are called *more than one crisis*. In sum, we distinguish between mild and severe crisis episodes according to the number of different types of crises a country faces in any given year.

The final database, after the sample adjustments mentioned above, covers 103 countries over the 1970-2009 sample period. There are 39 countries classified as high-income, and 28 of these countries have experienced at least one crisis during our sample period and five countries have faced severe crisis episodes. Our sample includes 26 middle-income countries, which have experienced significantly more turmoil than high-income countries. All countries faced at least one crisis within our sample period and a total of 78 crises episodes (24 severe ones) have been observed in these countries. Lastly, 38 low-income countries are included in our empirical analysis and all but one country have gone through at least one crisis episode. In total, these low-income countries have experienced 96 crises episodes, being 27 severe ones.

## **2 The Behavior of Capital Flows by Foreign and Domestic Agents**

In this section, we study the behavior of gross capital flows over the past decades for our sample economies. Figures 1 and 2, as mentioned above, suggest a strong comovement between inflows by foreigners and outflows by domestic agents, i.e. increases in *CIF* tend to be accompanied by increases in *COD*. Furthermore, the graphs suggest that this correlation seems to hold in both tranquil and turbulent periods, when a retrenchment in flows is observed. In the rest of this section, we formalize this intuition and document the joint behavior of *CIF* and *COD*.

Table 1 presents some summary statistics. Gross capital flows, measured as a percentage of

output, have increased over time around the world. Confirming the trends seen in Figures 1 and 2, these increases suggest a broad process of financial globalization with capital flows increasing for both domestic and foreign agents, and especially so for high- and middle-income countries. For example, *CIF* increases from about 4.8 percent (0.8 percent) of trend GDP for the median high-income (middle-income) country in the 80s to more than 15 percent (5 percent) of trend GDP in high-income (middle-income) economies in the 2000s. Similar patterns are observed for *COD*. In particular, for developing countries, a noticeable and larger increase in the value of *COD* takes place during the 2000s. Nevertheless, there is no clear evidence of such a positive trend in net capital flows. If anything, they have decreased over time for both high- and low-income countries.

Table 1 also shows that over time the volatility of gross capital inflows has increased significantly more than that of net capital flows. For high-income countries, the median standard deviation of *CIF* (*COD*) is 9.1 (8.1) percent of trend GDP during the 2000s, compared to 2.6 (2.3) during the 1970s. In middle- and low-income countries the increase in the volatility of gross flows is less pronounced. For example, the median standard deviation of *CIF* is 4.9 percent of trend GDP for middle-income countries in the 2000s, compared to 3.07 during the 1970s. In low-income countries, an even less pronounced trend is observed. The standard deviation of *COD* (*CIF*) goes from 2.1 (3.3) in the 1980s to 3.4 (3.9) in the 2000s.

These statistics indicate that the volatility of gross capital flows is larger for high-income countries than for middle-income countries in recent decades. These patterns stand in contrast with the well-known fact that net capital flows are more volatile in developing countries, which is also observed in our analysis. The median standard deviation of net capital flows is 3.9 and 5.6 for high- and middle-income countries, respectively, over the entire sample period. In contrast to the observed patterns in gross capital flows, the volatility of net capital flows has remained relatively

stable over the past three decades for countries across all income levels. Thus, the standard deviation of net capital inflows in middle income countries was 3.9 during the 70s, increasing to 4.2 in the 90s, and declining back to 3.9 in the 2000s. In high- and low-income countries, the volatility of flows has increased slightly over time. In low-income countries, the standard deviation of net flows was 4.1 percent of trend GDP in the 80s and reached 4.4 in the 2000s.

These statistics suggest that not only gross capital flows are increasingly larger, but they are increasingly more volatile, and increasingly so, than net capital flows. This is the case for high-income countries over the whole sample and for middle-income countries in the 2000s. As shown in Table 1, the median standard deviation of *COD* and *CIF* for high-income (middle-income) countries is 8.1 and 7.8 percent of trend GDP, respectively, a much larger statistics than standard deviation of net flows, 3.9 percent of trend GDP. If we consider only the 2000s, the differences are even larger. In middle-income countries, the standard deviation of net flows is also smaller than that of gross capital flows by both foreigners and domestic agents in the last decade. However, before the 2000s, the volatility in net capital flows was actually higher than the volatility of its disaggregated components. Likely reflecting the more closed capital accounts and greater restrictions on foreign investments by domestic agents in those countries, especially in the first half of our sample, the volatility of net flows is larger than that of gross capital flows throughout our entire sample for low-income countries.

These patterns suggest an increasing importance of gross capital flows in the 2000s. Figure 3 further illustrates how gross flows have increased over time while net capital flows have remained relatively stable. The figure shows ellipses corresponding to the bivariate Gaussian distribution of *COD* and *CIF*. Each ellipsis summarizes the distribution of the observations (one per country-year) during each one of the last three decades. The ellipses are centered at the mean of

these variables and their shape is given by their covariance matrix. The main axes of the ellipses are given by the first and second principal components of the covariance matrix, while the boundaries of the ellipses capture two standard deviations, hence encompassing 86% of the total probability mass. An increase in size in these ellipses along the inverted 45-degree line shows an increase in gross capital flows, whereas the distance between the boundaries of the ellipsis and this inverted 45-degree line indicates the magnitude of net capital flows. Notice that the inverted 45-degree line in Figure 3 captures country-year observations in which net capital flows are zero, i.e.  $COD$  is equal to  $CIF$ . Thus, Figure 3 shows that capital flows by both foreigners and domestic agents have increased steadily over time, and especially so in the 2000s, while net flows have not changed considerable over time.

Our results so far support a generalized process of financial globalization with capital flows by both foreign and domestic agents increasing significantly over time, particularly since the 1990s. We next assess whether this suggested positive correlation between  $CIF$  and  $COD$  indeed holds when performing a cross-country and time-series comparison over the four decades under study. More formally, we estimate the following regressions:

$$CIF_{c,t} = \alpha + \beta \cdot COD_{c,t} + Controls + \varepsilon_{c,t}, \quad (1)$$

$$COD_{c,t} = \alpha + \beta \cdot CIF_{c,t} + Controls + \varepsilon_{c,t}, \quad (2)$$

where *controls* stand for additional control-variables such as country-trends. To prevent the estimates from being driven by individual countries,  $CIF$  and  $COD$  are not only scaled by trend GDP, but also further standardized by de-meaning and scaling by their corresponding standard deviations on a country by country basis. The results are reported in Table 2, where countries are once more split in our three income groups. We present estimations for the whole sample as well as for each of the decades under analysis.



The estimations provide robust evidence that *CIF* is positively correlated with *COD*. In other words, when foreigners invest in a country, its domestic agents invest abroad. Such a positive correlation generates an expansion in financial globalization, in which a country's international assets and liabilities expand. Conversely, when foreign capital leaves, domestic capital placed abroad is repatriated. In other words, a *retrenchment* in gross capital flows is observed. In line with the graphical evidence, the positive comovement between gross capital flows has increased over time, as the magnitude of the coefficients increase. Moreover, the estimated coefficient increases with countries' income level. The estimated coefficient for low-income countries is 0.27, while the same parameter is 0.44 for middle-income countries and 0.78 for high-income countries.<sup>13</sup>

In sum, the evidence in this section suggests that capital flows by domestic and foreign agents have become increasingly large and volatile, surpassing the size and, in most cases, the volatility of net capital flows. Furthermore, *CIF* and *COD* are positively correlated. In other words, there are periods of *globalization* and periods of *retrenchment*. We investigate next the cyclical properties of gross capital flows and their behavior around financial crises.

### **3 The Cyclical Behavior of Gross Capital Flows**

In the previous section, we showed that capital inflows by foreigners and outflows by domestic agents are positively correlated. In this section, we explore the cyclical properties of gross capital flows by analyzing the behavior of *CIF* and *COD* over the business cycle and around crises. We provide empirical evidence that periods of financial globalization tend to occur during economic expansions and retrenchment periods tend to occur during contractions or crises.

#### **3.1 Gross Capital Flows over the Business Cycle**

To analyze the cyclical properties of gross capital flows, we estimate the following equations:

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<sup>13</sup> Similar estimates are obtained if a different set of controls is used. If year dummies are included the results are qualitatively similar, although point estimates decrease, suggesting the presence of systemic or aggregate effects.

$$Y_{c,t} = \alpha + \beta \cdot X_{c,t} + Controls + \varepsilon_{c,t}, \quad (3)$$

where  $Y_{c,t}$  stands for *CIF*, *COD*, or a measure of aggregate flows, *CIF+COD*;  $X_{c,t}$  represents either net capital flows, the trade balance in goods and services, or a measure of GDP fluctuations; and *controls* stand for additional control variables such as country-trends, as above. In these regressions, net capital flows are calculated using the standardized versions of *CIF* and *COD*. The trade balance in goods and services is also scaled by trend GDP, demeaned and standardized by their standard deviations at the country level.<sup>14</sup> Our measure of business cycles is based on real GDP in constant units of local currency.<sup>15</sup> More specifically, we consider the growth rates in real GDP, which should capture accurately the current state of the economy over the business cycle.<sup>16</sup>

The results are reported in Table 3. Net capital inflows are strongly associated with capital inflows by foreigners for all income groups. For high-income countries, they are also strongly correlated with capital outflows by domestic agents. However, such association is not as strong in middle- and low-income countries; where as larger coefficients are estimated for *CIF*. Note that net capital flows are calculated as the difference between *CIF* and *COD*, and are thus, by construction, correlated with our dependent variables. To partly avoid this correlation, we use the trade balance in goods and services as an alternative measure of capital flows to the extent that it captures the other side of the balance of payments. The estimated coefficients confirm the previous results. The trade balance is strongly correlated with capital flows by foreigners, and more so than flows by domestic agents in middle- and low-income countries.

Regarding the dynamics of gross capital flows at the business cycles, we find that gross capital

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<sup>14</sup> The data on the trade balance are from the IMF's *Balance of Payment Statistics Yearbooks*.

<sup>15</sup> Real GDP in constant units of local currency comes from the World Bank's *World Development Indicators*. This information was complemented with data from the IMF's *World Economic Outlook 2009* if the data from the original source were missing.

<sup>16</sup> As an alternative measure of business cycles, we also considered a measure of output gap based on the Hodrick-Prescott filter. The results were qualitatively similar to the ones reported here.

flows expand during good times, while during bad times, they decline. In other words, we find that not only capital flows by foreigners are pro-cyclical. Capital outflows by domestic agents are also pro-cyclical, with domestic agents investing more abroad in good times when the economy is above potential or is growing in real terms. As a consequence, as shown by the estimated coefficients on *CIF+COD*, expansions in financial globalization, in which a country's international assets and liabilities expand, are observed during good times. Analogously, during downturns in economic activity, there is retrenchment in gross capital flows.

Furthermore, the evidence in Table 3 expands the widely-documented pro-cyclicality of net capital inflows. During booms, foreigners increase their purchases of domestic assets and domestic agents augment their investments abroad. These patterns suggest that changes in net capital inflows are driven mostly by foreigners in developing economies; with domestic agents' behavior being most relevant for the behavior of net flows in high-income countries.

### **3.2 Gross Capital Flows during Crises**

We start by providing some descriptive statistics comparing the behavior of *CIF* and *COD* during turbulent and tranquil periods. Turbulent periods are defined as those falling within a five-year window around each crisis episode. As shown in Table 4, both capital inflows by foreigners and capital outflows by domestic agents decline during turbulent periods for countries from all income groups. For example, *CIF* falls by almost 50 percent for high-income countries while *COD* decreases by about 65 percent. Similarly, declines between 40 and 50 percent of trend GDP in gross capital flows are observed in low-income countries. In middle-income countries, the retrenchment in gross capital flows is even stronger – *CIF* decline from inflows of 7.2 percent of trend GDP to actual outflows of 2.6 percent of trend GDP and *COD* go from outflows of 6.5

percent of trend GDP to inflows of 2.6 percent of trend GDP.<sup>17</sup>

Despite the similarities in the dynamics of gross capital flows among countries from all income levels, the behavior of net capital flows is rather contrasting. While net capital inflows increase during crises for high-income countries, middle- and low-income countries face a decline in net capital inflows. This evidence suggests that retrenchment by domestic agents is stronger than that of foreigners in high-income countries but weaker in developing economies.

More formally, an event study analysis of gross capital flows around crises reinforces this evidence. We focus on the dynamics of *CIF* and *COD* not only during the crisis year, but also in its run-up and immediate aftermath by analyzing the preceding and following two years. We estimate the following equation:

$$Y_{c,t} = \alpha + \sum_{i=-2}^{i=2} \beta_i \cdot Crisis_{c,t+i} + Controls + \varepsilon_{c,t}, \quad (4)$$

where  $Y_{c,t}$  stands for our standardized measures of *CIF* or *COD*; *Crisis* is the composite crisis indicator; and *controls* capture the additional control variables such as country-trends.<sup>18</sup> Once more, we perform the analysis by pooling countries according to their income level.

The estimates are presented in Table 5 and Figure 4. They provide robust evidence of a retrenchment in capital flows by both foreign and domestic agents for countries from all income groups. In particular, both *CIF* and *COD* are negative and statistically different than zero in the crisis year for countries in all income groups but for *CIF* in high-income countries. Table 5 also presents Wald tests that check if the behavior of flows in the crisis year or in the immediate aftermath was significantly different from the one observed in the run-up. Thus, Wald tests show the decline in capital inflows by foreigners and capital outflows by domestic agents in the crisis

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<sup>17</sup> To the extent that official flows are unlikely to decline during crises, the milder reaction of capital flows in low-income countries if compared to middle-income ones might be explained by the relative size of these flows.

<sup>18</sup> We report results with country-trends as controls only, but our results are qualitatively similar if we add year dummies as controls as well.

year in comparison to the average flow in the previous two years is statistically significant for all income levels, including *CIF* in high-income countries. Furthermore, the Wald Tests show that gross capital flows remained at depressed levels, or declined even further, during the two-year period after the onset of the crisis.

Figure 4 shows that the median retrenchment in gross capital flows around crises is rather large. For instance, *CIF* in high-income countries on average decline from inflows of 5.5 percent of trend GDP in the pre-crisis year to outflows of 4.3 percent in the first post-crisis year. In middle-income countries, these flows reverse from 0.4 to -2.5 percent of trend GDP over the same period. In low-income countries, *CIF* declines from around 0.2 percent of trend GDP in the two years preceding the turmoil period to around -1.7 percent of trend GDP in the year following the onset of the crisis. Similar numbers are estimated for *COD*.

The analysis so far has included the global financial crisis that hit countries in 2008. However, the empirical evidence in Milesi-Ferretti and Tille (2010) suggests that this latest crisis has been marked by a significant decline in capital flows around the world. A re-estimation of equation (4) around this episode, reported in the top panel of Table 6, reproduces their findings. The Wald tests suggest a significant retrenchment in capital flows during in 2008 and the following year in comparison to the pre-crisis period from all income groups. To the extent that this single event might be driving our results, as a robustness exercise, we re-estimate our event study analysis excluding the 2008 financial crisis. The results are reported in the bottom panel of Table 6.

Our previous results stand and remain statistically and economically significant. Both *CIF* and *COD* decline significantly in the crisis year and, according to Wald tests, are statistically smaller than their average during the preceding two years. Also consistent with our previous results, gross capital flows during the post-crisis period remain at depressed levels in comparison to the run up to

the crisis event. In sum, the results in Table 6 show that the behavior of foreigners and domestic agents during the recent financial crisis is in line with their behavior during previous crisis episodes, with estimates confirming a generalized retrenchment of gross capital flows around these events. Hence, for the remainder of the paper, we proceed with the analysis of the data based on our entire sample period, from 1970 to 2009.

Thus far we have considered a single crisis indicator that pools together several types of financial crisis for a particular country in a given year. We extend this analysis by considering the intensity of the turmoil episodes and distinguishing mild and severe crisis episodes.<sup>19</sup> In particular, as described in Section 2, we classify crisis events into: *one crisis* episodes, in which a country experiences the beginning of one, and only one, type of crisis in a given year; and *more than one crisis* episodes, in which a country faces the beginning of more than one type of crisis within a given year. We estimate the following equation, which adapts equation (4) to these two indicators:

$$Y_{c,t} = \alpha + \sum_{i=-2}^{i=2} \beta_{1,i} \cdot \text{One Crisis}_{c,t+i} + \sum_{i=-2}^{i=2} \beta_{2,i} \cdot \text{More One Crisis}_{c,t+i} + \text{Controls} + \varepsilon_{c,t}, \quad (5)$$

where  $Y_{c,t}$  stands for our standardized measures of *CIF* or *COD*; *one crisis* corresponds to the *one crisis* indicator; *more o ne crisis* stands for the *more than one crisis* indicator; and *controls* capture additional control variables such as country-trends. The estimated equations are reported in Table 7 and Figure 5.

The results suggest a significant retrenchment in gross capital flows both by domestic and foreign agents around both mild and severe crisis episodes for all income groups. During *one crisis* episodes, *CIF* and *COD* decline at the onset of the crisis as well as in its aftermath, and even more

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<sup>19</sup> De Paoli et al. (2009) show that twin crises feature larger output losses than milder episodes.

so for high-income countries, if compared to the two years before the crisis. Similar statistically significant results are found around *more than once crisis* episodes. Wald tests reported in Table 7 show that *CIF* and *COD* are significantly smaller in the crisis year relative to the pre-crisis average for countries from all income groups in our sample. The results however suggest that the retrenchment of domestic agents in the aftermath of severe crises is more short-lived and reversed during the following two years. Wald tests reject that *COD* is statistically different in the aftermath of the turmoil episode if compared to its pre-crisis values.

This retrenchment in gross capital flows is not only statistically but also economically significant as shown in Figure 5. In high-income countries, *CIF* reversers from 5.2 percent of trend GDP in the year preceding *one crisis* episodes in the average country to less than -4.4 percent of trend GDP in the first year after the onset of the crisis, suggesting a collapse in flows of over 9 percentage points. Domestic agents behave similarly during these episodes. This retrenchment in gross capital flows around mild crisis episodes is also large in middle-income countries, where a decline of almost 4 percentage points takes place on average during the five-year window around mild crisis episodes, and slightly milder in low-income countries, with declines of about 1 percentage point of trend GDP over the same period. During *more than one crisis* episodes, similar patterns are observed. Capital inflows by domestic agents decline from 15.7 percent of trend GDP in high-income countries to about 4 percent in the aftermath of the crisis year, implying a collapse of flows of about 11.5 percentage points. In middle-income countries, *COD* declines around 5 percentage points of trend GDP in the crisis year if compared with the previous two years. Once more, a milder decline of 2 percentage points over the same period is observed in low-income countries.

Notice that these plots also highlight that the reaction of domestic and foreign agents might be

stronger in severe crisis episodes. *More than one crisis* episodes lead to significant retrenchment in capital flows by foreign and domestic agents during the crisis year and by foreign agents in the following two years. Wald tests reported in Table 7 shows that this graphical evidence is statistically significant for middle- and low-income countries.<sup>20</sup>

Overall, the results reported in Table 7 and Figure 5 show that the retrenchment in gross capital flows takes place not only around severe crises but also around mild ones. Furthermore, these estimations suggest that such a retrenchment by domestic and foreign agents is indeed a stylized fact regarding the dynamics of gross capital flows during crises.

### **3.3 The Dynamic Behavior of the Subcomponents of Gross Capital Flows during Crises**

We now analyze whether a particular flow type is driving the dynamics of capital flows around crises or the observed patterns are widespread across all flow types. First, we discuss their relative size and their evolution over the past decades.

A decomposition of gross flows into portfolio investment flows, other investments, and direct investment flows suggest that their composition varies across income levels. Table 8 presents some summary statistics. In high-income countries, other investment flows are the largest subcomponent of both *CIF* and *COD*, representing almost a 50 percent and a 40 percent respectively. In contrast, in developing countries around half of the *CIF* take the form of direct investments. For example, the median middle-income (low-income) country received FDI of 2.2 (2.5) percent of trend GDP in comparison to portfolio investments of 0.6 (0.06) percent and other investments of 1.6 (1.9) percent. On the other hand, international reserves represent 46 (58) percent of *COD* in middle-income (low-income) countries.

The striking increase in gross capital flows over time is also evident in Table 8. Nevertheless, it

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<sup>20</sup> The test results for high-income countries are less robust probably because of the low number of severe episodes, only five in our sample.



has not taken place across all types of flows. Other investment flows capture the bulk of the increase in CIF in high-income countries, whereas FDI flows have increased the most for developing countries since the 1990s. If anything, in low-income countries, other investment flows by foreign agents have actually decreased since the 80s. Regarding COD, other investment flows have increased considerably in the last decade for all income groups. Still, for developing countries, the expansion of international reserves explains a large part of the increase in *COD*.

In sum, these summary statistics suggest that the dynamics of gross capital flows around crises might be driven by different types of flows in different income groups.<sup>21</sup>

In order to assess the relevance of the various flow types on the dynamics of aggregate gross capital flows during periods of financial distress, we re-estimate equation (5) separately for each component of *COD* and *CIF*. The results for high-, middle-, and low-income countries are reported in Tables 9A through 9C, respectively. The estimations suggest strongly asymmetric effects across both components of capital flows and income levels.

The results on the different components of *CIF* reflect partly the relative size of the different flows. The statistically significant retrenchment in other investment flows by foreigners during both mild and severe episodes is a regular pattern for countries from all income groups. Nevertheless, contrasting patterns arise for other flow types. For instance, while portfolio debt inflows decline during the post-crisis periods of both mild and severe crises in high- and low-income countries; in middle-income countries, these inflows remain relatively stable within our five-year windows around *one crisis* episodes, but significantly retrenchment around severe

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<sup>21</sup> Also the evidence on the volatility of the different types of flows sheds light on their dynamics. Other investment flows by foreigners are the most volatile flow type for all income levels. This stands in contrast to existing perceptions that portfolio flows are the most volatile type of flow. In fact, the volatility of these flows is similar across high- and middle income countries. Similar patterns are observed for other investment flows by domestic agents. Their standard deviation is larger than that of portfolio outflows or direct investments abroad for all income groups. International reserves nevertheless are slightly more volatile in developing countries.

episodes. Furthermore, portfolio equity inflows do not retrench considerably in middle-income countries around severe crisis episodes, whereas they actually decline in high- and low-income countries. During mild episodes, these flows retrench in high- and middle income but not in low-income countries. Lastly, foreign direct investments decline only in response to mild crisis episodes, remaining relatively stable, or even increasing, during severe crisis episodes in high-income countries. In contrast, FDI inflows are relatively stable during mild crises in low-income countries and tend to decline during severe crises. Middle-income countries are somewhere in between, with significant declines during both mild and severe crisis episodes. Overall, portfolio debt inflows and other investment inflows drive most of the retrenchment in *CIF* during *more than one crisis* episodes, especially in high- and middle-income countries. The patterns for *one crisis* events are more diffuse, varying among income levels, though other investment flows still play a significant role.

Regarding the different components of *COD*, the differences across countries are even more striking. In high-income countries, all flow types but those related to international reserves retrench around *one crisis* episodes, international reserve flows retrench significantly in middle-income countries. During *more than one crisis* episodes, international reserves decline in both low- and middle-income countries. The retrenchment by domestic agents in middle- and low-income countries is, however, not concentrated in international reserves. For middle-income countries, there is also a significant decline in direct investments abroad and portfolio outflows during severe crises episodes and a retrenchment in portfolio equity and other investment outflows during mild crisis episodes. In contrast, low-income countries face only a decline in other investment outflows in severe crises years. During mild crisis, there is a weak decrease in portfolio equity and other investment outflows. In sum, while high-income countries do not sell their

international reserve assets during turbulent periods, less developed countries, and especially middle-income ones, make a buffer use of international reserves. Other investment outflows and direct investment abroad are the other flow types mostly driving the aggregate dynamics of *COD*.

In this section, we have shown that periods of financial globalization are associated with economic expansions, while periods of retrenchment in capital flows by foreigners and domestic agents are related to downturns and financial crises. These results shed light not only on the source of shocks affecting economic activity (e.g. productivity, terms of trade) but also on the mechanisms behind financial crises as well as the market frictions affecting agents in these countries. These issues are discussed in greater detail in the next section.

#### **4 Interpreting the Evidence**

In this section, we contrast the evidence presented in the previous sections with the predictions of different theories of capital flows. On the one hand, there is a growing literature in international macro-finance that brings portfolio choice and asset pricing considerations into dynamic stochastic general equilibrium models of international macroeconomics. These models have so far emphasized productivity shocks as the main source of fluctuations in economies open to capital flows. Most of these papers have focused on the long-run composition of international portfolios.<sup>22</sup>

Two recent contributions that emphasize the high-frequency behavior of international portfolios are Hnatkovska (2010) and Tille and van Wincoop (2010). Both document that in the United States there is a positive correlation between domestic purchases of foreign equity and foreign purchases of domestic equity and present DSGE models that can account for this

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<sup>22</sup> See Kraay and Ventura (2000), Evans and Hnatkovska (2005), Kraay et al. (2005), Coeurdacier, Kollmann, and Martin (2010), Devereux and Sutherland (2010 and forthcoming), and Pavlova and Rigobon (2010a). Pavlova and Rigobon (2010b) present a survey.

correlation.<sup>23</sup> Hnatkovska (2010) uses a preponderance of productivity shocks in the nontradable sector to explain this correlation. Her model is also consistent with our evidence that gross capital flows are pro-cyclical. Tille and van Wincoop (2010) show that, even in a model with a single good, productivity shocks can account for the positive correlation of gross capital flows. However, their model also predicts that gross capital flows should be counter-cyclical, that is domestic (foreign) investors should invest less abroad (at home) in good times, which is inconsistent with the evidence presented here.

Our take is that, although it is possible to construct models in which productivity shocks lead to a positive correlation of gross capital flows, this is not the most natural effect of productivity shocks. As a result, such models are likely to have a hard time matching other important features of the data. For example, the preponderance of productivity shocks in the nontradable sector suggested by Hnatkovska (2010) is likely to imply counter-cyclical real exchange rates, as the abundance of nontradable goods during booms reduces their price. If booms are associated with a positive shock to the endowment of nontradable goods, then the price of nontradable goods relative to tradable ones will likely be low in booms. In other words, the real exchange rate will be depreciated in booms. In reality, real exchange rates are appreciated in booms and depreciated in recessions. So cycles mostly due to shocks in the nontradable sector seem not too promising. More broadly, our empirical evidence seems inconsistent with crises affecting foreign and domestic agents symmetrically.

Instead, we interpret the evidence presented in this paper as suggesting that crises affect foreign and domestic agents differently. One set of models that can account for our evidence are those based on asymmetric information between domestic and foreign agents. One such model is presented by Dvorak (2003), who shows that a model with asymmetric information can account

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<sup>23</sup> Dvorak (2003) presents similar evidence.

for the positive correlation between domestic purchases of foreign equity and foreign purchases of domestic equity. Interestingly, he shows that to account for this correlation it is also necessary to assume the existence of asymmetric information within countries. Brennan and Cao (1997) show that retrenchment during crises can take place if foreign agents are less informed than domestic agents about the return of domestic assets and crises increase this informational asymmetry.<sup>24</sup>

Another set of models that can account for our evidence are those in which asset returns depend on the residence of the holder of the asset. For example, in models based on sovereign risk domestic agents are less likely to be defaulted on than foreign agents. This is so because residents' welfare enters directly in the objective function of the government, creating incentives to favor residents vis-a-vis foreigners. Such models can easily account for retrenchment during crises in which the probability of default increases disproportionately on foreign holders of domestic agents. Broner, Martin, and Ventura (2010) explore in detail this mechanism in a model in which assets can be re-traded in secondary markets. More generally, retrenchment during crises is likely to be consistent with all models in which crises are associated with a relative deterioration of foreigners' property rights.

## 5 Conclusions

This paper provides a number of important stylized facts on the dynamic behavior of gross capital flows by domestic and foreign agents. We have shown that: (i) while the volatility of gross capital flows has increased over time, this increase has not translated in the same magnitude into more volatile net capital flows, since *CIF* and *COD* are highly positively correlated; (ii) gross capital flows are pro-cyclical, with *CIF* and *COD* increasing during expansions; (iii) total gross capital flows retrench significantly during crises, especially severe ones, and during economic

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<sup>24</sup> A related point is made by Tille and Van Wincoop (2008).

downturns; and (iv) the behavior of gross capital flows during crises is not driven by a single component, although international reserves play an important role in middle- and low-income countries and debt flows play an important role in advanced and middle-income countries.

The identified behavior of gross capital flows allow us to shed light on the sources of fluctuations for international capital flows and evaluate the adequacy and pitfalls of the most recent and relevant theories on this issue. In particular, we find no evidence that, on average, gross capital flows are driven by fire sales of domestic assets to foreigners and/or domestic capital flight. The evidence also runs contrary to the view that capital flows are driven mostly by productivity shocks, since such shocks would generally imply a similar behavior by foreigners and domestic agents towards domestic assets. Instead, the evidence suggests that crises affect foreigners and domestic agents asymmetrically. If, for example, crises were associated with a worsening of investor property rights or an increase in informational asymmetries that affected foreign creditors more than domestic creditors, we would expect the type of retrenchment observed in the data.

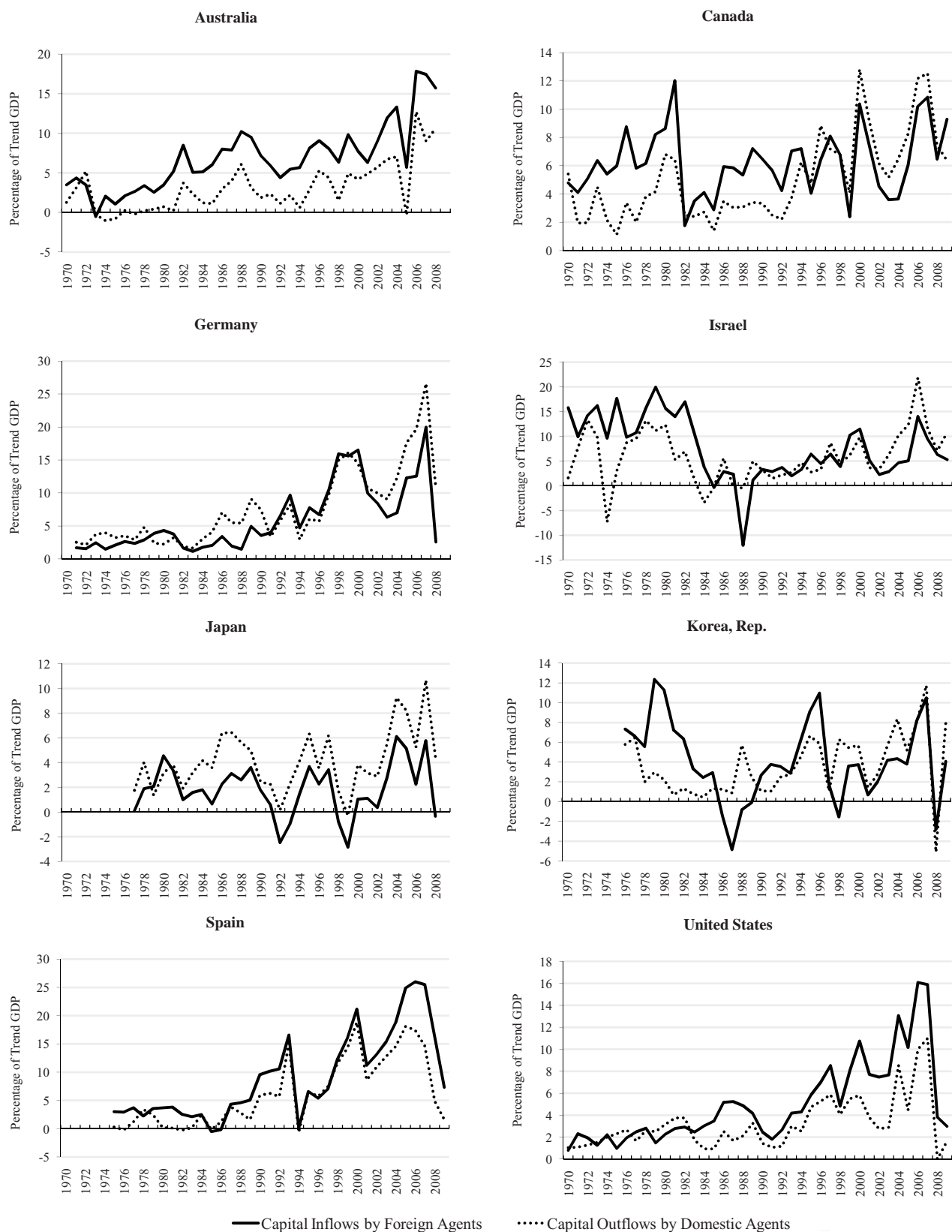
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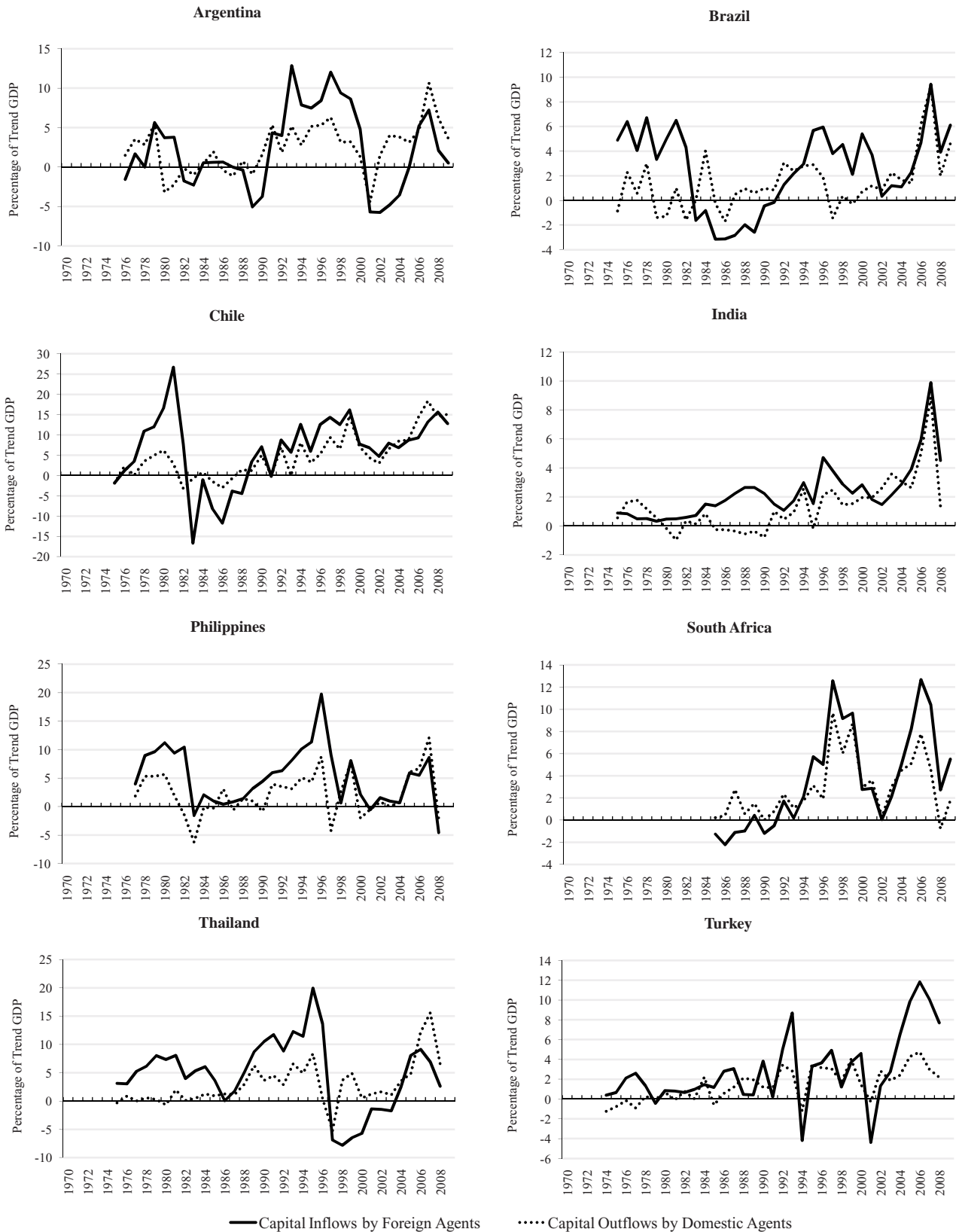


**Figure 1**  
**Capital Flows in High-Income Countries**



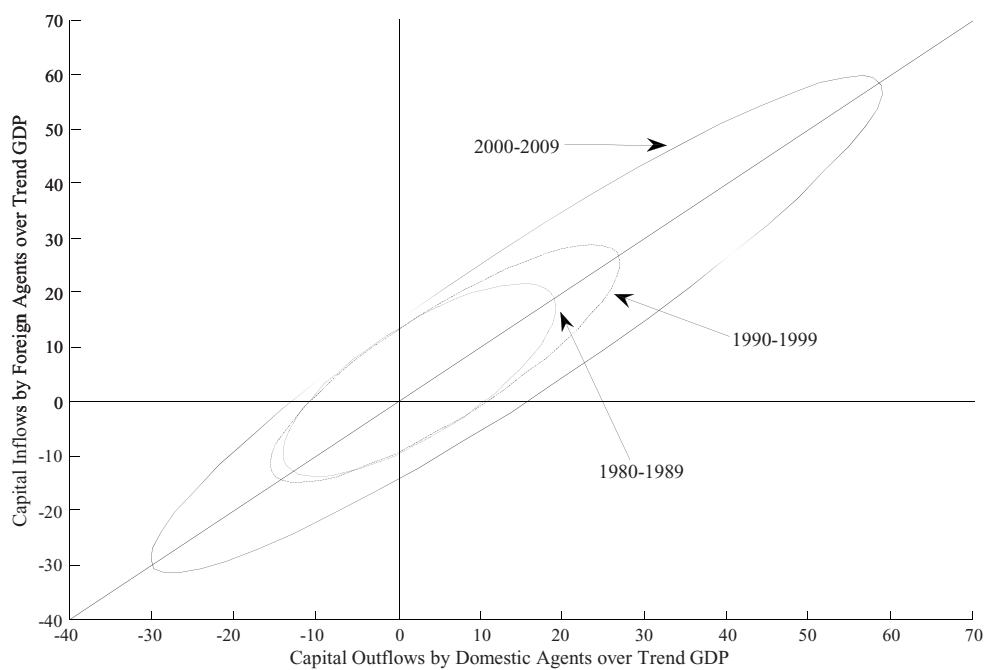
The figure shows the evolution of capital inflows by foreign agents (CIF) and capital outflows by domestic agents (COD) as a percentage of trend GDP for a select sample of high-income countries from 1970 until 2009.

**Figure 2**  
**Capital Flows in Low- and Middle-Income Countries**



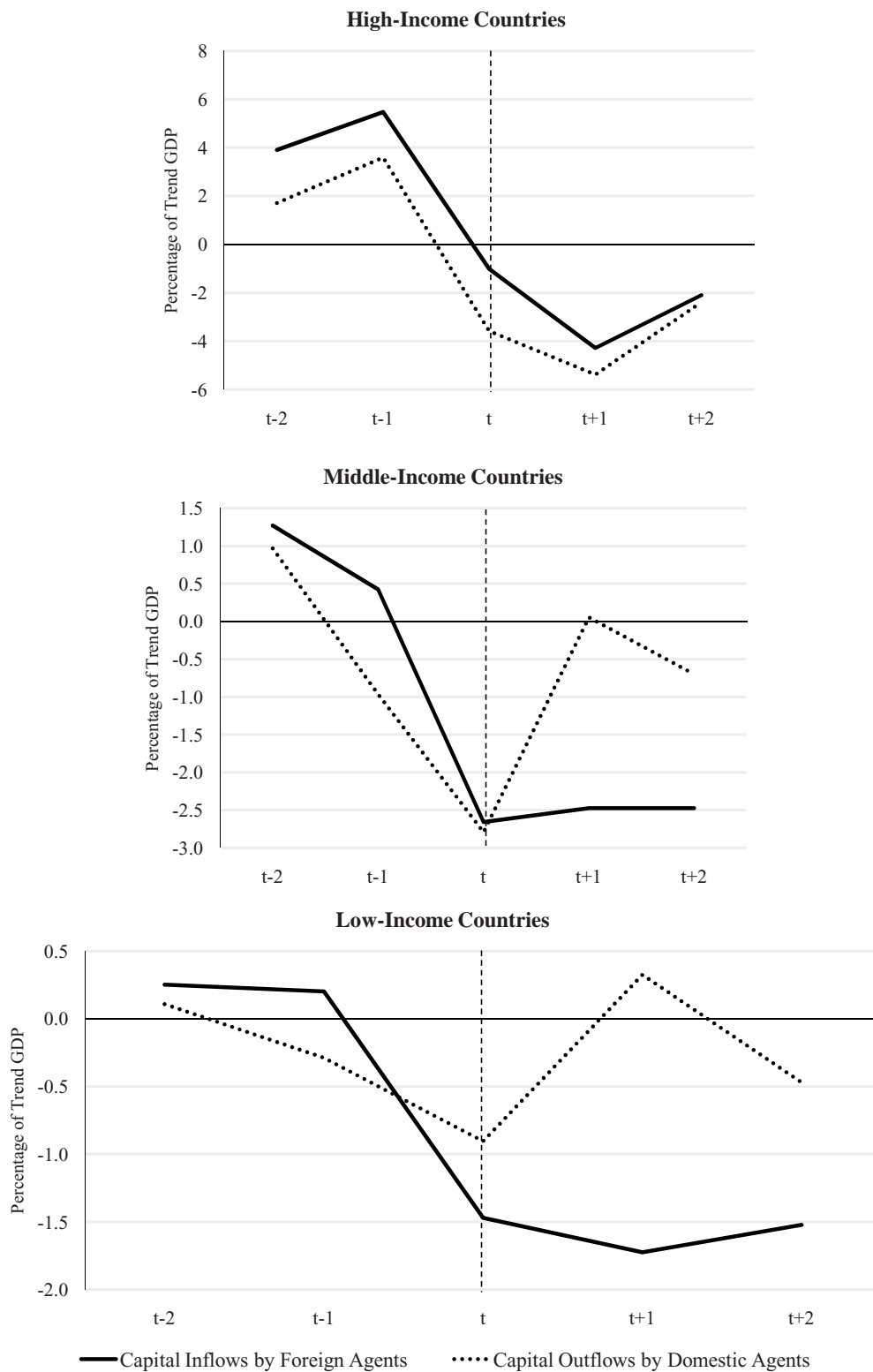
The figure shows the evolution of capital inflows by foreign agents (CIF) and capital outflows by domestic agents (COD) as a percentage of trend GDP for a select sample of middle-income countries from 1970 until 2009.

**Figure 3**  
**Joint Distribution of Capital Flows**



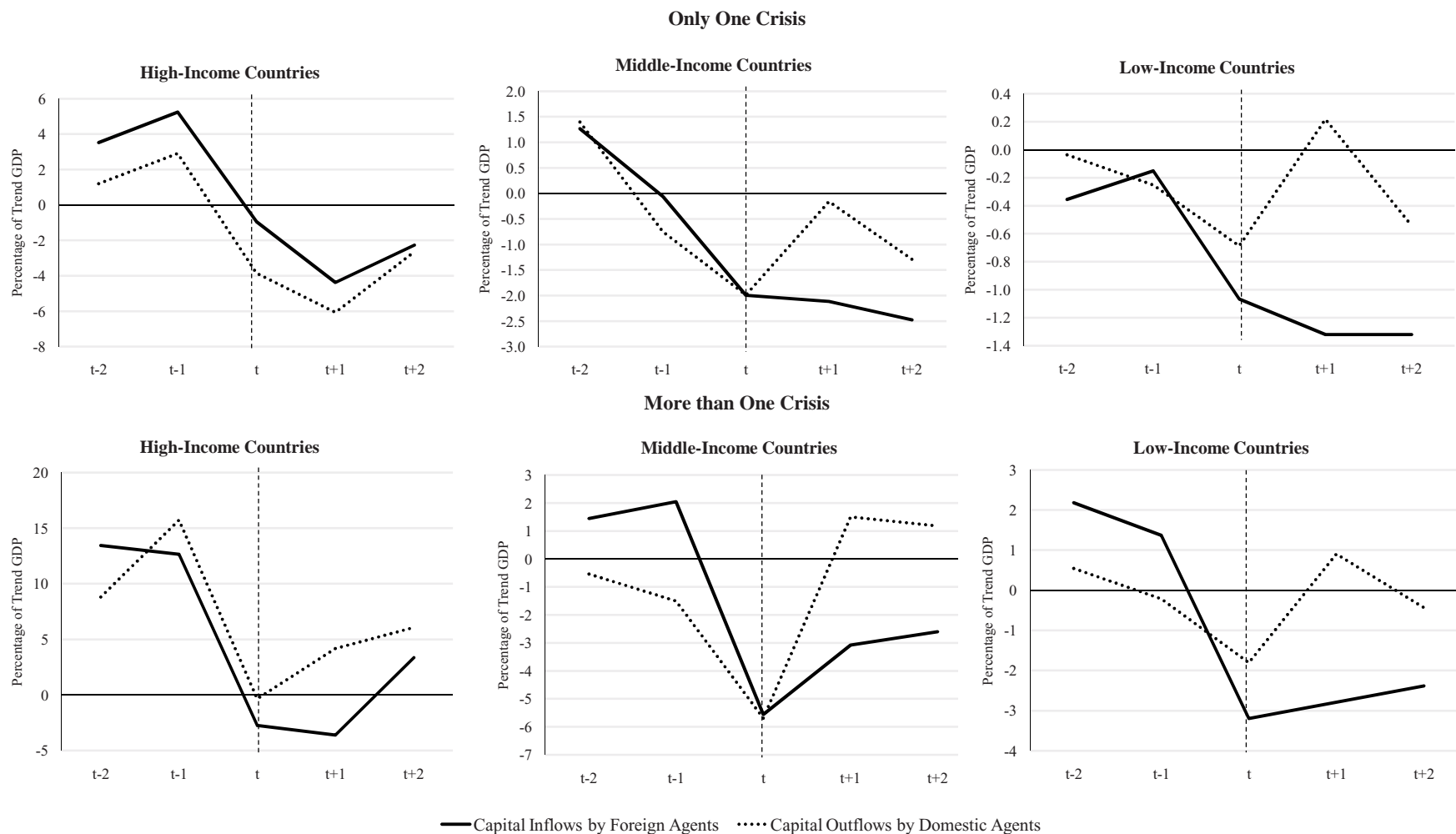
The figure shows ellipses that account for the joint distribution of capital flows by foreign and domestic agents. One ellipsis for each decade is reported. Each ellipsis captures 103 points and each one point represents the average for that decade for a country in our sample. Capital flows are scaled by trend GDP.

**Figure 4**  
**Capital Flows around Crises**



The figure shows the economic significance of the regression coefficients in the event study analyses of capital inflows by foreign agents (CIF) and capital outflows by domestic agents (COD) around five-year windows of crisis periods. These regressions are reported in Table 5. The economic significance is defined as the product of the estimated coefficient and the median one standard deviation of the non-standardized version of the dependent variable across countries with at least one crisis during the period of analysis. Capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by the standard deviation at the country level. The sample period is from 1970 to 2009.

**Figure 5**  
**Capital Flows around Crises of Different Intensities**



The figure shows the economic significance of the regression coefficients in the event study analyses of capital inflows by foreign agents (CIF) and capital outflows by domestic agents (COD) around five-year windows of crisis periods. These regressions are reported in Table 6. Crisis events are divided into One Crisis periods and More than One Crisis periods, according to their intensity. The economic significance is defined as the product of the estimated coefficient and the median one standard deviation of the non-standardized version of the dependent variable across countries with at least one crisis during the period of analysis. Capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by the standard deviation at the country level. The sample period is from 1970 to 2009.

**Table 1**  
**Capital Flows: Summary Statistics**

	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	Median Average	Median Std. Dev.	Median Average	Median Std. Dev.	Median Average	Median Std. Dev.
<b>Net Capital Flows (CIF - COD)</b>	0.64	3.92	1.29	5.62	2.08	5.51
<b>1970s</b>	1.64	2.41	3.37	3.94	3.54	3.09
<b>1980s</b>	1.42	2.71	0.39	5.56	2.71	4.11
<b>1990s</b>	0.87	2.79	0.82	4.23	1.28	4.18
<b>2000s</b>	-0.18	3.60	1.90	3.94	0.56	4.37
<b>Total Gross Capital Flows (CIF + COD)</b>	17.67	15.49	9.31	10.01	6.97	7.17
<b>1970s</b>	9.50	3.62	7.01	5.27	7.92	2.75
<b>1980s</b>	9.10	6.16	1.96	5.95	4.86	3.90
<b>1990s</b>	13.56	9.39	7.80	5.60	7.21	5.56
<b>2000s</b>	32.65	16.70	15.06	8.48	8.41	6.21
<b>Capital Inflows by Foreign Agents (CIF)</b>	8.89	7.81	4.83	6.06	4.07	5.21
<b>1970s</b>	4.73	2.66	5.08	3.07	5.62	2.29
<b>1980s</b>	4.79	3.47	0.83	4.03	3.99	3.37
<b>1990s</b>	7.00	5.54	3.96	4.12	4.43	4.16
<b>2000s</b>	15.16	9.16	5.58	4.96	4.22	3.93
<b>Capital Outflows by Domestic Agents (COD)</b>	8.33	8.05	3.78	5.10	2.87	3.87
<b>1970s</b>	3.43	2.29	3.34	2.96	2.07	1.77
<b>1980s</b>	3.78	3.09	1.40	2.71	0.54	2.06
<b>1990s</b>	6.56	5.32	2.80	3.32	2.54	3.03
<b>2000s</b>	17.71	8.13	6.44	4.86	3.73	3.35
<b>No. of Countries</b>	39		26		38	

The table shows summary statistics of capital flows by both foreign and domestic agents as well as net capital flows and total gross capital flows. The median value of country averages and of country standard deviations of capital flows over trend GDP are shown. The sample period is from 1970 to 2009.

**Table 2**  
**Correlation between Capital Flows**

	High-Income Countries				Middle-Income Countries				Low-Income Countries			
	1980s	1990s	2000s	Whole Sample	1980s	1990s	2000s	Whole Sample	1980s	1990s	2000s	Whole Sample
<b>COD = <math>\beta</math>*CIF (a)</b>	0.48 ** [0.20]	0.83 *** [0.08]	0.93 *** [0.04]	0.78 *** [0.05]	0.28 [0.17]	0.23 *** [0.08]	0.65 *** [0.07]	0.44 *** [0.07]	0.09 [0.06]	0.38 *** [0.09]	0.31 *** [0.07]	0.27 *** [0.06]
<b>CIF = <math>\beta</math>*COD (b)</b>	0.37 *** [0.12]	0.68 *** [0.06]	0.92 *** [0.04]	0.75 *** [0.05]	0.25 [0.16]	0.36 *** [0.11]	0.88 *** [0.06]	0.45 *** [0.07]	0.16 [0.12]	0.40 *** [0.10]	0.45 *** [0.10]	0.27 *** [0.06]
<b>Country-Trend Dummies</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>No. of Countries</b>	34	39	39	39	20	26	25	26	29	38	37	38
<b>No. of Observations</b>	338	371	365	1,300	176	237	226	702	277	329	332	1,050
<b>R-squared (a)</b>	0.46	0.68	0.89	0.71	0.45	0.40	0.70	0.36	0.48	0.47	0.46	0.23
<b>R-squared (b)</b>	0.46	0.73	0.89	0.71	0.33	0.23	0.67	0.35	0.17	0.37	0.44	0.23

The table reports fixed-effects panel regressions of capital inflows by foreign agents (CIF) on capital outflows by domestic agents (COD) and COD on CIF by decade, controlling for country-trend effects. Capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by the standard deviation at the country level. The sample period is from 1970 to 2009. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1%, respectively.

**Table 3**  
**Cyclicality in Capital Flows**

	High-Income Countries								
	CIF	COD	CIF+COD	CIF	COD	CIF+COD	CIF	COD	CIF+COD
Net Capital Flows (CIF - COD)	0.25 *** [0.05]	-0.24 *** [0.07]	-0.02 [0.07]						
Trade Balance				-0.25 *** [0.06]	0.19 ** [0.07]	0.00 [0.07]			
GDP Growth							3.58 ** [1.45]	5.20 *** [1.46]	5.17 *** [1.41]
Country-Trend Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	39	39	39	39	39	39	39	39	39
No. of Observations	1300	1300	1300	1300	1300	1300	1287	1287	1287
R-squared	0.34	0.35	0.30	0.33	0.33	0.30	0.31	0.35	0.35
	Middle-Income Countries								
	CIF	COD	CIF+COD	CIF	COD	CIF+COD	CIF	COD	CIF+COD
Net Capital Flows (CIF + COD)	0.63 *** [0.06]	-0.26 ** [0.09]	0.26 ** [0.10]						
Trade Balance				-0.59 *** [0.04]	0.21 ** [0.09]	-0.25 *** [0.08]			
GDP Growth							3.90 *** [0.91]	3.18 *** [0.92]	4.47 *** [0.87]
Country-Trend Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	26	26	26	26	26	26	26	26	26
No. of Observations	702	702	702	702	702	702	681	681	681
R-squared	0.53	0.25	0.28	0.46	0.23	0.27	0.24	0.22	0.27
	Low-Income Countries								
	CIF	COD	CIF+COD	CIF	COD	CIF+COD	CIF	COD	CIF+COD
Net Capital Flows (CIF + COD)	0.72 *** [0.04]	-0.39 *** [0.05]	0.32 *** [0.06]						
Trade Balance				-0.58 *** [0.04]	0.30 *** [0.05]	-0.27 *** [0.05]			
GDP Growth							3.02 *** [0.86]	2.95 *** [0.78]	3.71 *** [0.87]
Country-Trend Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	38	38	38	38	38	38	38	38	38
No. of Observations	1050	1050	1050	1050	1050	1050	1042	1042	1042
R-squared	0.60	0.29	0.23	0.40	0.23	0.20	0.19	0.18	0.18

The table reports fixed-effects panel regressions of capital inflows by foreign agents (CIF), capital outflows by domestic agents (COD), and a measure of aggregate capital flows, CIF+COD, on net capital flows, the trade balance in goods and services, and real GDP growth. All regressions control for country-trend effects. Capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by the standard deviation at the country level. The sample period is from 1970 to 2009. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1%, respectively.



**Table 4**  
**Capital Flows: Tranquil vs. Crisis Periods**

	High-Income Countries	Middle-Income Countries	Low-Income Countries
<b>Net Capital Flows (CIF - COD)</b>			
<b>Non-Crisis Years</b>	-0.18	0.76	1.73
<b>Crisis Years</b>	2.58	-0.02	1.29
<b>Total Gross Capital Flows (CIF + COD)</b>			
<b>Non-Crisis Years</b>	27.53	13.66	8.45
<b>Crisis Years</b>	12.43	-5.21	4.62
<b>Capital Inflows by Foreign Agents (CIF)</b>			
<b>Non-Crisis Years</b>	13.67	7.21	5.09
<b>Crisis Years</b>	7.50	-2.62	2.96
<b>Capital Outflows by Domestic Agents (COD)</b>			
<b>Non-Crisis Years</b>	13.86	6.45	3.36
<b>Crisis Years</b>	4.92	-2.60	1.66
<b>No. of Countries</b>	39	26	38

The table shows average capital flows around crisis and non-crisis periods. Crisis years capture five-year windows around the crisis events, as described in Section 2 of the main text. Non-crisis years capture all the remaining years in the sample. Capital flows are measured as a percentage of trend GDP. The sample period is from 1970 to 2009.

**Table 5**  
**Capital Flows around Crises**

	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	CIF	COD	CIF	COD	CIF	COD
<b>Year t - 2</b>	0.50 *** [0.11]	0.20 [0.13]	0.21 * [0.11]	0.18 * [0.10]	0.05 [0.11]	0.03 [0.11]
<b>Year t - 1</b>	0.70 *** [0.13]	0.42 *** [0.14]	0.07 [0.12]	-0.18 [0.11]	0.04 [0.10]	-0.08 [0.08]
<b>Crisis Year</b>	-0.13 [0.12]	-0.42 *** [0.13]	-0.44 *** [0.12]	-0.52 *** [0.11]	-0.29 *** [0.08]	-0.25 ** [0.09]
<b>Year t + 1</b>	-0.55 *** [0.11]	-0.63 *** [0.15]	-0.41 *** [0.10]	0.01 [0.10]	-0.34 *** [0.10]	0.09 [0.09]
<b>Year t + 2</b>	-0.27 * [0.14]	-0.28 ** [0.12]	-0.41 *** [0.09]	-0.13 [0.08]	-0.30 *** [0.09]	-0.13 [0.09]
<b>One-Sided Wald Tests:</b>						
<b>Crisis Year vs. Avg. Pre-Crisis</b>	-0.73 ***	-0.73 ***	-0.58 ***	-0.52 ***	-0.34 ***	-0.23 *
<b>Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis</b>	-0.92 ***	-0.75 ***	-0.56 ***	-0.21 ***	-0.36 ***	-0.07 *
<b>Country-Trend Dummies</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>No. of Crises</b>	85	85	134	134	158	158
<b>No. of Countries</b>	39	39	26	26	38	38
<b>No. of Observations</b>	1,300	1,300	702	702	1,050	1,050
<b>R-squared</b>	0.35	0.36	0.28	0.24	0.21	0.18

The table reports fixed-effects panel regressions of capital inflows by foreign agents (CIF) and capital outflows by domestic agents (COD) on a five-year window around crisis events, controlling for country-trend effects. Capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by the standard deviation at the country level. One-sided Wald tests comparing pre- and post-crisis periods are also reported. The sample period is from 1970 to 2009. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1% respectively.

**Table 6**  
**Robustness Tables**

<b>Panel A. Capital Flows around 2008</b>						
	<b>High-Income Countries</b>		<b>Middle-Income Countries</b>		<b>Low-Income Countries</b>	
	<b>CIF</b>	<b>COD</b>	<b>CIF</b>	<b>COD</b>	<b>CIF</b>	<b>COD</b>
<b>Year 2006</b>	1.36 *** [0.19]	1.55 *** [0.16]	0.80 *** [0.21]	1.16 *** [0.21]	0.15 [0.17]	1.01 *** [0.17]
<b>Year 2007</b>	2.22 *** [0.19]	2.25 *** [0.16]	1.75 *** [0.25]	1.91 *** [0.23]	0.65 *** [0.22]	1.18 *** [0.23]
<b>Year 2008</b>	0.36 [0.25]	0.19 [0.27]	0.48 ** [0.22]	0.11 [0.24]	0.59 *** [0.16]	0.18 [0.24]
<b>Year 2009</b>	-0.21 [0.30]	-0.14 [0.28]	0.21 [0.24]	0.34 [0.23]	0.02 [0.39]	0.58 [0.71]
<b>One-Sided Wald Tests:</b>						
<b>Year 2008 vs. Avg. Previous 2 Years</b>	-1.43 ***	-1.71 ***	-0.80 ***	-1.43 ***	0.19	-0.92 ***
<b>Avg. 2008 /2009 vs. Avg. Previous 2 Years</b>	-1.72 ***	-1.88 ***	-0.93 ***	-1.31 ***	-0.10	-0.72 **
<b>No. of Countries</b>	39	39	23	23	37	37
<b>No. of Observations</b>	132	132	81	81	110	110
<b>R-squared</b>	0.56	0.61	0.52	0.59	0.17	0.34
<b>Panel B. Excluding the 2008 Crisis</b>						
	<b>High-Income Countries</b>		<b>Middle-Income Countries</b>		<b>Low-Income Countries</b>	
	<b>CIF</b>	<b>COD</b>	<b>CIF</b>	<b>COD</b>	<b>CIF</b>	<b>COD</b>
<b>Year t - 2</b>	0.35 *** [0.10]	-0.02 [0.14]	0.12 [0.11]	0.08 [0.09]	0.06 [0.12]	0.02 [0.11]
<b>Year t - 1</b>	0.28 ** [0.13]	-0.07 [0.11]	-0.03 [0.13]	-0.24 ** [0.10]	0.05 [0.10]	-0.07 [0.07]
<b>Crisis Year</b>	-0.01 [0.11]	-0.27 ** [0.12]	-0.45 *** [0.12]	-0.49 *** [0.12]	-0.28 *** [0.07]	-0.25 ** [0.10]
<b>Year t + 1</b>	-0.32 *** [0.11]	-0.38 ** [0.15]	-0.37 *** [0.10]	0.07 [0.10]	-0.30 *** [0.10]	0.12 [0.09]
<b>Year t + 2</b>	-0.19 [0.14]	-0.18 [0.11]	-0.35 *** [0.10]	-0.08 [0.09]	-0.24 ** [0.10]	-0.08 [0.09]
<b>One-Sided Wald Tests:</b>						
<b>Crisis Year vs. Avg. Pre-Crisis</b>	-0.33 ***	-0.23 ***	-0.50 ***	-0.41 ***	-0.34 ***	-0.23 *
<b>Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis</b>	-0.49 ***	-0.23 ***	-0.44 ***	-0.09	-0.33 ***	-0.05
<b>Country-Trend Dummies</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>No. of Crises</b>	66	66	127	127	154	154
<b>No. of Countries</b>	39	39	26	26	38	38
<b>No. of Observations</b>	1,168	1,168	621	621	940	940
<b>R-squared</b>	0.30	0.33	0.21	0.18	0.21	0.11

The table reports two sets of regressions of capital inflows by foreign agents (CIF) and capital outflows by domestic agents (COD) on different explanatory variables. Panel A reports pooled OLS regressions on four year dummies for the 2006-2009 period. Panel B reports fixed-effects panel regressions on a five-year window around crisis events for the 1970-2005 period, controlling for country-trend effects. Capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by the standard deviation at the country level. One-sided Wald tests comparing pre- and post-crisis periods are also reported in both Panels. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1% respectively.

**Table 7**  
**Capital Flows around Crises of Different Intensities**

	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	CIF	COD	CIF	COD	CIF	COD
<b>One Crisis Episodes</b>						
Year t - 2	0.45 ***	0.14	0.21 *	0.26 ***	-0.07	-0.01
Year t - 1	0.67 ***	0.34 **	-0.01	-0.14	-0.03	-0.07
Crisis Year	-0.12	-0.45 ***	-0.33 **	-0.37 ***	-0.21 **	-0.19 **
Year t + 1	-0.56 ***	-0.71 ***	-0.35 ***	-0.03	-0.26 **	0.06
Year t + 2	-0.29 **	-0.31 **	-0.41 ***	-0.24 ***	-0.26 **	-0.15
<b>One-Sided Wald Tests:</b>						
Crisis Year vs. Avg. Pre-Crisis	-0.68 ***	-0.69 ***	-0.43 ***	-0.43 ***	-0.16 **	-0.15
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	-0.88 ***	-0.73 ***	-0.46 ***	-0.27 ***	-0.19 **	-0.05
<b>More than One Crisis Episodes</b>						
Year t - 2	1.72 ***	1.03 **	0.24	-0.10	0.43 *	0.15
Year t - 1	1.62 ***	1.84 **	0.34	-0.28	0.27	-0.06
Crisis Year	-0.35	-0.04	-0.92 ***	-1.06 ***	-0.63 **	-0.50 **
Year t + 1	-0.46	0.49	-0.51 ***	0.28	-0.55 **	0.25
Year t + 2	0.43	0.71 **	-0.43 **	0.22	-0.47 **	-0.12
<b>One-Sided Wald Tests:</b>						
Crisis Year vs. Avg. Pre-Crisis	-2.02 ***	-1.48 *	-1.21 ***	-0.87 ***	-0.98 ***	-0.55 **
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	-1.80 ***	-1.05	-0.91 ***	0.00	-0.90 ***	-0.17
<b>One-Sided Wald Tests: One Crisis vs. More than Once Crisis</b>						
Crisis Year	-0.23	0.41	-0.59 ***	-0.69 ***	-0.42 *	-0.31
Avg. Post-Crisis (incl. Crisis Year)	0.20	0.88	-0.26 **	0.03	-0.31 **	-0.03
<b>Country-Trend Dummies</b>						
Country-Trend Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Only One Crisis Episodes	80	80	107	107	126	126
No. of More than One Crisis Episodes	5	5	27	27	32	32
No. of Countries	39	39	26	26	38	38
No. of Observations	1,300	1,300	702	702	1,050	1,050
R-squared	0.36	0.37	0.29	0.27	0.22	0.18

The table reports fixed-effects panel regressions of capital inflows by foreign agents (CIF) and capital outflows by domestic agents (COD) on a five-year window around crisis events, controlling for country-trend effects. Crisis events are split into One Crisis episodes and More than One Crisis episodes. See Section 2 of the main text for details on how these indicators are constructed. Capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by the standard deviation at the country level. One-sided Wald tests comparing pre- and post-crisis periods are also reported. The sample period is from 1970 to 2009. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1% respectively.

**Table 8**  
**Components of Capital Flows: Summary Statistics**

	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	Median Average	Median Std. Dev.	Median Average	Median Std. Dev.	Median Average	Median Std. Dev.
<b>Capital Inflows by Foreign Agents</b>						
<b>Portfolio Investments</b>	2.13	2.84	0.58	1.34	0.06	0.62
1980s	0.60	0.73	0.00	0.12	0.00	0.00
1990s	2.25	1.79	0.48	1.02	0.02	0.15
2000s	3.35	3.20	0.48	1.46	0.08	0.51
<b>Other Investments</b>	3.86	5.09	1.61	4.87	1.86	4.06
1980s	2.94	3.01	0.25	3.36	3.19	3.19
1990s	2.69	3.48	1.77	2.52	1.59	2.74
2000s	5.98	7.27	1.98	3.36	0.90	2.22
<b>Direct Investments</b>	2.03	2.33	2.23	2.09	2.45	2.22
1980s	0.64	0.56	0.42	0.38	0.67	0.38
1990s	1.91	1.25	2.04	1.84	2.25	1.44
2000s	3.65	2.79	3.12	2.01	3.81	1.98
<b>Capital Outflows by Domestic Agents</b>						
<b>Portfolio Investments</b>	2.26	3.22	0.25	0.79	0.05	0.22
1980s	0.30	0.35	0.00	0.00	0.00	0.00
1990s	1.77	2.25	0.08	0.29	0.00	0.02
2000s	4.15	3.47	0.52	0.84	0.09	0.30
<b>Other Investments</b>	2.62	3.56	1.07	2.74	0.87	1.73
1980s	1.58	1.95	0.95	1.53	0.35	0.53
1990s	1.76	2.68	0.78	1.98	0.68	1.47
2000s	4.53	4.71	2.25	2.96	1.01	2.17
<b>Direct Investments</b>	1.48	1.93	0.25	0.43	0.04	0.15
1980s	0.40	0.24	0.01	0.02	0.00	0.00
1990s	0.82	0.83	0.07	0.12	0.01	0.03
2000s	3.07	2.72	0.45	0.58	0.09	0.15
<b>International Reserves</b>	0.77	2.26	1.33	2.78	1.31	2.97
1980s	0.40	1.46	0.30	2.42	0.01	1.85
1990s	0.57	2.42	1.32	2.36	1.43	2.31
2000s	0.94	1.72	1.54	2.53	2.23	2.89
<b>No. of Countries</b>	39		26		38	

The table shows summary statistics of the components of capital flows by both foreign and domestic agents. The median values of country averages and standard deviations of capital flows over trend GDP are reported. The sample period is from 1970 to 2009.

Table 9.A  
Components of Capital Flows around Crises of Different Intensities

	High-Income Countries								
	CIF				COD				
	Portfolio Equity Flows	Portfolio Debt Flows	Bank Flows	Direct Investments	Reserves	Portfolio Equity Flows	Portfolio Debt Flows	Bank Flows	Direct Investments
<b>One Crisis Episodes</b>									
Year t - 2	-0.09	0.21 **	0.54 ***	-0.05	-0.32 **	0.21 **	0.08	0.43 ***	0.09
Year t - 1	-0.16	0.33 **	0.71 ***	0.06	-0.09	-0.06	0.05	0.53 ***	0.27 **
Crisis Year	-0.40 ***	-0.05	0.07	-0.13	-0.17	-0.59 ***	-0.33 ***	-0.22	0.03
Year t + 1	0.02	-0.28 **	-0.61 ***	-0.30 ***	0.12	-0.38 ***	-0.41 ***	-0.61 ***	-0.39 ***
Year t + 2	0.14	-0.22 *	-0.28 *	-0.14	0.08	-0.11	-0.09	-0.38 ***	-0.12
<b>One-Sided Wald Tests:</b>									
Crisis Year vs. Avg. Pre-Crisis	-0.28 *	-0.32 **	-0.56 ***	-0.14 *	0.04	-0.67 ***	-0.40 ***	-0.70 ***	-0.15 **
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	0.05	-0.45 ***	-0.90 ***	-0.20 **	0.22	-0.44 ***	-0.34 ***	-0.88 ***	-0.34 ***
<b>More than One Crisis Episodes</b>									
Year t - 2	1.40 *	1.01 *	1.01 ***	1.24	1.13	0.10	0.92 **	1.67 **	0.81 *
Year t - 1	0.49 *	0.25	2.00	-0.56	-0.12	0.54	2.25 **	2.37 ***	1.59 *
Crisis Year	-1.05	-0.52	-0.15	0.31 **	0.39	-0.45	-0.62	0.74 **	-0.12
Year t + 1	0.02	-1.31 **	0.05	0.22	1.03 *	-0.26	-0.04	-0.26	0.13
Year t + 2	0.28	-0.98 ***	0.54 *	0.92	0.16	0.22	-0.05	0.73 *	0.16
<b>One-Sided Wald Tests:</b>									
Crisis Year vs. Avg. Pre-Crisis	-2.00 *	-1.15 ***	-1.66 ***	-0.03	-0.12	-0.77	-2.21 **	-1.28 *	-1.32
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	-1.20 *	-1.57 ***	-1.36 ***	0.14	0.02	-0.48	-1.82 **	-1.62 **	-1.14 **
<b>Country-Trend Dummies</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>No. of Only One Crisis Episodes</b>	77	80	80	80	80	80	80	80	80
<b>No. of More than One Crisis Episodes</b>	5	5	5	5	5	5	5	5	5
<b>No. of Countries</b>	36	38	39	39	39	38	38	39	39
<b>No. of Observations</b>	1,184	1,251	1,300	1,300	1,300	1,250	1,249	1,300	1,300
<b>R-squared</b>	0.16	0.29	0.22	0.29	0.06	0.30	0.34	0.21	0.37

The table reports fixed-effects panel regressions of the components of capital inflows by foreign agents (CIF) and of capital outflows by domestic agents (COD) for high-income countries on a five-year window around crisis events, controlling for country-trend effects. Portfolio Equity Flows and Portfolio Debt Flows are subcomponents of "Portfolio Investments", Bank Flows is equivalent to "Other Investments", and "Reserves" is equivalent to "International Reserve Assets." Crisis events are split into One Crisis episodes and More than One Crisis episodes. See Section 2 of the main text for details on how these indicators are constructed. The components of capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by their standard deviation at the country level. One-sided Wald tests comparing pre- and post-crisis periods are also reported. The sample period is from 1970 to 2009. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1% respectively.

**Table 9.B**  
**Components of Capital Flows around Crises of Different Intensities**

	Middle-Income Countries								
	CIF				COD				
	Portfolio Equity Flows	Portfolio Debt Flows	Bank Flows	Direct Investments	Reserves	Portfolio Equity Flows	Portfolio Debt Flows	Bank Flows	Direct Investments
<b>One Crisis Episodes</b>									
Year t - 2	0.08	0.14	0.19	-0.02	0.22 *	0.06	-0.07	0.20 **	0.04
Year t - 1	-0.12	-0.03	0.12	-0.07	-0.22 **	0.25 **	-0.13	0.02	-0.04
Crisis Year	-0.41 ***	-0.05	-0.22	-0.20 **	-0.46 ***	-0.08	0.00	-0.08	0.06
Year t + 1	-0.02	0.08	-0.35 ***	-0.33 ***	-0.01	-0.01	0.05	-0.00	-0.13
Year t + 2	-0.20 *	-0.13	-0.35 **	-0.19 **	-0.24 **	-0.13	0.14	-0.09	-0.20 **
<b>One-Sided Wald Tests:</b>									
Crisis Year vs. Avg. Pre-Crisis	-0.39 ***	-0.11	-0.38 ***	-0.16 *	-0.46 ***	-0.24 **	0.10	-0.19 *	0.06
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	-0.19 **	-0.09	-0.46 ***	-0.20 ***	-0.24 **	-0.23 ***	0.16	-0.17 **	-0.09
<b>More than One Crisis Episodes</b>									
Year t - 2	0.03	0.15	0.20	0.02	-0.07	0.00	0.26	0.08	0.09
Year t - 1	0.36	0.30	0.31	-0.07	-0.41 **	0.09	-0.23 ***	0.04	0.09
Crisis Year	0.06	-0.44 ***	-0.84 ***	-0.30	-1.00 ***	-0.32 ***	-0.33	-0.30	-0.23
Year t + 1	0.12	-0.24 **	-0.42 **	-0.30 **	0.32	-0.00	-0.09	0.21	-0.27 **
Year t + 2	0.28	-0.22	-0.42 ***	-0.19	0.38 **	-0.29 ***	0.54 ***	-0.17	-0.20
<b>One-Sided Wald Tests:</b>									
Crisis Year vs. Avg. Pre-Crisis	-0.14	-0.67 ***	-1.10 ***	-0.28 *	-0.76 ***	-0.37 **	-0.35 *	-0.36	-0.32 **
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	-0.04	-0.53 ***	-0.82 ***	-0.24	0.14	-0.25	0.03	-0.15	-0.32 ***
<b>Country-Trend Dummies</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Only One Crisis Episodes	94	98	107	107	109	98	100	107	98
No. of More than One Crisis Episodes	26	27	27	27	27	24	27	27	26
No. of Countries	22	23	26	26	26	23	24	26	23
No. of Observations	604	632	702	702	717	634	664	702	634
R-squared	0.11	0.09	0.24	0.39	0.19	0.17	0.15	0.16	0.31

The table reports fixed-effects panel regressions of the components of capital inflows by foreign agents (CIF) and of capital outflows by domestic agents (COD) for middle-income countries on a five-year window around crisis events, controlling for country-trend effects. Portfolio Equity Flows and Portfolio Debt Flows are subcomponents of "Portfolio Investments", Bank Flows is equivalent to "Other Investments", and "Reserves" is equivalent to "International Reserve Assets." Crisis events are split into One Crisis episodes and More than One Crisis episodes. See Section 2 of the main text for details on how these indicators are constructed. The components of capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by their standard deviation at the country level. One-sided Wald tests comparing pre- and post-crisis periods are also reported. The sample period is from 1970 to 2009. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1% respectively.

**Table 9.C**  
**Components of Capital Flows around Crises of Different Intensities**

	Low-Income Countries								
	CIF				COD				
	Portfolio Equity Flows	Portfolio Debt Flows	Bank Flows	Direct Investments	Reserves	Portfolio Equity Flows	Portfolio Debt Flows	Bank Flows	Direct Investments
<b>One Crisis Episodes</b>									
Year t - 2	-0.21 *	0.05	0.01	-0.15 **	0.02	-0.10	0.05	0.04	-0.02
Year t - 1	0.08	-0.14 *	0.05	-0.09	-0.08	-0.07	-0.09	0.05	0.01
Crisis Year	-0.14 *	-0.20	-0.21 **	-0.09	-0.14	-0.03	-0.00	-0.04	0.02
Year t + 1	0.06	-0.22 **	-0.20 **	-0.12	-0.07	-0.14 ***	-0.12	0.31 ***	-0.10
Year t + 2	-0.05	-0.14	-0.21 **	-0.20 **	-0.10	-0.11 **	-0.07	-0.05	-0.16 **
<b>One-Sided Wald Tests:</b>									
Crisis Year vs. Avg. Pre-Crisis	-0.08	-0.16	-0.24 **	0.03	-0.11	0.06	0.02	-0.09	0.03
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	0.02	-0.14 *	-0.24 **	-0.02	-0.07	-0.01	-0.04	0.03	-0.08
<b>More than One Crisis Episodes</b>									
Year t - 2	0.41 *	0.59 *	0.33 *	0.23	0.08	-0.01	0.04	0.16	0.00
Year t - 1	0.22	0.51 **	0.26	0.12	-0.42 **	-0.02	-0.23 **	0.31	0.08
Crisis Year	-0.18	-0.08	-0.65 **	-0.04	-0.56 **	-0.01	-0.13 *	-0.07	-0.03
Year t + 1	-0.07	-0.25	-0.41 **	-0.24	0.16	0.15	-0.15	0.20	-0.08
Year t + 2	0.05	-0.18	-0.35 **	-0.24	0.26	-0.08	-0.10	-0.57 ***	-0.16
<b>One-Sided Wald Tests:</b>									
Crisis Year vs. Avg. Pre-Crisis	-0.50 *	-0.63 **	-0.95 ***	-0.22 *	-0.39 *	0.01	-0.04	-0.31 *	-0.07
Avg. Post-Crisis (incl. Crisis Year) vs. Avg. Pre-Crisis	-0.38 **	-0.72 ***	-0.77 ***	-0.35 **	0.12	0.04	-0.03	-0.38 ***	-0.13
<b>Country-Trend Dummies</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>No. of Only One Crisis Episodes</b>	92	108	126	126	126	109	111	126	107
<b>No. of More than One Crisis Episodes</b>	24	29	32	32	32	29	27	32	26
<b>No. of Countries</b>	30	30	38	38	38	32	31	38	33
<b>No. of Observations</b>	821	853	1,050	1,050	1,050	890	853	1,050	889
<b>R-squared</b>	0.12	0.12	0.26	0.38	0.12	0.13	0.12	0.15	0.25

The table reports fixed-effects panel regressions of the components of capital inflows by foreign agents (CIF) and of capital outflows by domestic agents (COD) for low-income countries on a five-year window around crisis events, controlling for country-trend effects. Portfolio Equity Flows and Portfolio Debt Flows are subcomponents of "Portfolio Investments", Bank Flows is equivalent to "Other Investments", and "Reserves" is equivalent to "International Reserve Assets." Crisis events are split into One Crisis episodes and More than One Crisis episodes. See Section 2 of the main text for details on how these indicators are constructed. The components of capital flows are first normalized by trend GDP and then standardized by de-meaning and dividing by their standard deviation at the country level. One-sided Wald tests comparing pre- and post-crisis periods are also reported. The sample period is from 1970 to 2009. Standard errors, clustered at the country-level, are reported in brackets. \*, \*\*, and \*\*\* mean significant at 10%, 5%, and 1% respectively.



**Appendix Table 1**  
**Sample Coverage**

<u>High-Income Countries</u>	<u>Coverage</u>	<u>Middle-Income Countries (cont.)</u>	<u>Coverage</u>
Australia	1970 - 2008	Libya	1977 - 2008
Austria	1970 - 2009	Lithuania	1993 - 2008
Bahamas, The	1976 - 2008	Malaysia	1974 - 2008
Barbados	1970 - 2007	Mauritius	1976 - 2008
Belgium-Luxembourg	1975 - 2008	Mexico	1979 - 2008
Canada	1970 - 2009	Panama	1977 - 2009
Cyprus	1976 - 2009	Poland	1985 - 2009
Czech Republic	1993 - 2008	Romania	1987 - 2009
Denmark	1975 - 2009	Russian Federation	1994 - 2009
Estonia	1992 - 2009	South Africa	1985 - 2009
Finland	1975 - 2009	Turkey	1974 - 2008
France	1975 - 2008	Uruguay	1978 - 2008
Germany	1971 - 2008	Venezuela, R.B.	1970 - 2009
Greece	1976 - 2008		
Hong Kong	1998 - 2008		
Hungary	1982 - 2008		
Iceland	1976 - 2009		
Ireland	1974 - 2009		
Israel	1970 - 2009		
Italy	1970 - 2009		
Japan	1977 - 2008		
Korea, Rep.	1976 - 2009		
Kuwait	1975 - 2008		
Malta	1971 - 2008		
Netherlands	1970 - 2009		
New Zealand	1972 - 2008		
Norway	1975 - 2008		
Oman	1974 - 2008		
Portugal	1975 - 2009		
Saudi Arabia	1971 - 2008		
Singapore	1972 - 2008		
Slovak Republic	1993 - 2008		
Slovenia	1992 - 2008		
Spain	1975 - 2009		
Sweden	1970 - 2008		
Switzerland	1977 - 2009		
Trinidad and Tobago	1975 - 2007		
United Kingdom	1970 - 2009		
United States	1970 - 2009		
<u>Middle-Income Countries</u>	<u>Coverage</u>	<u>Low-Income Countries</u>	<u>Coverage</u>
Argentina	1976 - 2009	Albania	1984 - 2008
Belarus	1993 - 2009	Algeria	1977 - 1991
Botswana	1975 - 2008	Angola	1985 - 2008
Brazil	1975 - 2009	Armenia	1993 - 2008
Bulgaria	1980 - 2009	Azerbaijan, Rep. of	1995 - 2008
Chile	1975 - 2009	Bolivia	1976 - 2008
Costa Rica	1977 - 2008	Bosnia and Herzegovina	1998 - 2008
Croatia	1993 - 2008	China, P.R.: Mainland	1982 - 2008
Equatorial Guinea	1987 - 1996	Colombia	1970 - 2008
Gabon	1978 - 2005	Congo, Republic of	1978 - 2007
Iran, I.R. of	1976 - 2000	Dominican Republic	1970 - 2008
Kazakhstan	1995 - 2008	Ecuador	1976 - 2008
Latvia	1992 - 2009	Egypt	1977 - 2008
		El Salvador	1976 - 2008
		Georgia	1997 - 2008
		Guatemala	1977 - 2008
		Honduras	1974 - 2008
		India	1975 - 2008
		Indonesia	1981 - 2009
		Jamaica	1976 - 2008
		Jordan	1972 - 2008
		Macedonia	1996 - 2008
		Moldova	1994 - 2009
		Mongolia	1981 - 2006
		Morocco	1975 - 2008
		Namibia	1990 - 2008
		Nicaragua	1977 - 2008
		Pakistan	1976 - 2008
		Paraguay	1975 - 2009
		Peru	1977 - 2008
		Philippines	1977 - 2008
		Sri Lanka	1975 - 2008
		Swaziland	1974 - 2007
		Syrian Arab Republic	1977 - 2007
		Thailand	1975 - 2008
		Tunisia	1976 - 2008
		Ukraine	1994 - 2009
		Vietnam	1996 - 2008



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