Capital Flow Waves:
Surges, Stops, Flight and Retrenchment

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Abstract: This paper analyzes the drivers of international waves in capital flows. We build on the literature on "sudden stops" and "bonanzas" to develop a new methodology for identifying episodes of extreme capital flow movements using quarterly data on gross inflows and gross outflows, differentiating activity by foreigners and domestics. We identify episodes of "surge", "stop", "flight" and "retrenchment" and show how our approach yields fundamentally different results than the previous literature that used measures of net flows. Global factors, especially global risk, are important determinants of these episodes. Contagion, especially through the bilateral exposure of banking systems, is important in determining stop and retrenchment episodes. Domestic macroeconomic characteristics are generally less important, although changes in domestic economic growth influence episodes caused by foreigners. We find little role for global interest rates and global liquidity in explaining surges in foreign capital flows (independent of global risk and global growth). We also find little role for capital controls in reducing capital flow waves. The results help discern between different theoretical approaches explaining crises and capital flow volatility.

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1. Introduction

International capital flows have undergone a series of cycles or "waves" over the past decade. Capital flows dried up in late 2001, surged throughout the mid-2000s, contracted sharply during the Global Financial Crisis (GFC) of 2008-2009, and then rebounded quickly in 2010. Although many countries also experienced waves of capital flows in the 1980s and 1990s, capital flow volatility has increased in the past decade.[1] This volatility can have widespread economic consequences. Large increases and decreases in capital flows can amplify economic cycles, increase financial system vulnerabilities, and aggravate overall macroeconomic instability. Some countries, however, have experienced less volatility in international capital flows and even benefited from sudden capital inflows during crises. For example, even as global liquidity contracted during the GFC, several countries received net capital inflows driven by a "retrenchment" of domestic investors as they liquidated foreign investments.

These waves in capital flows have generated an extensive academic literature. Several papers have examined "sudden stops" (when foreign capital inflows suddenly reverse), "surges" or "bonanzas" (when foreign capital inflows increase rapidly) or capital "flight" (when domestic investors send large amounts of capital abroad).[2] Other papers have focused on explaining capital flows more broadly, on contagion in capital flows, on current account reversals and crises, or more narrowly on capital flows during the recent GFC.[3] This paper synthesizes these studies in an effort to better understand what causes these waves of capital flows, i.e., what causes the major ebbs and flows of capital globally and to and from individual countries. Instead of focusing on a single type of capital flow episode in isolation (such as a stop, surge, or flight), this paper is the first effort to consider those three types of episodes plus periods of "retrenchment" by viewing them as global cycles in capital flows. This paper does not attempt to explain small fluctuations in capital flows, but instead focuses only on extreme movements or "waves".

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[1] For evidence, see Broner, Didier, Erce and Schmukler (2010).

[2] For examples of the literature on sudden stops, see Calvo (1998) and Calvo, Izquierdo and Meijía (2004, 2008). For examples of the literature on bonanzas/surges, see Reinhart and Reinhart (2009), Caballero (2010) and Cardarelli, Elekdag, and Kose (2009). This literature is also related to the series of papers on credit booms, such as Gourinchas, Valdés, and Landerretche (2001) and Mendoza and Torrones (2008). On capital flight, see Dooley (1988), Khan and UlHaque (1985), Lessard and Williamson (1987), Faucette, Rothenberg, and Warnock (2005), Cowan and De Gregorio (2007), Cowan et al. (2008), and Rothenberg and Warnock (2010).

[3] For discussion of a series of papers on contagion, see Claessens and Forbes (2001). Examples of the literature on current account reversals include Adalet and Eichengreen (2007), Edwards (2005), and Freund and Warnock (2007). Milesi-Ferretti and Tille (2010) focus on capital flows during the recent crisis, while Broner et al. (2010) analyze how capital flows relate to business cycles and crises.

Almost all previous work on capital flow episodes relied on proxies for *net* capital flows that cannot differentiate between changes in foreign and domestic behavior. The increase in the size and volatility of gross flows, however, has fundamentally altered earlier interpretations of net flows. For example, Figure 1 shows net capital flows into Chile, foreign inflows into Chilean assets (gross inflows) and Chilean flows into non-Chilean assets (gross outflows).[4] In the early and mid-1990's net capital inflows roughly mirrored gross inflows, so the capital outflows of domestic investors could largely be ignored and changes in net inflows were interpreted as being driven by changes in foreign flows. Over the past five years, however, both gross inflows and gross outflows have increased dramatically while net capital flows have been more stable. An analysis focusing on net capital flows would miss these dramatic changes in gross flows. Moreover, changes in net flows can no longer be interpreted as being driven solely by foreigners, as domestic investors' international investment has become increasingly important. Similar trends occur in many countries around the world.

This paper follows an approach that is fundamentally different from the existing literature. Our analysis focuses on *gross* capital flows, differentiating between capital movements viewed as being initiated by foreigners and those viewed as being initiated by domestic investors.[5] This differentiation is important because foreign and domestic investors can be motivated by different factors, focus on different types of capital flows, and respond differently to various policies and shocks. Policymakers might also react differently based on whether episodes are seen to be instigated by domestic or foreign sources.

To identify extreme capital flow episodes we utilize quarterly data on gross inflows and gross outflows for a broad sample of emerging and developed economies. We identify prolonged episodes of extreme gross capital flows, when domestic or foreign investors substantially increase or decrease capital flows into or out of a country relative to their historic levels. We call these "surge", "stop", "flight" and "retrenchment" episodes (all defined in more detail below). We document the incidence of each type of episode over time, as well as the incidence by income level and region. We also show how

[4] Following standard balance-of-payments accounting, an outflow is expressed as a negative value. The terminology can be confusing. "Gross inflows" and "gross outflows" are actually "net" items; gross inflows is the net of foreign purchases of domestic securities and foreign sales of domestic securities, while gross outflows is the net of domestic residents' purchases of foreign securities and domestic residents' sales of foreign securities. We follow the literature and use the standard terminology of gross inflows, gross outflows, and the net of the two (net inflows).

[5] The importance of studying gross flows, instead of just net flows, is also emphasized in Broner, Didier, Erce and Schmukler (2010) and in Milesi-Ferretti and Tille (2010).

our approach, compared to the previous literature that used proxies for net flows, yields fundamentally different results on the incidence and drivers of sudden stops and surges.

After identifying episodes of extreme capital movements, the paper shifts to its main goal: understanding what causes the episodes. We briefly review the theoretical literature, which describes capital flow episodes as being driven by global factors, contagion, and/or domestic factors. This literature review yields strong testable predictions; different classes of models predict different patterns of domestic and foreign capital flows during periods of booms and crises. We then evaluate which theories appear most relevant in explaining the patterns of capital flows since 1986, beginning with a descriptive analysis and then moving to more formal regressions.

The descriptive analysis of the role of global, contagion, and domestic factors shows clear global effects driving capital flow waves. The recent crisis saw an unprecedented incidence of sudden stops and retrenchment, as investors around the world liquidated foreign investment positions and brought money home. In more formal empirical tests for the role of global, contagion, and domestic factors, we use a complementary logarithmic regression framework that incorporates the fact that the incidence of episodes is skewed. These results indicate that all types of episodes have some global, contagion, and domestic components. Surges and flight occur when global conditions are calm, while stops and retrenchment occur during periods of elevated volatility. Middle and low income countries are generally affected by changes in the global environment to the same degree as high income countries, except lower income countries are less likely to have domestic investors return money home (retrenchment) during periods of high global volatility.

For the main analysis, we break down the global, contagion and domestic factors into specific components to better understand how each factor affects the probability of surges, stops, flight and retrenchment. Global factors appear to be the most important determinants of capital flow waves, with an important role for contagion in certain types of episodes and less evidence supporting domestic factors. More specifically, global risk (driven largely by changes in economic uncertainty) appears to be the most consistent factor explaining different types of episodes. Global growth is also important in predicting extreme capital flow movements driven by foreigners (surges and stops). Contagion through financial linkages (and sometimes through trade or geography) is highly significant in predicting the probability of stops and retrenchment. Global liquidity and global interest rates, as well as a country's capital controls, financial system development, and debt levels are usually insignificant in predicting the probability of capital flow episodes. The domestic factor which is most consistently significant is

domestic growth shocks, which influences surges and stops. While a number of factors are significant in predicting the probability of surges, stops, and retrenchment episodes, the variables we analyze are usually insignificant in differentiating the fourth type of episode—flight—from periods of "normal" capital flows.

The analysis in this paper provides insights for theory, empirical research, and policy. A more complete understanding of what causes waves of global capital flows is necessary to assess the relevance of different theoretical approaches in explaining stops, capital flow volatility, and crises more generally. Much of this theoretical literature has emphasized the role of domestic vulnerabilities, such as unsustainable current account deficits or financial system vulnerabilities. Other papers have emphasized the role of contagion (through channels such as trade or finance) or of global factors (such as global interest rates, demand, risk aversion, or private information).[6] A more recent series of theoretical models has attempted to explain the GFC by focusing on global shocks—whether changes in risk (Bacchetta and van Wincoop, 2010 and Gourio, Siemer, and Verdelhan, 2010), wealth (Dedola and Lombardo, 2010 and Devereux and Yetman, 2010) or liquidity/credit (Calvo, 2009, Giannetti, 2007, Kalemli-Ozcan, Papaioannou, and Perri, 2010)—with little or no role for domestic factors.

Our analysis helps ascertain the relative importance of these different theoretical models in explaining the waves in capital flows experienced around the world from 1986 through 2009. For example, our finding that the primary factor driving capital flow episodes is changes in global risk supports the focus on risk in much of the recent theoretical literature. The results do not support, however, the widespread presumption that changes in interest rates or liquidity in a major economy, such as the United States, is the most important factor driving surges in capital flows (independent of any effect on global risk and growth). The results find a role for a country's economic growth in determining foreigners' surges and stops, but not in determining episodes driven by domestic investors. This suggests that the emphasis of many theoretical models on productivity shocks as key determinants of capital flows (such as the real business cycle literature) might be more relevant in explaining gross capital inflows, but less applicable in explaining increases and volatility in domestic residents' international investment.

The analysis in this paper also informs empirical research as our more disaggregated focus on gross flows by type of investor allows a finer delineation of different types of episodes. This delineation

[6] For summaries of the extensive literature on contagion, see Claessens, Dornbusch and Park (2001) and Claessens and Forbes (2001). See Calvo, Leiderman and Reinhart (1996) and Chuhan, Claessens and Mamingi (1998) for summaries of the discussion on the role of global factors versus domestic factors in driving capital flows to emerging markets.

is necessary to understand the underlying causes of capital flow waves. By differentiating gross inflows from gross outflows, our analysis shows that many episodes previously identified as "surges" of foreign investment are actually driven by the retrenchment of domestic residents. Similarly, the earlier methodology missed periods of sudden stops in foreign capital inflows when these stops occurred simultaneously with an increase in global risk and retrenchment by domestic investors. More generally, previous empirical research on international capital flows that focused on more aggregate data was unable to capture the complete dynamics and causes of capital flow cycles.

Finally, our results on the relative importance of global, contagion, and domestic effects in causing extreme movements in capital flows has important implications for economic policy. Capital flow volatility can have substantial economic costs, especially in emerging economies with less developed financial systems. For example, surges are correlated with real estate booms, banking crises, debt defaults, inflation and currency crises (Aizenman and Jinjarak, 2009, Caballero, 2010, and Reinhart and Reinhart, 2009) and sudden stops are correlated with currency depreciations, slower growth, and higher interest rates (see Edwards, 2005, and Freund and Warnock, 2007). For policymakers hoping to reduce these vulnerabilities and mitigate negative outcomes, a clear identification of episodes and an understanding of their causes are vital. Our results suggest that many domestic factors only have a limited effect on capital flow volatility. For example, we find little evidence that capital controls can significantly insulate an economy against capital flow waves. As a result, governments concerned about capital flow volatility should consider prioritizing how to strengthen their country's ability to withstand this volatility rather than trying to reduce it. Finally, the results indicate a significant role for global and contagion factors in driving episodes, suggesting an important role for global institutions and cross-country cooperation to reduce the volatility of global capital flows.

The remainder of the paper is as follows. Section 2 discusses how previous work defined episodes of extreme capital flow movements and then develops our new methodology based on gross capital flows. Section 3 summarizes the theoretical literature attempting to explain different types of episodes, and then analyzes patterns in the data and performs a preliminary set of empirical tests on the importance of global, contagion, and domestic factors in explaining the episodes. Section 4 disaggregates these factors into specific components to test for the role of individual variables in causing the waves in capital flows and uses the results to differentiate between theoretical models. Section 5 concludes.

2. Measuring Abnormal Capital Flow Episodes

There are several methodologies that can be used to identify capital flow episodes; each has its advantages and disadvantages. Our methodology has its origin in the traditional measures of sudden stops and capital flow bonanzas, with the primary difference being that we use gross flow data rather than net inflow proxies. By sticking closely to the previous literature's methodology, we can better highlight the difference made by focusing on gross instead of net flows.[7]

This section first summarizes measures of extreme capital flow episodes traditionally used in the literature. It then describes our new measures before presenting several examples of additional insights that can be gained using data on gross instead of net flows.

2.1 Earlier Measures Using Proxies for Net Inflows: Sudden Stops and Capital Flow Bonanzas

The most well-known measure of abnormal capital flows is of "sudden stops" as initially developed in Calvo (1998) and then further developed by Calvo and various coauthors. Calvo et al. (2004) calculate this measure using the following approach. First, construct a proxy for monthly net private capital inflows, P_t, by subtracting monthly changes in international reserves from the quarterly current account balance. Then define C_t to be a 12-month moving sum of lagged values and compute annual year-over-year changes in C_t:

$$C_t = \sum_{i=0}^{11} P_{t-i} \qquad t = 1, 2, \ldots, N \ . \tag{1}$$

$$\Delta C_t = C_t - C_{t-12} \qquad t = 13, 14, \ldots, N \ . \tag{2}$$

In the sudden stops literature, episodes are generally defined as periods when there are marked slowdowns in net capital inflows.[8] Anyone working in this literature must make several ad hoc decisions to operationalize "marked slowdown". For example, a slowdown relative to what? And how sharp must the slowdown be? For "relative to what", Calvo et al. (2004) compare the current ΔC_t (the amount of net private inflows in the last 12 months compared to the amount in the preceding 12 months) to its

[7] In sensitivity tests, we show that our main results are robust to alternative episode definitions.

[8] Recent papers have built on this definition of sudden stops. For example, Calvo, Izquierdo and Meijía (2004) also require that the stop occurs at the same time as a contraction in output in order to avoid classifying a positive terms of trade shock as a stop. Calvo, Izquierdo and Mejía (2008) define "systemic sudden stops" as sudden stops that occur in conjunction with a sharp rise in aggregate interest rate spreads to capture a global component of the shock.

historical mean, with the mean computed using all available historical data up to month *t* (and requiring at least 24 months of ΔC_t). For "marked slowdown", Calvo et al. (2004) mark the beginning of an episode at the month *t* when ΔC_t falls one standard deviation below its rolling historical mean, providing that at some point within the episode ΔC_t falls at least two standard deviations below its mean. The episode ends once ΔC_t again exceeds one standard deviation below its mean. A stop therefore occurs when net inflows slow; it is not necessary for net inflows to fall to zero or reverse.

Rothenberg and Warnock (2010) builds on the stops literature by pointing out that measures constructed from proxies for net inflows are not able to differentiate between stops that are due to the actions of foreigners and those due to locals fleeing the domestic market. Rothenberg and Warnock (2010) use the standard approach to define sudden stops, and then break these down into "true sudden stops" (when gross capital inflows decrease more than gross capital outflows increase) and "sudden flight" (when gross capital outflows increase more than gross capital inflows decrease).

In addition to the papers analyzing when net capital inflows suddenly slow, another series of papers examine episodes of "surges" in net capital inflows. Reinhart and Reinhart (2009) call these periods "bonanzas" and, using a proxy for net capital inflows (built from annual data), define episodes in a way similar to that used by Calvo et al (2004) to analyze sudden stops.[9]

2.2 Our Measures Using Gross Flows: Surges, Stops, Flight and Retrenchment

In this paper we build on this traditional approach to identifying episodes of extreme capital flows movements developed in Calvo (1998), Calvo et al. (2004), and discussed in the previous section, but make three fundamental changes. First, we use data on actual flows instead of current-account-based proxies for flows. Second, from the outset we use data on gross flows to identify episodes, rather than relying on proxies for net flows. [10] Finally, we analyze both large increases and large decreases of both inflows and outflows, instead of just focusing on increases or decreases. This approach, and especially

[9] Other recent papers that examine bonanzas include Aizenman and Jinjarak (2009) and Caballero (2010). Also related to this work is a series of papers that focus on domestic credit booms and credit cycles, such as Gourinchas, Valdés and Landerretche (2001) and Mendoza and Torrones (2008). These papers tend to take a different approach by defining episodes as increases in credit relative to a stochastic trend.

[10] Note that gross capital inflows are net purchases of domestic assets by foreign investors and gross outflows are net purchases of foreign assets by domestic investors. We note that the use of tax havens, or any low-tax areas, can confound residency-based capital flows data. For example, if a U.S.-based investor books a U.S. equity purchase through the Cayman Islands, this will look like a foreign inflow into U.S. equities. To our knowledge, no residency-based system can get around this issue.

our ability to capture distinctions in the behavior of domestic and foreign investors by using gross instead of net flows, will allow a more nuanced understanding of extreme capital flow episodes, as well as an improved understanding of the full cycles of capital flow waves.

More specifically, we use quarterly gross flows data in a sample of 58 countries over the period from 1980 through 2009 to identify four types of episodes:[11]

- "Surges": a sharp increase in gross capital inflows;
- "Stops": a sharp decrease in gross capital inflows;
- "Flight": a sharp increase in gross capital outflows; and
- "Retrenchment": a sharp decrease in gross capital outflows.

The first two types of episodes—surges and stops—are driven by foreigners while the last two—flight and retrenchment—are driven by domestic investors.

We calculate year-over-year changes in four-quarter gross capital inflows and outflows and define episodes using three criteria: (1) current year-over-year changes in four-quarter gross capital inflows or outflows is more than two standard deviations above or below the historic average during at least one quarter of the episode; (2) the episode is defined as lasting for all consecutive quarters for which the year-over-year change in annual gross capital flows is more than one standard deviation above or below the historical average; and (3) the length of the episode is greater than one quarter.[12]

To provide a more concrete example of our methodology, consider the calculation of surge and stop episodes. Let C_t be a 4-quarter moving sum of gross capital inflows (GINFLOW), and compute annual year-over-year changes in C_t:

$$C_t = \sum_{i=0}^{3} GINFLOW_{t-i} \ , \qquad \text{with} \quad t = 1, 2, \ldots, N \quad \text{and} \qquad (3)$$

$$\Delta C_t = C_t - C_{t-4} \ , \qquad \text{with } t = 5, 6, \ldots, N \ . \qquad (4)$$

[11] We start with as broad a sample as possible and only exclude countries that do not have detailed quarterly gross flows data.
[12] Summing capital flows over four quarters is analogous to the traditional literature's focus on one year of flows and also eliminates the impact of seasonal fluctuations. The historical average and standard deviation are calculated over the last five years (20 quarters) and we require that countries have at least 4 years worth of data to calculate a "historic" average.

Next, compute rolling means and standard deviations of ΔC_t over the last 5 years. A "surge" episode is defined as starting the first month t that ΔC_t increases more than one standard deviation above its (rolling) mean. The episode ends once ΔC_t falls below one standard deviation above its mean. In addition, in order for the entire period to qualify as a surge episode, there must be at least one quarter t when ΔC_t increases at least two standard deviations above its mean.

A stop episode, defined using a symmetric approach, is a period when gross inflows fall one standard deviation below its mean, provided it reaches two standard deviations below at some point. The episode ends when gross inflows are no longer at least one standard deviation below its mean.

Episodes of flight and retrenchment are defined similarly, but using gross private outflows rather than gross inflows, and taking into account that in BOP accounting terms outflows by domestic residents are reported with a negative value. In other words, when domestic investors acquire foreign securities, in BOP accounting terms gross outflows are negative. A sudden flight episode therefore occurs when gross outflows (in BOP accounting terms) fall one standard deviation below its mean, provided it reaches two standard deviations at some point, and end when gross outflows come back above one standard deviation below the mean. Finally, a sudden retrenchment episode occurs when gross outflows increase one standard deviation above its mean, providing it reaches two standard deviations above at some point, and end when gross outflows come back below one standard deviation above the mean.

To calculate these episodes, our primary source is data from the International Monetary Fund's International Financial Statistics (accessed through Haver Analytics in March 2011) on quarterly gross capital inflows and outflows expressed in billions of U.S. dollars. We include all countries for which quarterly data for balance of payments flows are available for at least ten years. Data end in Q42009. For missing countries and observations, we augment this data with information from the country authorities. The resulting sample consists of 58 countries listed in Appendix Table 1.[13] The table also lists the start date for which quarterly capital flow data is available for each country. All countries have data through the end of the sample, but start dates differ: 32 countries provide data in 1980, 39 countries in 1990, 53 countries in 1995 and the full sample of 58 countries by 2000. In our baseline measure, we define gross capital inflows as the sum of inflows of direct investment, portfolio inflows and other inflows; gross private capital outflows are defined analogously as the sum of direct investment outflows, portfolio

[13] China is not in our sample, as it only recently began to publish quarterly capital flow data. Singapore and Taiwan do not publish quarterly flows data in IFS, but their data is readily available from government sources. Appendix Table 1 shows that some countries have gaps in IFS capital flows data; we assume no episodes occur during a data gap.

outflows, and other outflows, with reserve accumulation omitted. We also conduct a series of sensitivity tests using alternative measures, but initially focus on these inclusive measures of gross capital outflows and gross private capital inflows.[14] In 2007, our sample includes $10.9 trillion of gross capital inflows, capturing about 97% of global capital inflows recorded by the IMF.[15]

Using these data and methodology, Figure 2 shows our identification of surges and stops for one country (Brazil) from 1990 through 2010. The solid black line is the change in annual gross capital inflows as defined in equation (4). The dashed red lines are the bands for mean capital inflows plus or minus one standard deviation, and the dotted green lines are the comparable two-standard-deviation bands. We classify an episode as a sudden stop if annual capital inflows fall below the lowest line (the two standard deviation line) for at least one quarter, with the episode starting when it initially crosses the one-standard deviation line and ending when it crosses back over the same line. Similarly, we classify an episode as a sudden surge if annual capital flows rise above the highest line (the two standard deviation line), with the episode starting when it initially crosses the one-standard deviation line and ending when it crosses back over the same line.

According to these criteria, four periods qualify as sudden stops: 1993Q1 to 1993Q3 (a period of hyperinflation in Brazil), 1995Q1 to 1995Q2 (the Mexican peso crisis), 1999Q1 to 1999Q2 (a devaluation in Brazil) and 2008Q2 to 2009Q3 (the most recent global crisis). Four other periods qualify as sudden surges: 1990Q2 to 1991Q1 (after Brazil elected a new president in its first democratic election in decades and hoped that inflation would be defeated), 1994Q1 to 1994Q3 (just before the Mexican peso crisis), 1995Q4 to 1996Q2 (a period of strong capital flows to many emerging markets before the Asian crisis), and 2006Q3 to 2007Q4 (just before the recent crisis). The episodes suggest that stops might be caused by a mix of domestic, regional, and global shocks, while surges might be driven by domestic or global factors.

2.3 The Episodes: Surges, Stops, Flight and Retrenchment

Using the quarterly gross flows data and the criteria discussed above, from 1980 through 2009 we identify 168 surge, 220 stop, 194 flight and 211 retrenchment episodes; see Appendix Table 2 for a

[14] There are a number of reasonable alternative measures of gross flows—such as excluding currency swap arrangements by the Federal Reserve Board during the recent crisis or including changes in reserves in capital outflows in order to capture total outflows rather than private outflows. The sensitivity analysis shows these alternate definitions have no significant effect on the key results, although including reserves in capital outflows can affect episode dates for some countries.
[15] Estimates based on worldwide financial account liabilities (inflows) of $11.2 trillion in 2007 as reported in IMF, BOP (CD-ROM for 01/10).

list of episodes and dates by country. Table 1 aggregates these results and reports summary statistics on the incidence of episodes for the full sample and on the average length of each episode for the full sample and by income group and region.[16] Stops are slightly more prevalent than surges, but surges last longer; for the full sample, the average length of each type of episode is roughly one year, with surges lasting the longest with an average length of 4.5 quarters and retrenchments the shortest with an average length of 3.8 quarters. The breakdown by income group indicates that lower income countries experienced shorter episodes than the high and middle income groups over the full sample period, even for episodes such as stops and flight.

On average, given how we identify episodes (specifically, by using a two standard-deviation cutoff), a country's gross flows will be in an episode about one-third of the time. As Appendix Table 2 suggests, however, there is considerable cross-country variation in the incidence of different types of episodes. For example, focusing on the gross inflows measures, Argentina has experienced much fewer surges than stops, being in a surge episode only 12 percent of the time from 1985 through 2009, but in a stop episode in 1 out of every 4 quarters. In contrast, other countries (such as Brazil) were more likely to be in a surge than a stop. It is this variation across countries that this paper seeks to explain.

2.4. A Comparison of Measures based on Gross and Net Flows

The periods of surges, stops, flight and retrenchment discussed above are defined using information on gross capital flows by domestic and foreign investors. The episodes identified using gross flows are substantially different from those in previous work (discussed in Section 2.1) that used proxies for net capital flows and did not differentiate between the behavior of domestic and foreign investors. The identification of different episodes across techniques is not surprising given that the aggregated net flows proxies comingle different types of flows.

To better understand these methodological differences, we examine episodes using the two techniques during the height of the GFC—the two quarters from 2008 Q4 to 2009 Q1. Table 2 lists the countries defined as having a surge or stop episode using net capital inflows (similar to the measure used in previous work) and gross flows (as identified in this paper). For each column we use the methodology

[16] We use income classifications in the year 2000 based on GNI per capita as reported by the World Bank, with "lower income" referring to countries classified as "Low income" and "Middle/lower income", "Middle income" referring to countries classified as "Middle/higher income". "Higher income" refers to countries classified as "High income". We combine lower income and middle/lower income into the group "lower income" because there are only four countries in our sample that qualify as lower income based on the original World Bank classification. We focus on six regions: North America, Western Europe, Asia, Eastern Europe, Latin America and Other. The "Other" region is South Africa and Israel.

discussed in Section 2.2, except the net flows measures of surges and stops are defined as periods when net capital inflows are above or below the threshold, respectively, while the episodes defined using gross flows are periods when gross inflows are above or below the threshold.

During the height of the GFC, net flows data identify more surge episodes and fewer stop episodes. The left half of Table 2 shows that measures based on net flows identify twelve surges from 2008 Q4 to 2009 Q1, while gross flows data identify only one surge (Bolivia, for whom a surge that began in 2007 was ending in 2008 Q4). For stops (the right half of the table), net flows identify about half as many episodes as gross flows (23 stop episodes based on net flows versus 48 based on gross flows). The reason for the disparity is that during the GFC many countries' residents retrenched from foreign markets, bringing money home. In fact, each country defined as having a surge episode based on the net flow data—but not using the gross data—had a retrenchment episode. The sudden inflow of capital as domestic investors sold their foreign holdings and brought the money home is classified as "retrenchment" in our definitions based on gross flows, but if the retrenchment outweighs actions by foreign investors, it can show up as a "surge" using the older net flows methodology. Similarly, most of the countries identified as having a stop episode based on the gross data, but not the net data, also had a large retrenchment in capital flows. Foreigners did pull back from these countries—gross inflows slowed—but the retrenchment by domestic investors counteracted the sudden stop of investment. Even though the foreign capital inflows suddenly stopped, retrenchment meant that net capital flows did not fall enough to qualify as a "sudden stop" episode based on the older methodology.

To clarify these differences, Figure 1 shows gross and net capital flows for Chile, a country that during the GFC had a surge episode based on net capital flows (but not gross flows) and a stop based on gross (but not net) capital flows. The figure shows that during the GFC, gross inflows suddenly dropped to almost zero, while the magnitude of gross outflows also fell sharply, reflecting a retrenchment as domestic investors brought money home (or ceased to send money abroad). The retrenchment by domestic investors outweighed the stop in capital inflows by foreign investors. Episodes identified using net capital flow data would describe this as a "surge", while gross capital flow data would instead define this period as a "stop" in foreign capital inflows combined with a "retrenchment" by domestic investors.

3. What Explains the Episodes? Preliminary Evidence

The previous section identified surge, stop, flight and retrenchment episodes in our sample of 58 countries. What causes these episodes? Are global, contagion, or domestic characteristics important in

determining the occurrence of waves in capital flows? This section first briefly discusses the theoretical literature providing different explanations for extreme movements in capital flows. It then provides a descriptive analysis of the relevant trends and patterns in the data. Finally, it performs an initial regression analysis to test for the roles of global, regional and domestic factors in causing each type of episode.

3.1 The Theory

Any model of international capital flows must assume, at least implicitly, some heterogeneity across agents. If everyone were identical, upon the realization of a shock there would be no need to trade. Asset prices would adjust, as might portfolio weights, but international capital flows need not occur. But everyone is not identical. In the theoretical literature explaining international capital flows, the necessary heterogeneity can emerge from many sources, including (but not limited to) information asymmetries, risk, and financial sector development.[17]

The analysis in this paper is related to a number of different literatures, including work on the cross-country allocation of investment, on contagion through capital flows, on capital flow cycles, and on the causes of specific episodes such as lending booms, sudden stops, and financial crises.[18] Each of these literatures is extensive. A major theme that runs through each is whether the forces driving capital flows are "push" factors that are external to the country (including global or contagion effects) or domestic "pull" factors.

Much of the recent literature on the GFC has focused on "push" factors driving capital flows, and especially on the role of four (related) global factors: risk, liquidity, interest rates, and growth. First, several papers develop theoretical models highlighting the role of changes in global risk or risk appetite, usually caused by a technology shock or a change in the probability of a disaster.[19] Second, several papers focus on how an initial change in global liquidity can be amplified due to bank-run type models and/or to rapid changes in global leverage, either of which can cause sudden shifts in capital flows.[20]

[17] See, for example, Brennan and Cao (1997), Dumas, Lewis, and Osambela (2010), Tille and van Wincoop (2011), Gourio, Siemer, and Verdelhan (2010), Mendoza, Quadrini, and Rios-Rull (2009), and Caballero, Farhi, and Gourinchas (2008).
[18] For examples of empirical analyses of the cross-country allocation of investment, see Burger, Warnock and Warnock (2010), Forbes (2010), Leuz, Lins and Warnock (2009), Lane and Milesi-Ferretti (2008), Lane (2006), Aggarwal, Klapper and Wysocki (2005), Bertaut and Kole (2004), Edison and Warnock (2004), and Faruqee, Li and Yan (2004).
[19] See Gourio, Siemer and Verdelhan (2010), Bacchetta and Van Wincoop (2010), Dedola and Lombardo (2010), Devereux and Yetman (2010), and Blanchard, Das and Faruqee (2010).
[20] See Devereux and Yetman (2010), Calvo (2009), Giannetti (2007), Kalemli-Ozcan, Papaioannou, and Perri (2010), and Brunnermeier (2009).

Third, an older series of papers, such as Calvo, Leiderman and Reinhart (1993, 1996), and Fernandez-Arias (1996), focuses directly on the role of global interest rates in affecting capital flows through portfolio channels or through default probabilities. A final focus of several papers, whether embedded in the models mentioned above or modeled directly, highlights the role of changes in global growth, often caused by global productivity shocks, in driving capital flows (see Albuquerque, Loayza and Serven, 2005). All of these models focus on the role of global factors and include little or no role for domestic factors in causing crises or sudden changes in capital flows. This approach has recently been popular due to the finding in papers such as Rose and Spiegel (2009) that individual country exposure to U.S. assets and trade was insignificant in determining how each country was affected by the 2008 crisis.

In addition to these global factors, contagion effects are another set of "push" factors outside a country's control that could influence a country's capital flows. These are generally defined as factors resulting from circumstances in another country or group of countries (but not the entire world). The literature on contagion has identified a wide variety of reasons why events in one country can spread to other countries; summaries of these models and explanations for contagion are captured in Claessens, Dornbusch and Park (2001) and Claessens and Forbes (2001). The various transmission mechanisms can be broadly broken into three categories: contagion through trade channels (which include direct trade, competition in third markets, and changes in import prices), contagion through financial channels (including through bank lending or portfolio flows), and contagion due to "country similarities" (such as a shared regional location or similar macroeconomic characteristics).[21] A number of papers assess the relative importance of each of these mechanisms in explaining why a crisis spreads from one country to another, such as Blanchard, Das, and Faruquee (2010), Forbes (2004), and Van Rijckgehem and Weder (2001), with different papers highlighting the role of different transmission channels.

In contrast to the papers that focus on "push" factors through contagion or global effects in driving capital flows, another literature emphasizes the importance of "pull" factors. These pull factors can include a range of different domestic fundamentals, four of which have received either greater focus in the theoretical literature or stronger empirical support. First, the theoretical literature has recently highlighted the size, depth and fragility of a country's financial system in either attracting capital flows from abroad (for developed financial markets) or driving capital flows out of the country (for less

[21] For papers that focus on contagion through trade, see Glick and Rose (1999) and Forbes (2002), and Abeysinghe and Forbes (2005). For papers that focus on the role of financial linkages, see Peek and Rosengreen (1997), Kaminsky, Lyons and Schmukler (2001), and Broner, Gelos and Reinhart (2006).

developed financial markets).[22] Second, the extent of financial market liberalization and integration with global financial markets can be an important factor determining capital flow movements.[23] Third, the country's fiscal position and overall risk of a debt crisis can be important in attracting capital flows as well as causing sudden stops in capital flows. Finally, business cycle models highlight how productivity or terms-of-trade shocks affect growth and in turn generate lending booms and busts and corresponding shifts in capital flows (as in Aguiar and Gopinath, 2007 for a theoretical model and Broner et al., 2010 for an empirical assessment).

A number of papers have also tried to tie together pieces of these various literatures by simultaneously analyzing the role of various push and pull factors during certain periods or to explain certain types of capital flow episodes. For example, Calvo, Leiderman and Reinhart (1996) focus on the surge in capital inflows into emerging markets in the early 1990's and argue that although this was initially attributed to domestic developments (such as better policies and economic performance), the more important driver was global factors, especially cyclical movements in interest rates. Calvo, Leiderman, and Reinhart (1993) and Chuhan, Claessens, and Mamingi (1998) also argue that 'push' factors are more important than domestic fundamentals in driving waves of capital inflows and outflows. Griffin, Nardari and Stulz (2004) analyze the role of domestic and global equity market performance empirically and in a theoretical model and argue that both are important in understanding cross-border equity flows. Chinn and Forbes (2004) find a role for global as well as contagion effects. Dungey et al. (2011), one of the few analyses that simultaneously considers the role of domestic, contagion and global factors in explaining crises, finds a role for all three channels, although global market factors often outweigh contagion effects.

The analysis in this paper helps evaluate the importance of global, contagion, and domestic factors in driving waves in capital flows. It also takes this analysis one step further by not only testing for the role of the three broad factors, but also disaggregating each factor into underlying components. The literature suggests that the global factor can be divided into effects due to global changes in risk, liquidity, interest rates, and growth; the contagion factor can be divided into effects due to trade linkages, financial linkages, and geographic proximity; and the domestic factor can be divided into

[22] For theoretical models of this effect, see Bacchetta and Benhima (2010), Ju and Wei (2011), Caballero et al. (2008), and Mendoza, Quadrini, and Rios-Rull (2009). For empirical support, see Forbes (2010) and Mendoza and Terrones (2008).
[23] See Milesi-Ferretti and Tille (2010), Calvo, Izquierdo, and Mejía (2008), and Aghion, Bacchetta and Banerjee (2004). Some of this literature argues that this relationship is nonlinear; as countries become more integrated with global financial markets, capital flow volatility will initially increase and then decrease.

effects due to the country's financial market development, integration with global financial markets, fiscal position, and growth shocks. Our empirical analysis will therefore help shed light on the relevance of the different theoretical approaches and specific models, and especially whether the recent focus on purely global shocks due to changes in risk or liquidity are, in fact, the appropriate framework to understand sudden shifts in capital flows.

3.2 The Evidence: Descriptive

To better understand the role of global, contagion, and domestic effects in driving capital flow episodes, this section begins by discussing trends and patterns and in the data. Are the patterns consistent with an important role for global factors (that is, are there simultaneous waves of episodes across a wide range of countries)? Or are episodes dispersed across time in ways that suggest important regional or country-specific factors?

Figure 3 shows the evolution of the incidence of each type of episode, broken down by income group. Most episodes are in high income countries, especially in the earlier years of the sample, which is not surprising as these are the countries that have more complete historical data. More importantly, these graphs show waves in the incidence of capital flow episodes, with large swings in the percent of the sample experiencing an episode. In some years no countries experience a stop or a retrenchment, while at other times a majority of the sample experiences these episodes. These cycles appear to support models that have an important role for global factors. The figure also shows an unprecedented number of countries experiencing stops and retrenchment during the GFC.

This retrenchment effect is not unique to the crisis of 2008-2009 and has happened during other periods, although never before has it occurred in so many countries at the same time. With so many countries retrenching during the GFC, it is not surprising that there was a spike in the incidence of sudden stops to 78% of the sample in the 4th quarter or 2008; if most countries are retrenching, gross inflows by foreigners will also fall in most countries. The historical patterns, however, suggest that this strong correlation between stops and retrenchment does not exist during all crises. For example, in 1998q4 after the collapse of LTCM the incidence of stop and retrenchment episodes were elevated (at 35% and 20%, respectively). But as economic risk abated, by the 3rd quarter of 1999 the number of retrenchment episodes declined rapidly to 2%, while the number of stop episodes fell more slowly to 15%.

Next, to get a better sense of whether contagion factors, as well as global factors, are important in understanding the incidence of episodes across time, Figure 4 divides the sample by region instead of income group. Many of the capital flow cycles appear to be dominated by trends in Western Europe, which is not surprising as this region encompasses a large number of countries with more complete data coverage. This graph also shows preliminary evidence of regional patterns, possibly indicating the role of common regional characteristics or other forms of contagion in explaining these episodes. For example, over half of Eastern Europe experienced surges in the first quarter of 2003.

Figures 3 and 4 suggest that global and possibly regional factors are important in causing episodes. A finer look at the episodes by country, however, suggests that domestic fundamentals may also play some role. For example, even though a majority of the sample experienced a retrenchment episode during the GFC, there are important differences across countries and some countries' residents did not unwind foreign positions and bring money home. During late 2008 and early 2009, there was more concern about the outlook for Eastern Europe and Poland than for Greece; Poland, however, experienced a retrenchment episode as Polish citizens brought a substantial amount of money home, while Greek citizens sent their money abroad. Other countries that did not have a retrenchment episode during this period include Argentina, Australia, Brazil, India, New Zealand, Norway, Portugal, Romania, Russia, the Slovak Republic, South Africa, and Turkey. What caused these differences? Different patterns across countries—even for countries in the same region—suggest that even in the presence of substantial global shocks and possibly regional contagion, domestic characteristics can also be important in determining whether a country experiences a surge, stop, flight or retrenchment episode.

3.3 The Evidence: Regression Analysis

This section more formally assesses the role of global, contagion and domestic factors in determining the conditional probability of having a surge, stop, flight or retrenchment episode in a given quarter.

We estimate the model:

$$Prob(e_{it} = 1) = F(\beta_1 \phi_{t-1} + \beta_2 \gamma_{i,t-1} + \alpha_i) \quad (5)$$

where e_{it} is an episode dummy variable that takes the value of 1 if country i is experiencing an episode (surge, stop, flight or retrenchment) in quarter t; ϕ_{t-1} is a measure of the global factor lagged by one

quarter; $\gamma_{i,t-1}$ is a contagion variable that is equal to 1 if there is the same type of episode for another country in the region in the previous quarter; and α_i are country dummy variables. The appropriate methodology to estimate equation (5) is determined by the distribution of the cumulative distribution function, $F(\cdot)$. Because episodes occur irregularly (about 85 percent of the sample of episodes is zeros), $F(\cdot)$ is asymmetric. Therefore we estimate equation (5) using the complementary logarithmic (or cloglog) framework, which assumes that $F(\cdot)$ is the cumulative distribution function (cdf) of the extreme value distribution.[24] In other words, this estimation strategy assumes that:

$$F(z) = 1 - exp[-exp(z)] \quad . \tag{6}$$

While we estimate each type of episode separately, we use a seemingly unrelated estimation technique that allows for cross-episode correlation in the error terms. This captures the fact that the covariance matrix across episodes is not zero, without assuming a structural model specifying a relationship between episodes. We also cluster the standard errors by country.

One important question is how to measure the global factor. For our initial analysis, we measure the global factor as the Volatility Index (VXO) calculated by the Chicago Board Options Exchange.[25] This measures implied volatility using prices for a range of options on the S&P 100 index and is generally interpreted as capturing overall "economic uncertainty" or "risk", including both the riskiness of financial assets as well as investor risk aversion. To simplify the following discussion, we will refer to periods of global "calm" as periods when the VXO is low, and periods of global "volatility" when the index is high.

Table 3 reports results for the complementary logarithmic regressions of equation 5 to test for the role of global, contagion, and domestic factors in explaining surge, stop, flight and retrenchment episodes. Probit and logit estimators yield very similar results. The row labeled "Country dummies" reports results of a χ^2 test for the joint significance of the country dummy variables. The coefficient estimates in the table indicate the direction and significance of the global and regional factors in

[24] Caballero (2010) also uses this approach. Earlier work uses a Logit or Probit model which assumes that the distribution of $F(\cdot)$ is logistic or normal, respectively, and therefore symmetric around zero.

[25] The VXO, as the old VIX is now known, is similar to the better-known VIX. The VIX is calculated using a broader set of prices, but is only available starting in 1990. Table 5a shows that the correlation between the two measures is 99%, so we focus on the VXO for our baseline analysis in order to maximize sample size. See Section 4.2 for more detailed discussion of risk measures.

explaining different episodes. Interpreting the magnitude of the coefficients is not straightforward, however, because interpretation depends on the slope of the cumulative distribution function. Therefore, to get a better sense of the magnitude of these estimates, it is also useful to consider the exponentiated coefficients.[26] For the complementary logarithmic function, the relevant exponentiated coefficient is the hazard ratio, which is calculated as:

$$h = Pr(y=1|X) \,/\, Pr(y=0|X) \,. \qquad (7)$$

The hazard ratio in equation (7) is the probability of a positive outcome compared to the probability of no positive outcome. These hazard ratios are reported in brackets below the standard errors for each coefficient on Table 3 and show the marginal effects in multiplicative form after controlling for differences in the baseline odds of a crisis for each country. The coefficient estimates and χ^2 tests for the country dummies in Table 3 are each highly significant, indicating roles for global, regional, and domestic factors in determining the incidence of surges, stops, flight and retrenchment across countries.

The positive and significant coefficients on the contagion variable for each of the four episodes support a strong role for contagion effects. A country has a higher probability of a particular type of extreme capital flow episode when a neighboring country had that type of episode in the previous quarter. The hazard ratios suggest that the effect of contagion may be larger for surges and stops than for flight and retrenchment episodes. The country dummy variables are also jointly highly significant in each specification, indicating a role for domestic effects.

For the global factors, the coefficient estimates are all highly significant. The significant positive coefficients in regressions predicting stops and retrenchment indicate that capital is more likely to "stop" going into countries from abroad and domestic citizens are more likely to bring investment back home during periods of high global volatility. The negative and significant coefficient on the global factor in regressions predicting surges indicates that capital is more likely to "surge" into countries from abroad during periods of global calm. Finally, flight episodes occur not during periods of heightened global risk, but rather during calm episodes. The hazard ratios (reported in brackets) suggest that the effect of an increase in global volatility on the probability of each type of event is similar.

[26] For example, when interpreting coefficients for a Logit regression, it is useful to examine the exponentiated coefficient calculated as the odds ratio (p/1-p), with $p=Pr(y = 1/X)$ the probability of a positive outcome.

We have repeated all of the estimates reported above using different variable definitions for the global factor and using different approaches to identify the episodes of surges, stops, flight and retrenchment. These sensitivity tests are described in more detail in Section 4.3. The main results reported above are highly robust. In almost all cases, the global, contagion, and domestic factors are significant (usually at the 5% level and always at the 10% level) in predicting surges, stops, flight and retrenchment episodes for the full sample of countries. The only exception is when proxies for net capital flows are used to define surge and stop episodes, as reported on the right of Table 3. Using this older approach for defining the episodes, the global and contagion factors are no longer significant in predicting surges and the magnitude of the effect of the contagion factors in predicting stops is smaller. This supports the discussion in Section 2 that focusing on net capital flows instead of gross capital flows may miss important dynamics in understanding capital flow movements.

We also tested for different effects for high-, middle-, and low-income countries. The main difference across income groups is that lower income countries are less likely to experience retrenchment episodes during periods of heightened global risk, and also less likely to experience retrenchment when their neighbors had a retrenchment episode in the last quarter. Even more noteworthy than these differences between countries of different income groups, however, are the similarities. There is no significant difference in the role of global and contagion factors in explaining surge and stop episodes. This suggests that it is not just middle and/or low income countries that are subject to these sudden increases in capital flows from abroad—although this does not present any evidence on the different types of countries' ability to adjust to these flows. Moreover, the coefficients on the global factor are not significantly different for high and middle income countries for each of the episodes. This suggests that both foreign and domestic investors respond in similar ways toward each set of countries to changes in global volatility. Domestic investors are just as likely in high and middle income countries to send money abroad during periods of low risk aversion and to bring money home during periods of heightened volatility.

To summarize, all types of capital flow episodes appear to have some global, contagion and domestic components. Surge and flight episodes occur when global conditions are calm, while stops and retrenchments occur during more volatility. But what explains the global, contagion, and domestic effects? Are global effects due to changes in risk aversion, liquidity, interest rates or global growth? Are contagion effects due to trade or financial links or geographic proximity? What country characteristics are most important?

4. What Explains the Episodes? Disaggregating the Global, Contagion and Domestic Factors

The literature review in Section 3.1 suggests that the global, contagion and domestic factors explaining capital flow waves could each be further decomposed into more specific variables. This section disaggregates these factors into various subcomponents and tests for the role of individual variables in explaining surges, stops, flight and retrenchments. After the initial regression analysis, this section takes a closer look at key results related to the role of risk and capital controls in explaining episodes. Then it performs a series of sensitivity tests and finally summarizes the key results that are consistent across these tests.

4.1 Base Regression Analysis

Theory and empirical research suggests that the global factor can be divided into effects due to global risk, liquidity, interest rates, and growth. The contagion factor can be divided into effects due to trade linkages, financial linkages, and geographic location and the domestic factor can be divided into effects due to the country's financial market development, integration with global financial markets, fiscal position, and growth shocks.

There are a number of variables that could be used for each factor. We focus on measures that are available over the full sample period (1985 to 2009) and for most countries in the sample. Also, each variable is lagged by one quarter unless noted otherwise.[27] Beginning with the global variables, to measure global risk we continue to use the Volatility Index or VXO, which incorporates both overall uncertainty as well as risk aversion.[28] To measure global liquidity we use the year-over-year growth in the global money supply, with the global money supply calculated as the sum of M2 in the United States, Euro-zone and Japan and M4 in the United Kingdom, all converted into US dollars and as reported in the IFS. Global interest rates are measured using the average rate on long-term government bonds in the United States, core euro area and Japan (as reported in the IMF's *International Financial* Statistics or IFS) and global growth shocks are measured by quarterly global growth in real economic activity (from the IFS).

[27] Most of the variables are available quarterly. For market statistics that are available at a higher frequency, we use quarterly averages. Economic statistics that are only available on an annual basis are calculated by approximating quarterly values based on the annual frequencies.

[28] Section 4.2 includes a detailed discussion and sensitivity tests with alternative measures of risk.

To measure the contagion variables, we continue to use a measure of geographic proximity, with a dummy variable equal to one if a country in the same region has an episode in the previous quarter. We also calculate the trade linkages (TL) and financial linkages (FL) between countries as:

$$TL_{xt} = \sum_{i=1}^{n} \left(\frac{Exports_{xi,t-1}}{GDP_{x,t-1}} * Episode_{i,t-1} \right) \tag{8}$$

$$FL_{xt} = \sum_{i=1}^{n} \left(\frac{Bank_{xi,t-1}}{GDP_{x,t-1}} * Episode_{i,t-1} \right) , \tag{9}$$

where $Exports_{xi,\,t-1}$ is exports from country x to country i in the previous quarter (t-1) from the IMF's Direction of Trade Statistics, $Bank_{xi,\,t-1}$ is banking claims between countries x and i in the previous quarter, $GDP_{x,\,t-1}$ is GDP for country x in the previous quarter (to capture the relative importance of trade and banking in the economy), and $Episode_{i,\,t-1}$ =1 if country i had an episode in the last quarter. Both measures are calculated for each country x for each type of episode (surge, stop, flight, and retrenchment).[29]

To capture the country effects we use a number of the variables. We measure the depth of the financial system as the sum of each country's stock market capitalization divided by GDP from Beck and Demirgüç-Kunt (2009); in robustness tests we use a broader measure only available for a smaller sample. We measure capital controls/financial market integration with a broad measure of the country's capital controls as calculated in Chinn and Ito (2008).[30] This statistic is one of the few measures of

[29] The underlying banking data for $Bank_{xi}$ was provided by Patrick McGuire at the Bank of International Settlements. While no measure of financial linkages is perfect (Cecchetti, Fender, and McGuire 2010), we focus on banking data because it is the only cross-country financial data that is of reasonable quality and widely available across countries and time periods. Specifically, $BANK_{xi}$ is total bank claims between country x and BIS reporting country i. Some i countries (US, UK, Netherlands and Japan) are reported individually, but for confidentiality reasons other countries are reported to us only by group (with the groupings being AT CY GR IE PT, BE LU, FR DE IT ES, FI DK NO SE, HK MO SG BH, BS BM KY AN PA, GG IM JE, BR CL MX, TR ZA, TW IN MY KR, CH AU CA). When an i country is only recorded in a group, $BANK_{xi}$ is scaled by the share of the country's GDP in the group.

[30] We focus on the KAOPEN measure of capital controls in Chinn and Ito (2008), updated in April 2011. KAOPEN is based on the principal components from four binary variables reported by the IMF: (1) the openness of a country's capital account; (2) the openness of the current account; (3) the stringency of requirements for the repatriation and/or surrender of export proceeds; and (4) the existence of multiple exchange rates for capital account transactions. In order to be consistent with other measures of capital controls in the sensitivity analysis, we reverse the sign so that a positive value indicates greater controls.

capital controls available back to 1985 for a broad sample of countries. Real GDP growth is from the IFS, and we measure the growth shock as the deviation between actual growth and the country's trend growth. We measure country indebtedness as public debt to GDP from the new database described in Abbas, Belhocine, ElGanainy and Horton (2010). We also include a control for GDP per capita.[31]

Regression results estimating the effect of these global, contagion, and country factors on the conditional probability of having a surge, stop, flight or retrenchment episode are reported in Table 4. We continue to use the complementary logarithmic estimator described in Section 3.3, with adjustments for covariances across episodes and robust standard errors clustered by country. We focus on results without country fixed effects, but in the sensitivity analysis we show that the key results are robust to the inclusion of fixed effects.[32]

Table 4 shows a number of noteworthy results. The variable that is significant in predicting most types of episodes is global risk. Higher levels of global risk are negatively correlated with surges and flight, and positively correlated with stops and retrenchment. Contagion through financial exposure is significant in explaining stops and retrenchment, and contagion due to regional location and trade flows is significant in predicting stops and retrenchment, respectively. This suggests that contagion is an important factor causing investors to stop investing abroad and to return money home, but less important in causing domestic or foreign investors to send money abroad. Global growth and domestic growth shocks are both highly significant in explaining surges and stops, but not flight and retrenchment episodes. This suggests that stronger global growth makes foreigners more likely to invest abroad, and stronger growth in an individual country increases the probability that the country receives a surge of foreign capital inflows. In contrast, stronger global and domestic growth appear to have less effect on whether domestic investors send money abroad or sell foreign investments to bring money home.

Just as noteworthy as the significant variables in Table 4 are those that are usually insignificant. There is no evidence that capital controls reduce a country's likelihood of having a surge or stop episode, and therefore controls do not seem to reduce the volatility of foreign capital flows. Capital controls may increase the probability of domestic investors sending money abroad (a flight episode), but

[31] All country-level variables, except for the index of capital controls and GDP per capita, are winsorized at the 1% level to alleviate the impact of extreme outliers.

[32] These country dummy variables should not be needed if we were able to capture all of the country-specific factors determining whether a country has an episode in the specification. These dummy variables are usually jointly significant, however, indicating that we are (not surprisingly) unable to capture all country factors that determine the incidence of an episode. Including these fixed effects, however, could cause a downward bias on coefficient estimates for country-specific variables that have a significant effect on the probability of an episode but are fairly constant over the sample period.

this result is only marginally significant and has fluctuating significance in the sensitivity tests discussed below. Also noteworthy is that global liquidity and global interest rates are not significantly correlated with most episodes (except higher global interest rates may increase the probability of having a retrenchment episode); this does not support the general assumption that low interest rates or a large increase in liquidity in the major economies (such as quantitative easing in the United States) is the primary factor driving surges in other economies.

4.2 A Closer Look at Global Risk and Capital Controls

Two of the key results from this analysis are the significance of global risk and insignificance of capital controls in explaining large movements in capital inflows and outflows by both domestic and foreign investors. This section looks more closely at these results.

The finding that global risk is the most consistently significant factor driving capital flow episodes has important implications not only for understanding capital flow movements, but also for differentiating between theoretical approaches explaining these movements. To better understand this role of risk, we test for the impact of using four different measures of risk (in addition to our baseline measure of the VXO): the VIX[33], the Quality Spread (the difference between Moody's Baa and Aaa corporate bond yields), the CSFB Risk Appetite Index (RAI),[34] and the Variance Risk Premium (VRP).[35] The most common measures of risk—such as the VXO, the VIX and the Quality Spread—capture both economic uncertainty as well as risk aversion. The RAI and VRP, however, are constructed with the aim of capturing only risk aversion (or risk appetite) while controlling for overall risk and uncertainty. Misina (2003) shows, however, that the methodology used to construct the RAI may not control for changes in overall risk unless a strict set of theoretical conditions are met.[36] In contrast, the

[33] See section 3.3 for details on the VXO and VIX.

[34] The RAI is the beta coefficient of a cross-sectional regression of a series of risk-adjusted asset price returns in several countries on the past variance of these assets. This calculation is based on 64 global assets, including equities and bonds for all developed countries and the major emerging markets. If the beta is positive, it means that the price of riskier assets is rising relative to the price of safer assets, so risk appetite among investors is higher. For more information, see "Global Risk Appetite Index" a Market Focus Report by Credit Suisse First Boston (February 20, 2004). To simplify comparisons with the other risk measures, we reverse the sign of the index.

[35] The VRP is the difference between the risk-neutral and objective expectations of realized variance, where the risk-neutral expectation of variance is measured as the end-of-month observation of VIX-squared and de-annualized and the realized variance is the sum of squared 5-minute log returns of the S&P 500 index over the month. Both variance measures are of monthly basis in percentage-squared and are available in real time at the end of the observation month. See Zhou (2010).

[36] More specifically, Misina (2003) shows that the risk appetite index will measure risk aversion only in the presence of a rank effect in which the key condition is the linear independence of asset returns used to construct the index. This assumption is unlikely to hold in practice.

VRP index is based on a less rigid set of assumptions and therefore is a more accurate measure of risk aversion independent of expectations of future volatility (i.e., future risk). The disadvantage of the VRP (as well as the VIX) is that it is only available starting in 1990.

Table 5a shows the correlation between these different risk measures and Table 6a reports the estimated coefficients on the risk variable if the base regression reported in Table 4 is repeated with one of these alternative measures of risk. These results suggest that when broad measures of risk that capture both changes in economic uncertainty as well as changes in risk aversion are used, higher levels of risk are positively correlated with stop and retrenchment episodes and negatively correlated with surges. The correlation between global risk and flight episodes, however, is usually insignificant. Moreover, the insignificant coefficient for regressions predicting surges when risk is measured primarily by changes in risk aversion (controlling for changes in economic uncertainty) suggests that lower levels of uncertainty are more important in driving surges. The positive and significant coefficients on the RAI and VRP measures when predicting stops suggest that higher risk aversion (and not just increased economic uncertainty) is an important factor determining stop episodes.

A second key result from the full regressions in Table 4 is that a country's capital controls appeared to be insignificant in predicting the conditional probability of surge, stop, flight and retrenchment episodes. This does not support the recent interest in capital controls as a means of reducing surges of capital flows and overall capital flow volatility. To further explore this result, we utilize several different measures of capital controls and integration with global financial markets. First, instead of a direct *de jure* measure of capital controls, we use a broad *de facto* measure of financial integration--the sum of foreign assets and liabilities divided by GDP.[37] Second, we consider a broad measure of capital account restrictions from Schindler (2009) that is only available from 1995 to 2005. Third, we use more specific measures of capital account restrictions from the same source and time period, but which measure only restrictions on inflows or outflows by foreigner or domestic investors.[38] Finally, we also use two new indices of capital controls from Ostry, Ghosh, Chamon and Qureshi

[37] The financial integration data is from an updated and extended version of the dataset constructed by Lane and Milesi-Ferretti (2007), available at: http://www.philiplane.org/EWN.html.

[38] More specifically, for regressions predicting surges and stops we include the index of controls on local purchases and sales, respectively, by nonresidents. For regressions predicting flight and retrenchments we use the index of controls on purchases or sales abroad, respectively, by residents.

(2011). These indices measure capital controls in the financial sector and regulations on foreign exchange.[39]

Table 5b shows the correlations between the different measures of controls. The low correlations between many of these statistics highlights the challenges in accurately measuring capital controls. Table 6b shows the coefficient estimates on each of these capital control measures when we repeat the base regression from Table 4 except use an alternative measure of controls (or financial integration). The coefficients on capital controls continue to be insignificant in most cases, even for the much more detailed measures. The only coefficient that is significant at the 5 percent level is when financial integration is measured by international exposure through the country's foreign assets and liabilities instead of measuring capital controls directly. This significant coefficient estimate, however, suggests that countries more integrated with global financial markets are less likely to experience stop episodes—providing little support that limiting financial integration will reduce a country's vulnerability to sudden stops.

4.3 Sensitivity Tests

We also do an extensive series of sensitivity tests of these results, focusing on different time dimensions and estimation strategies, including additional control variables, using different measures for the control variables, and calculating the episodes using different techniques.

We begin by testing if the estimates are driven by the extreme volatility during the recent crisis (as shown in Figures 3 and 4) by dropping the crisis period (2008Q3 through 2009Q2) from the sample. We also estimate each of the equations using fixed effects. This strategy controls for each country's fixed characteristics over the sample period and therefore estimates how changes in each domestic variable from its mean for each country affects the probability of each country having a surge, stop, flight or retrenchment in each quarter. This is a different question than for the estimates that do not include fixed effects and which instead estimate the effect of the level of each domestic characteristic (rather than the change from the country mean) on the probability of the country having an episode in

[39] The measure of capital controls in the financial sector includes: (i) restrictions on borrowing abroad; (ii) restrictions on maintenance of accounts abroad; and (iii) differential treatment of accounts held by nonresidents. The index of foreign exchange regulations include: (i) restriction on lending locally in foreign currency; (ii) purchase of locally issued securities denominated in foreign currency; (iii) differential treatment of accounts held by nonresidents; and (iv) limits on open foreign exchange positions.

any quarter. We also estimate the main model using a standard probit and logit estimation (instead of the cloglog) and estimate each equation in isolation instead of as part of system estimation.

For the next set of sensitivity tests, we include a series of additional control variables in the base regressions to test if other factors could determine the probability of having a capital flow episode. First, a number of models focus on the role of demographics in driving capital flows, usually in an OLG framework, such as Brooks (2003), Domeij and Flodén (2006) and Krueger and Ludwig (2007).[40] Therefore, we follow Chinn and Prasad (2003) and include two controls for demographic trends—the "youth dependency ratio" and "old dependency ratio" defined as the population aged under 15 or over 65 respectively, both divided by the population aged 15 to 65. Second we include a dummy variable equal to one if the country has a pegged exchange rate, based on the exchange rate classification in Shambaugh (2004).[41] Third, we include a measure of the country's credit rating to capture country risk that may not be captured in its debt ratio and other measures. We use the country's Moody's or S&P rating, with a numerical value assigned to each rating and a lower value indicating a higher ranking.[42] Fourth, we add a control for the country's terms-of-trade as measured by the World Bank's "Net Barter Terms of Trade Index". Finally, we control for a country's level of reserves to GDP.[43]

Then we use a number of different measures for the control variables (in addition to the different measures of risk and capital controls discussed above). First, to measure global interest rates, instead of using the average rate on long-term government bonds in the United States, euro area and Japan, we simply use the rate for the United States. Second, to measure global liquidity, we use private credit growth by deposit money banks and other financial institutions from Beck and Demirguç-Kunt (2009). Third, to measure the size of the financial system, instead of using just the country's stock market capitalization to GDP, we use the sum of the countries stock market capitalization and private and public bond market capitalization to GDP (which limits the sample size). Fourth, to measure the strength of a country's financial system instead of its size, we use the return on equity for the banking system (also from Beck and Demirgüç-Kunt, 2009). Fifth, instead of measuring domestic productivity shocks as the

[40] We do not include a demographic variable in the main analysis as the theoretical and empirical work indicates that demographics affects capital flows over the medium and long term, but not necessarily over the shorter periods which are the focus of this paper.
[41] Updated classification data was kindly provided by the author. A country is classified as having a pegged exchange rate if it (a) has no fluctuation at all; (b) moves within 2% bands; or (3) has a one-time devaluation with 0% change after 11 months.
[42] For example, for Moody's an "aaa" rating is scored as a 1, a "aa1" rating is scored as a 2, etc. In each case a 1 is the lowest rating. Cantor and Packer (1996) show "that sovereign ratings effectively summarize and supplement the information contained in macroeconomic indicators."
[43] Data from 2000 to 2010 is the sum of monthly reserve data as reported by the IMF. Data from before 2000 is from Lane and Milesi-Ferretti (2007) and the annual data is quarterized.

country's GDP growth versus a historic trend, we measure the shock versus growth as forecast in the spring WEO. Finally, we also exclude the control for GDP per capita.

As a final series of sensitivity tests, we implement different techniques for identifying the episodes of surges, stops, flight and retrenchment. First, instead of a historic moving average to calculate the episodes, we use an HP filter with episodes defined by 30% deviations from the stochastic trend. Second, we use the ratio of capital inflows or outflows divided by country GDP, instead of simply capital inflows or outflows, to calculate each episode. Third, we use a three-standard deviation cutoff for changes in capital flows to qualify as an episode instead of the traditional two-standard deviation cutoff. Not surprisingly, this decreases the number of episodes. Fourth, we exclude transactions by the monetary authorities from the 3rd quarter of 2008 through the end of the sample in order to remove any effect of the currency swap arrangements by the Federal Reserve Board.[44] This has a minimal effect on the definitions of episodes. Fifth, we include reserves in our definition of outflows by domestic residents, which then measures official and private capital flows instead of just private flows. This can affect the definition of flight and retrenchment episodes. Finally, we calculate our measures for surge and stop episodes using the traditional approach of using net capital flow proxies instead of gross capital flows (as discussed in Section 2).

4.4 Summary: Disaggregating the Global, Contagion and Domestic Factors

The results of a sample of these sensitivity tests are reported in Appendix Tables 3a – 3d and confirm the results discussed above. The risk variable continues to be highly significant in predicting surge, stop and retrenchment episodes (although it is occasionally only significant at the 10 percent level or insignificant in predicting surges). Financial contagion and either regional or trade contagion continues to be highly significant in predicting stops and retrenchment (when investors stop investing abroad and bring money home). The global growth variable is usually (but not always) significant in predicting foreign capital flows, with higher global growth positively correlated with surges and negatively with stops. Higher global interest rates may increase the probability of having a stop or retrenchment episode, but the significance depends on the specification. The domestic variables show less consistent patterns and are more often insignificant. Domestic growth shocks tend to be negatively correlated with the probability of having stop episodes and positively correlated with surge episodes, although the coefficient for surges is not as consistently significant as for stops. Wealthier countries are

[44] See McGuire and von Peter (2009) for analysis of the swap arrangements.

also more likely to experience retrenchment episodes, although the significance of this relationship varies across specifications.

Just as noteworthy are the coefficient estimates that are generally insignificant. No variables are consistently significant in predicting flight episodes across countries. Global liquidity, capital controls, and debt ratios do not significantly affect the probability of having any type of episode. Global interest rates (whether measured as just U.S. rates or an average of major economies) and a country's financial system (whether measured by size or efficiency) do not have any significant relationship with surge or flight episodes.

This series of tests analyzing which global, contagion, and domestic factors cause surges, stops, flight and retrenchment episodes has yielded several results. First, the primary global factors driving the waves in capital flows—both by foreign and domestic investors—appears to global risk. This supports the focus of much of the recent theoretical literature that models how changes in global risk can be a key factor driving crises. This is also in line with Fratzscher (2011) which finds that global factors, and especially risk, account for a large share of global capital flow patterns immediately before and during the recent crisis. Global growth is also important in driving the surges and stops caused by changes in capital flows by foreigners. The results, however, generally do not support theoretical work or the widespread presumption that changes in interest rates or liquidity in a major economy, such as the United States, is the most important factor driving surges in capital flows. The results also find a significant role for financial contagion in explaining episodes when investors stop investing abroad and return money home.

There is no evidence that reduced integration with global financial markets, including through the use of capital controls, reduces a country's vulnerability to surges, stops and other capital flow episodes. If anything, there is evidence that greater integration reduces country vulnerability to stop episodes. The results find little evidence that a country's financial system—whether its size or soundness—is an important factor driving waves of capital flows, except possibly for stop episodes. This does not support a recent focus of the theoretical literature on global imbalances on the role of the financial system in driving capital inflows from abroad and outflows by domestic investors. Finally, the results find little role for a country's growth shocks in predicting capital flow episodes driven by domestic investors, although they may play a role in determining capital flow episodes driven by foreigners. This provides mixed support for the theoretical work focusing on domestic productivity shocks as key determinants of capital flows, such as the real business cycle literature.

5. Conclusions

This paper has developed a new methodology to analyze extreme movements in capital flows using data on both inflows and outflows by domestic and foreign investors. Compared to previous work that focused only on net capital flows, this new methodology yields substantially different definitions of periods of "surges" and "stops" in capital flows. The new methodology provides a more detailed disaggregation of capital flows, defining not only periods of surges and stops when foreign investors substantially increase or decrease capital flows to a country, but also periods of flight and retrenchment when domestic investors substantially increase or decrease their capital flows abroad. This more detailed disaggregation of capital flows is critically important to understand what drives capital flow waves.

The analysis finds a primary role for global factors, and especially global risk, in explaining periods of extreme capital flows by domestic and foreign investors. The impact of global risk on capital flows appears to work primarily through changes in economic uncertainty, although changes in risk aversion may also be important in explaining episodes when foreign capital inflows slow dramatically. Global growth is also important in driving capital flows by foreigners, although it has less impact on capital inflows and outflows by domestic investors. Contagion is important in explaining episodes when investors reduce investment abroad and return more money home. This contagion occurs through financial linkages between countries, and can also occur through regional location or through trade linkages. The results indicate a less important role for domestic factors in explaining episodes, although domestic growth shocks are usually important in determining the behavior of foreign investors. Predicting flight episodes, when domestic investors send more money abroad, is more difficult than predicting other types of extreme capital flow movements.

This series of results provides evidence on which approaches in the theoretical literature are most relevant to explaining capital flow waves. The significance of global risk in driving most capital flow episodes (although less so for flight) supports the recent focus in several theoretical papers on global risk as a primary factor driving crises. The results do not find a consistently significant role, independent of global risk and global growth, of global interest rates or global liquidity in causing episodes.[45] This does not support other theoretical models and the widespread presumption that changes in interest rates or liquidity in a major economy, such as the United States, are important factors driving surges in capital

[45] Bekaert, Hoerova and Duca (2010) find that a lax monetary policy decreases risk aversion after about five months, so it is possible that the risk measure may be capturing a lagged effect of monetary policy.

flows. Finally, the results also do not show a significant role of domestic growth shocks in determining the actions of domestic investors, although there is mixed evidence on whether these shocks influence foreign investors, thereby providing mixed support for theoretical work focusing on domestic productivity shocks as key determinants of capital flows (such as the real business cycle literature).

These results also have important implications for policymakers concerned about capital flow volatility. Waves of capital flows can present significant macroeconomic challenges, whether it is the waves of capital inflows that cause currency appreciation and/or asset bubbles or the "undertows" as capital flows out and causes a collapse in exchange rates and asset prices. One country characteristic that has recently received substantial support to reduce this volatility—capital controls—does not seem to significantly reduce the occurrence of surges, stops or other capital flow episodes. (If anything, less financial openness appears to increase the country's chance of having capital flight by domestic investors.) Most of the significant drivers of capital flow volatility—such as changes in global risk, global growth, and contagion—appear to be outside the control of policymakers in most countries,. This suggests that governments may wish to focus more on strengthening their country's ability to withstand capital flow volatility rather than to attempt to directly reduce this volatility. This also suggests an important role for global institutions and cross-country cooperation for policymakers that hope to reduce the sharp volatility of global capital flows.

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Table 1
Summary Statistics for Episodes (1980-2009)

		Surge	Stop	Flight	Retrenchment
		% of sample with			
Full sample		15%	18%	16%	17%
		Average length of time for each (in quarters)			
Full sample		4.5	4.0	4.1	3.8
By Income Group	High income	4.5	4.1	4.1	4.1
	Med income	4.6	3.8	4.3	3.3
	Low income	4.3	3.8	3.8	3.5
By Region	North America	3.8	3.9	3.8	3.8
	Western Europe	4.5	4.2	4.2	4.1
	Asia	4.5	4.0	4.1	4.0
	Eastern Europe	4.8	3.7	4.2	3.5
	Latin America	4.4	4.0	3.7	3.2
	Other	4.3	3.7	4.4	3.7

Notes: Income groups are based on World Bank definitions, with "Lower income" including both low income and middle/low income; "Middle income" is middle/high income; "Higher income" is high income.

Table 2
Episodes During the GFC Based on Net and Gross Capital Flows

The "Net Flows" columns show episodes based on the net inflows data, as used in the traditional sudden stops and bonanzas literature. The "Gross Flows" columns show episodes based on gross flows data, as in this paper. The difference between the two is that episodes based on net flows include the actions of domestic investors, who in many countries were retrenching during the crisis. The crisis is defined as the two quarters 2008Q4 and 2009Q1.

Surges		**Stops**		
Net Flows	**Gross Flows**	**Net Flows**	**Gross Flows**	
Belgium/Lux	Bolivia	Argentina	Argentina	Austria
Canada		Brazil	Brazil	Belgium/Lux
Chile		Estonia	Estonia	Canada
Finland		Guatemala	Guatemala	Chile
France		Iceland	Iceland	Colombia
Iceland		India	India	Czech Rep
Israel		Ireland	Ireland	Denmark
Netherlands		Korea	Korea	France
Sweden		Latvia	Latvia	Germany
Taiwan		Lithuania	Lithuania	Hong Kong
UK		Malaysia	Malaysia	Hungary
Venezuela		New Zealand	New Zealand	Israel
		Norway	Norway	Italy
		Peru	Peru	Japan
		Philippines	Philippines	Mexico
		Poland	Poland	Netherlands
		Romania	Romania	Nicaragua
		Russia	Russia	Panama
		South Africa	South Africa	Portugal
		Spain	Spain	Singapore
		Turkey	Turkey	Slovenia
		Croatia		Sweden
		Greece		Switzerland
				Taiwan
				Thailand
				UK
				US

Table 3
Regression Results: Episodes and Global, Regional & Country Factors

	Episodes based on Gross Flows				Episodes based on Net Flows	
	Surge	**Stop**	**Flight**	**Retrench**	**Surge**	**Stop**
Global factor	-0.042**	0.047**	-0.036**	0.046**	-0.007	0.016**
	(0.014)	(0.004)	(0.009)	(0.004)	(0.007)	(0.006)
	[0.958]	[1.048]	[0.965]	[1.047]	[0.993]	[1.016]
Contagion	0.962**	0.922**	0.523**	0.448**	-0.034	0.408**
	(0.429)	(0.142)	(0.229)	(0.169)	(0.160)	(0.157)
	[2.616]	[2.514]	[1.687]	[1.565]	[0.967]	[1.503]
Country dummies	Y**	Y**	Y**	Y**	Y**	Y**
Sample Size	***4,100***	***4,100***	***4,100***	***4,100***	***4,220***	***4,220***

Notes: The dependent variable is a 0-1 variable indicating if there is an episode (either surge, stop, flight or retrenchment). The columns labeled "Episodes based on Gross Flows" follow the methodology developed in this paper using gross flows to define the episodes, while the columns labeled "Episodes based on Net Flows" use previous methodology based on net capital flows. Global factor is measured as the VXO, lagged by one quarter. Regional contagion is a dummy variable equal to 1 if another country in the region had the same type of episode in the previous quarter. Country dummies indicates results of a χ^2 test for the equality of the country dummy variables. Estimates are obtained using the complementary logarithmic (or cloglog) framework which assumes that $F(\cdot)$ is the cumulative distribution function (cdf) of the extreme value distribution. To capture the covariance across episodes, the set of four episodes based on grows flows and two episodes based on net flows are each estimated using seemingly unrelated estimation with robust standard errors clustered by country. The hazard ratio, is reported in brackets below each estimate. ** is significant at the 5% level and * at the 10% level.

Table 4
Regression Results: Explaining the Global, Contagion and Domestic Factors

Global Factors	**Surge**	**Stop**	**Flight**	**Retrenchment**
Global risk	-0.036**	0.023**	-0.033*	0.015**
	(0.016)	(0.005)	(0.020)	(0.006)
Global liquidity	1.251	-0.977	-1.421	-0.175
	(1.068)	(1.125)	(1.205)	(1.071)
Global interest rates	0.022	0.059	-0.052	0.106**
	(0.052)	(0.037)	(0.072)	(0.046)
Global growth	26.174**	-6.914**	2.240	-4.540
	(9.919)	(2.877)	(6.501)	(3.075)
Contagion Factors				
Regional contagion	0.451*	0.372**	0.257	-0.245
	(0.262)	(0.141)	(0.192)	(0.187)
Trade contagion	5.039	3.688	1.194	8.771**
	(4.393)	(2.368)	(7.045)	(2.621)
Financial contagion	-1.438	4.193**	1.749	3.998**
	(1.488)	(0.879)	(2.565)	(0.998)
Domestic Factors				
Financial system	-0.016	0.262*	0.018	0.169
	(0.204)	(0.146)	(0.256)	(0.195)
Capital controls	-0.024	0.029	0.130*	0.034
	(0.069)	(0.057)	(0.071)	(0.061)
Debt to GDP	-0.006**	-0.002	-0.005**	-0.004
	(0.003)	(0.002)	(0.003)	(0.003)
Growth shock	1.413**	-3.253**	0.524	-0.101
	(0.648)	(1.060)	(0.806)	(0.939)
GDP per capita	-0.000	0.000	0.003	0.013**
	(0.008)	(0.006)	(0.011)	(0.006)
# Observations	***3,459***	***3,459***	***3,459***	***3,459***

Notes: The dependent variable is a 0-1 variable indicating if there is an episode (either surge, stop, flight or retrenchment). Variables are defined in Section 4.1. Estimates are obtained using the complementary logarithmic (or cloglog) framework which assumes that $F(\cdot)$ is the cumulative distribution function (cdf) of the extreme value distribution. To capture the covariance across episodes, the set of four episodes is estimated using seemingly unrelated estimation with robust standard errors clustered by country. ** is significant at the 5% level and * at the 10% level.

Table 5a
Correlations between Risk Measures

	VXO	VIX	Quality Spread	CSFB RAI
VXO	1.000			
VIX	0.992	1.000		
Quality Spread	0.695	0.731	1.000	
CSFB Risk Appetite Index (RAI)	0.550	0.535	0.358	1.000
Variance Risk Premium (VRP)	0.692	0.712	0.443	0.428

Table 5b
Correlations between Capital Control Measures

	Capital controls	Fin Integ.	Overall Restrict.	Purch locally	Sales locally	Purch abroad	Sales abroad	Fin controls
Capital controls Chinn-Ito (2008), updated 2011	1.000							
Financial integration Lane-Milesi-Ferretti (2007)	-0.330	1.000						
Overall capital act restrictions Schindler (2009)	0.690	-0.257	1.000					
Restrictions on purchases locally by nonresidents, Schindler (2009)	0.284	-0.205	0.594	1.000				
Restrictions on sale or issue locally by nonresidents , Schindler (2009)	0.512	-0.210	0.624	0.332	1.000			
Restrictions on purchases abroad by residents, Schindler (2009)	0.498	-0.159	0.782	0.328	0.375	1.000		
Restrictions on sale or issue abroad by residents , Schindler (2009)	0.503	-0.198	0.758	0.482	0.558	0.579	1.000	
Financial controls Ostry et al. (2011)	0.486	-0.409	0.636	0.471	0.365	0.475	0.411	1.000
Forex regulations Ostry et al. (2011)	0.542	-0.459	0.602	0.457	0.426	0.381	0.275	0.618

Table 6a
Coefficient on Global Risk Measure with Alternate Measures of Risk

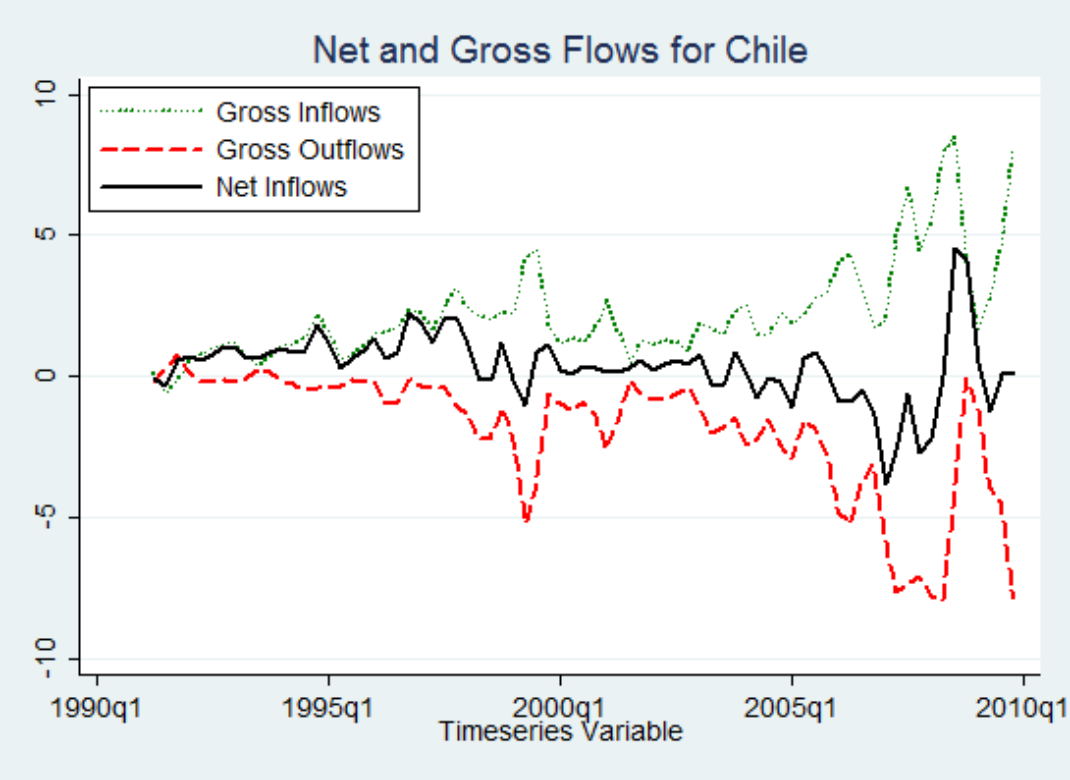
Risk Variable Measured by:	Surge	Stop	Flight	Retrench	# Obs
VXO	-0.036**	0.023**	-0.033*	0.015**	3,459
	(0.016)	(0.005)	(0.020)	(0.006)	
VIX	-0.046*	0.030**	-0.035	0.015**	3,287
	(0.023)	(0.006)	(0.028)	(0.006)	
Quality Spread	-0.701**	0.580**	-0.411	0.423**	3,491
	(0.347)	(0.136)	(0.332)	(0.139)	
CSFB Risk Appetite Index	-0.044	0.106**	-0.024	0.102**	3,491
(RAI)	(0.032)	(0.023)	(0.039)	(0.023)	
Volatility Risk Premium	-0.011	0.010**	-0.011	0.001	3,287
(VRP)	(0.010)	(0.002)	(0.010)	(0.003)	

Table 6b
Coefficient on Capital Control Variable with Alternate Measures of Capital Controls

Capital Control Variable Measured by:	Surge	Stop	Flight	Retrench	# Obs
Capital controls	0.024	-0.029	-0.130*	-0.034	3,459
Chinn-Ito (2008)	(0.069)	(0.057)	(0.071)	(0.061)	
Financial integration	-0.031	-0.186**	-0.216	-0.115*	3,459
Lane-Milesi-Ferretti (2007)	(0.135)	(0.072)	(0.156)	(0.061)	
Overall capital act restrictions	0.028	-0.061	0.698	0.467	1,763
Schindler (2009)	(0.460)	(0.431)	(0.457)	(0.398)	
Specific capital act restrictions	-0.440	0.124	0.297	0.556*	1,763
Schindler (2009)	(0.325)	(0.239)	(0.297)	(0.288)	
Financial controls	-0.414	-0.244	-0.379	0.605	1,183
Ostry et al. (2011)	(0.438)	(0.447)	(0.467)	(0.476)	
Forex regulations	-0.910	0.013	0.085	0.225	1,213
Ostry et al. (2011)	(0.646)	(0.508)	(0.561)	(0.481)	

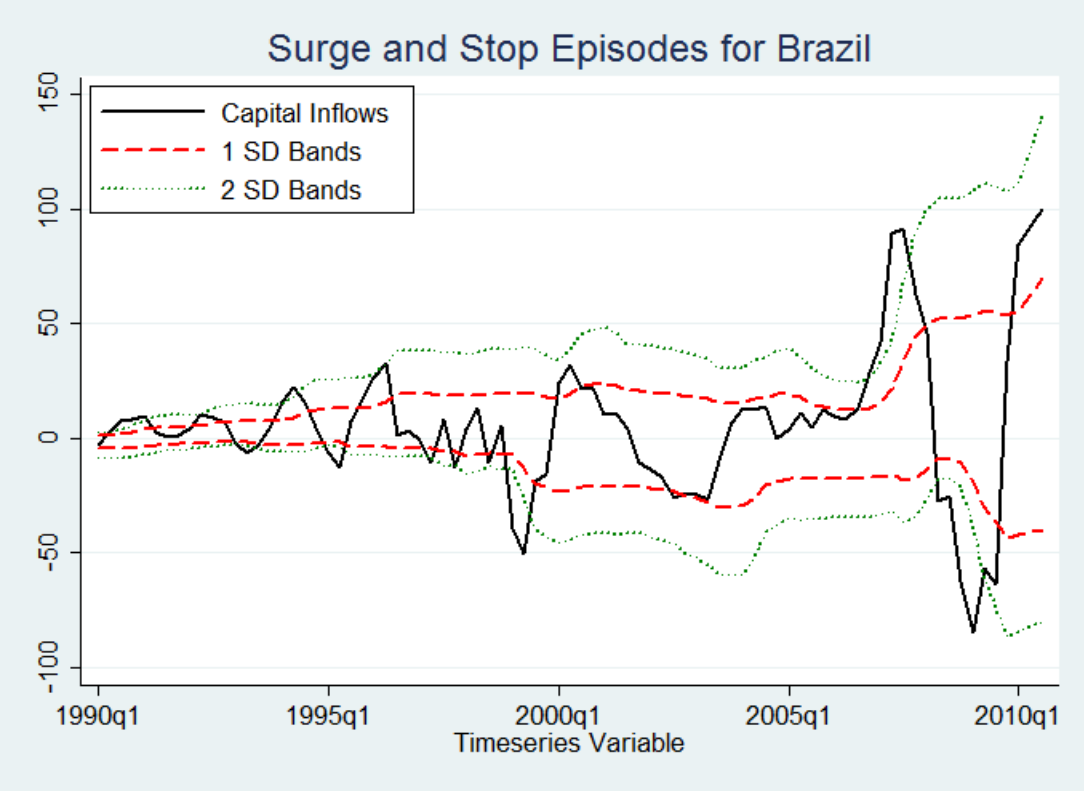
Notes: Tables above report the coefficients on either the *Global Risk* or *Capital Control* variables when the base regressions reported in Table 4 are estimated except the corresponding variable is replaced with one of the alternative measures listed in the table. See Table 4 for additional information on estimation technique and additional variables included in the regressions. ** is significant at the 5% level and * at the 10% level.

Figure 1
Net and Gross Capital Flows for Chile



Notes: This graph shows net capital flows and gross inflows and gross outflows for Chile from 1990 to 2010. Each flow is calculated as the 2-quarter moving average. Gross outflows are reported using standard BOP definitions, so that a negative number indicates a gross outflow.

Figure 2
Construction of the Surge and Stop Episodes



Notes: The figure shows the construction of our measures of surges and stops for Brazil. A surge episode begins when gross inflows (the black solid line) exceed one standard deviation above the rolling mean, provided they eventually exceed two standard deviations above the mean. The surge episode ends when gross inflows again cross the one standard deviation line. Stops are defined analogously; a stop episode begins when gross inflows fall one standard deviation below the rolling mean, provided they eventually fall two standard deviations below the mean, and ends when gross inflows again cross the one standard deviation line. Flight and retrenchment episodes, not shown, are constructed analogously but with gross outflows rather than gross inflows.

Figure 3
Percent of Countries with Each Type of Episode: By Income Level

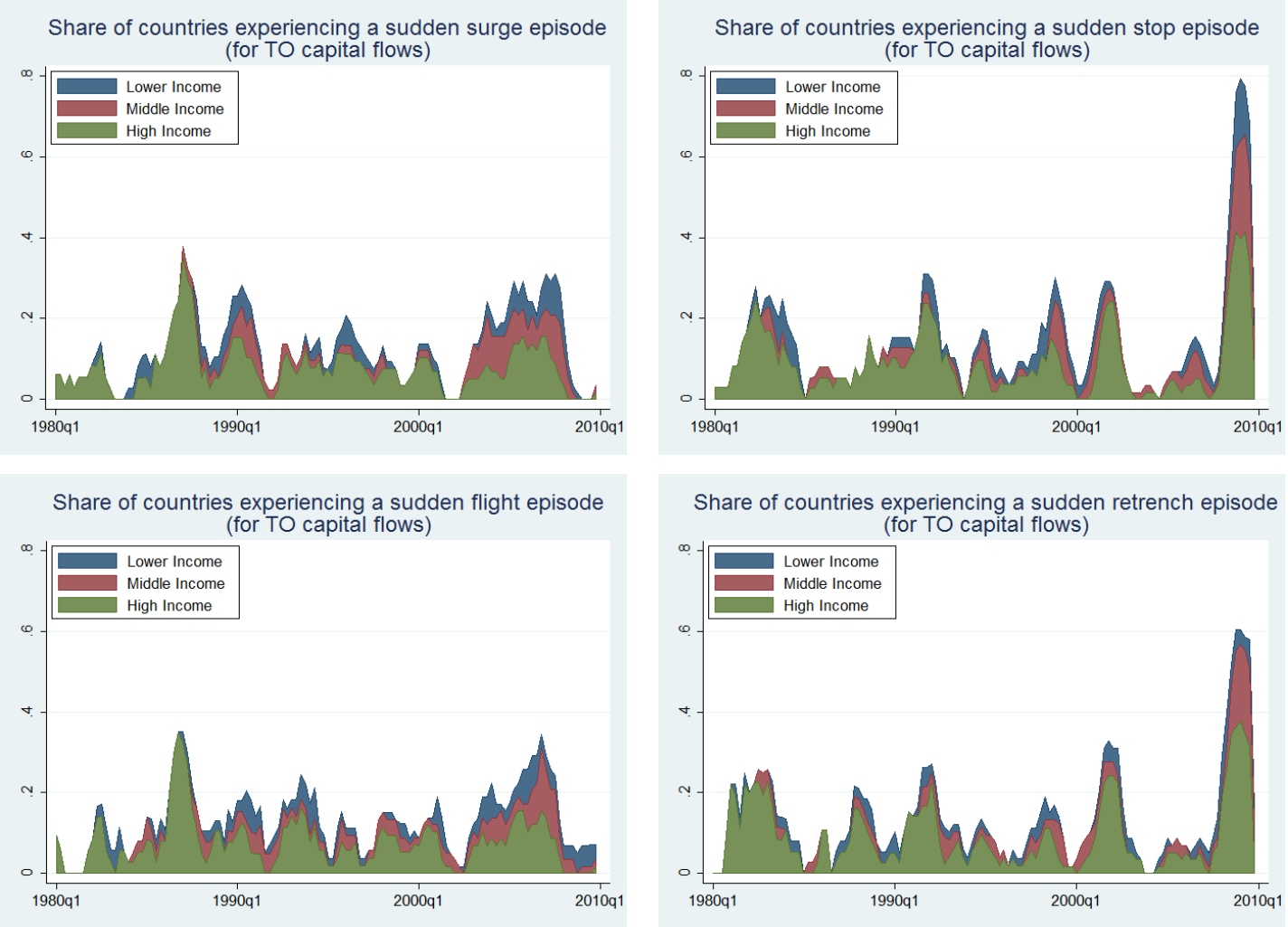
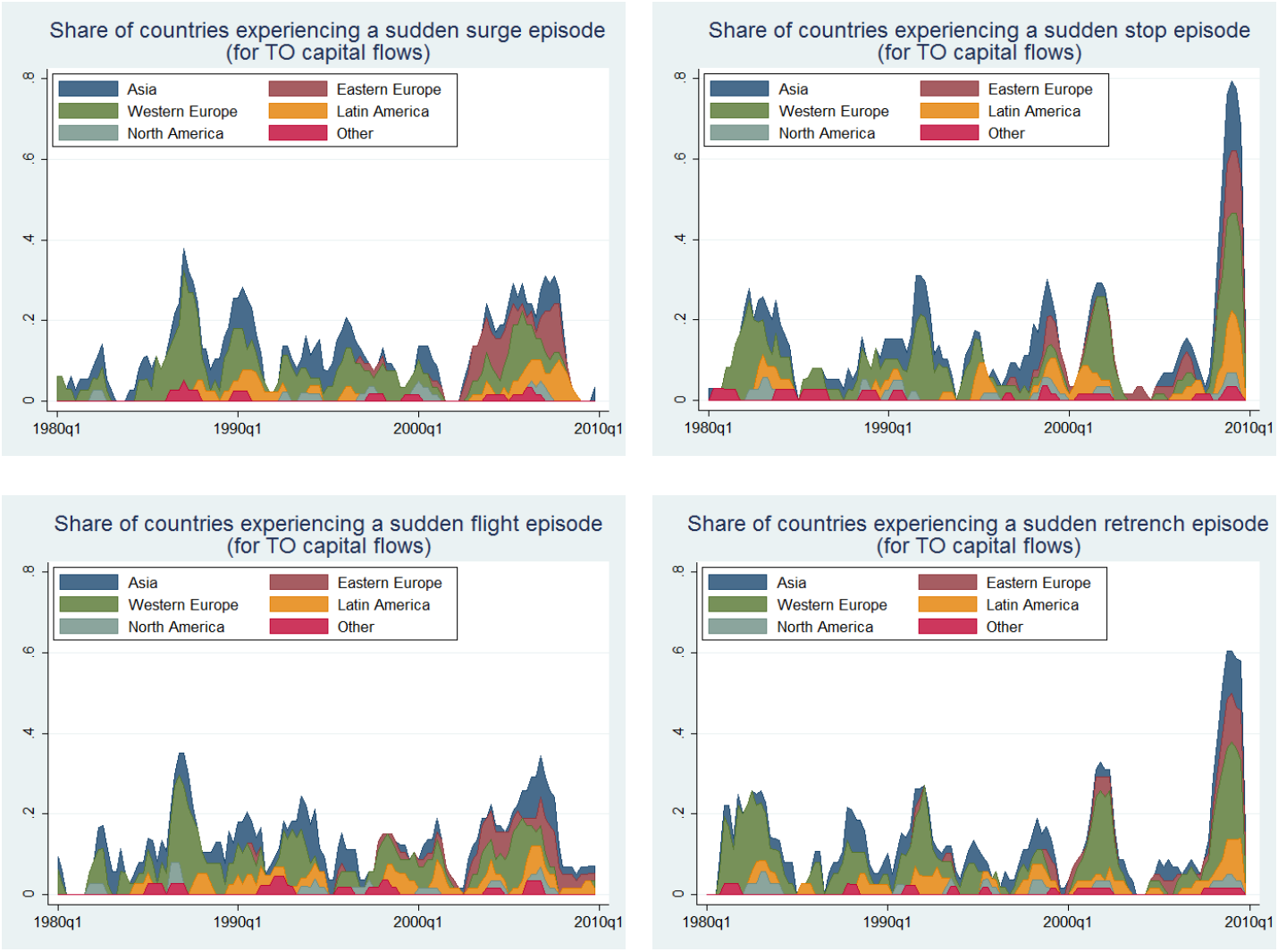


Figure 4
Percent of Countries with Each Type of Episode: By Region



Appendix Table 1: Country and Time Period Representation

The table shows the 58 countries in our sample, as well as the dates for which quarterly gross capital flows data are available. All data series end in 2009 and are from the IFS unless noted.

Country	Start year	Country	Start year
Argentina	1980	Latvia	1993
Australia	1980	Lithuania	1993
Austria	1980	Malaysia	1999
Bangladesh[+]	1980	Mexico+	1980
BelLux	1980	Netherlands	1980
Bolivia[*]	1988	New Zealand	1980
Brazil	1980	Nicaragua	1992
Canada	1980	Norway[*]	1980
Chile	1991	Panama	1998
Colombia	1996	Peru[*]	1980
Croatia	1993	Philippines	1980
Czech Republic	1993	Poland[*]	1985
Denmark	1981	Portugal	1980
Estonia	1992	Romania	1991
Finland	1980	Russia	1994
France	1980	Singapore[++]	1995
Germany	1980	Slovak Rep.[++]	1993
Greece[*]	1980	Slovenia[*]	1992
Guatemala[+]	1980	South Africa	1980
Hong Kong	1999	Spain	1980
Hungary	1989	Sri Lanka	1980
Iceland	1980	Sweden	1980
India[*]	1980	Switzerland	1999
Indonesia[+]	1981	Taiwan[++]	1981
Ireland	1981	Thailand[+]	1980
Israel	1980	Turkey	1984
Italy	1980	UK	1980
Japan	1980	US	1980
Korea	1980	Venezuela	1994

[*] There are gaps in both inflows and outflows for Norway (92q1-93q4), Greece (98q1-98q4), Bolivia (85q1-87q4), and Peru (85q1-90q4). There are gaps in outflows only for India (91q1-99q4). There are gaps in inflows only for Slovenia (94q4-96q1).

[+] Gaps in outflows are filled in with zeros for Guatemala (95q1-00q4), Mexico (94q1-95q4), Bangladesh (01q3-01q4), Indonesia (952-954, 033-034), and Thailand (921-924).

[++]Data from non-IFS sources: Slovak Rep. (01q1-01q4) http://www.nbs.sk/en/statistics/balance-of-payments-statistics/en-platobna-bilancia; Singapore BOP dataset; and Taiwan http://www.cbc.gov.tw/ct.asp?xItem=2070&ctNode=512&mp=2 .

Appendix Table 2: Surge, Stop, Flight and Retrenchment Episodes by Country (1980 to 2009)

	Surges		Stops		Flight		Retrenchment	
	Start	End	Start	End	Start	End	Start	End
Argentina	1990q4	1992q3	1982q4	1983q1	1989q3	1990q1	1982q3	1982q4
	2003q1	2003q4	1989q2	1990q3	1991q2	1992q3	1988q3	1989q1
			1994q4	1995q1	2002q4	2003q1	1992q4	1993q2
			1998q4	1999q3	2006q3	2007q3	1998q3	1999q2
			2000q4	2002q2	2008q1	2008q3	2009q2	2009q4
			2008q2	2009q3				
Australia	1980q4	1983q1	1983q2	1984q1	1980q1	1980q2	1980q4	1981q2
	1993q4	1994q3	1989q3	1991q3	1984q2	1985q1	1989q2	1991q1
	1995q3	1996q3	1997q3	1998q1	1995q4	1996q3	1994q4	1995q2
	2002q3	2002q4	1998q3	1998q4	2004q1	2004q3	2003q1	2003q3
	2003q4	2004q3	2005q1	2005q4	2006q2	2007q1	2005q1	2005q4
	2006q2	2007q1						
Austria	1980q3	1980q4	1981q3	1982q3	1992q2	1993q1	1981q4	1982q3
	1992q2	1993q1	1996q4	1997q1	1997q2	1998q1	1986q1	1986q2
	1999q2	2000q1	2001q1	2002q1	1999q2	2000q1	1993q3	1993q4
	2005q1	2005q4	2006q1	2006q4	2005q1	2005q4	1998q2	1998q3
			2008q3	2009q3			2001q2	2002q1
							2006q1	2006q4
							2008q4	2009q4
Bangladesh	1989q1	1989q4	1982q4	1983q3	1987q1	1987q3	1992q2	1993q1
	1998q1	1998q3	1991q3	1992q1	1988q2	1989q3	2001q1	2001q4
	2003q4	2004q1	2006q1	2006q2	1995q3	1997q1	2009q3	2009q4
	2005q1	2005q2			2005q4	2006q3		
					2008q2	2008q4		
Belgium - Luxembourg	1987q1	1987q4	1981q1	1982q2	1987q1	1987q4	1981q1	1982q2
	1999q3	2000q3	1988q2	1989q1	1999q3	2000q3	1988q2	1989q1
			1994q1	1995q1	2005q2	2006q1	1994q1	1995q1
			2001q4	2002q3			2001q4	2002q3
			2008q2	2009q3			2008q2	2009q3
Bolivia	1996q1	1996q3	1995q1	1995q2	1994q1	1994q4	2004q3	2005q1
	2007q3	2008q4	1999q2	2001q2	2001q1	2001q2	2006q2	2006q3
			2006q3	2007q2	2003q3	2004q1		
					2008q4	2009q3		
Brazil	1988q1	1988q4	1982q4	1983q4	1984q2	1985q1	1982q4	1983q4
	1990q2	1991q1	1993q1	1993q3	1987q4	1988q3	1985q2	1985q4
	1994q1	1994q3	1995q1	1995q2	1994q2	1994q4	1992q1	1992q4
	1995q4	1996q2	1999q1	1999q2	1998q3	1999q2	1995q2	1996q1
	2006q3	2007q4	2008q2	2009q3	2006q4	2007q3	1997q4	1998q2
							2008q2	2008q3

	Surges		Stops		Flight		Retrenchment	
	Start	**End**	**Start**	**End**	**Start**	**End**	**Start**	**End**
Canada	1996q4	1997q3	1982q2	1983q2	1986q2	1986q4	1982q2	1983q2
	2000q1	2001q1	1991q2	1991q3	1994q2	1994q4	1993q2	1993q3
	2006q2	2007q1	1995q2	1996q1	1996q3	1997q2	1995q2	1996q1
			1999q1	1999q4	2000q1	2001q1	1998q1	1998q3
			2008q4	2009q2	2006q2	2007q1	2008q4	2009q3
Chile	2005q4	2006q3	2000q2	2001q1	1998q2	1999q4	1997q2	1997q3
	2007q4	2008q3	2007q1	2007q2	2006q1	2006q4	2000q2	2000q4
			2009q1	2009q3			2008q3	2009q3
Colombia	2005q4	2006q3	2008q2	2009q1	2006q2	2006q3	2002q2	2003q1
							2007q2	2007q3
Croatia	2002q4	2004q1	1998q4	1999q2	2000q1	2000q4	2001q3	2002q1
			2004q4	2005q3	2002q4	2003q4	2004q4	2005q4
					2006q4	2007q3		
Czech Republic	2002q3	2003q1	2003q2	2004q1	2003q3	2005q1	2000q1	2000q4
			2006q2	2006q4			2002q1	2002q3
			2008q4	2009q3			2008q4	2009q4
Denmark	1993q3	1994q2	1986q4	1987q2	1993q3	1994q2	1986q4	1987q2
	1995q3	1996q2	1989q2	1989q4	1999q4	2001q1	1992q2	1993q2
	2005q1	2005q4	1991q4	1993q2	2005q2	2005q4	1994q3	1995q1
			1994q3	1995q1			2001q2	2002q2
			1998q3	1999q1			2008q3	2009q4
			2001q2	2002q1				
			2008q4	2009q4				
Estonia	1997q4	1998q1	1998q3	1999q3	1997q4	1998q1	1998q4	1999q1
	2003q1	2005q1	2008q2	2009q4	2001q1	2001q2	2000q1	2000q2
					2004q2	2005q3	2008q2	2009q3
Finland	1984q3	1985q1	1985q4	1986q2	1985q1	1985q2	1983q3	1984q2
	1987q1	1987q4	1991q1	1992q2	1986q3	1987q1	1985q4	1986q2
	1996q3	1997q3	2001q1	2001q4	1988q3	1989q1	1987q3	1987q4
	1998q4	1999q1	2009q2	2009q3	1993q1	1993q3	1990q3	1990q4
	2004q3	2004q4			1998q4	1999q1	1992q1	1992q3
	2006q2	2007q1			2004q3	2005q1	2001q1	2001q4
					2006q2	2006q4	2009q1	2009q3
France	1986q3	1987q4	1981q3	1982q2	1986q4	1987q4	1981q1	1983q2
	1997q4	1998q3	1991q1	1992q1	1992q3	1992q4	1991q2	1992q1
	2001q1	2001q2	2001q4	2002q3	1997q4	1998q3	2001q4	2002q3
			2008q1	2009q3	2001q1	2001q2	2008q1	2009q3

	Surges		Stops		Flight		Retrenchment	
	Start	**End**	**Start**	**End**	**Start**	**End**	**Start**	**End**
Germany	1980q1	1980q2	1981q4	1982q4	1984q3	1985q2	1981q4	1982q1
	1986q1	1986q4	1987q4	1988q3	1985q4	1986q4	1982q3	1983q2
	1989q2	1990q1	1994q1	1994q4	1993q1	1993q4	1987q3	1988q2
	1992q3	1993q2	2001q1	2002q2	2004q3	2005q4	1990q4	1992q2
	2005q1	2005q4	2008q3	2009q3			1994q2	1994q4
	2007q2	2008q1					2000q4	2002q2
							2008q3	2009q3
Greece	1989q4	1991q1	1981q4	1982q3	2001q3	2001q4	1997q2	1997q4
	1995q1	1995q2	1992q1	1992q4	2005q1	2005q3	2006q1	2006q4
	1996q4	1997q2	1995q4	1996q2				
	2005q1	2005q4	1997q3	1997q4				
			2006q1	2006q4				
			2009q2	2009q4				
Guatemala	1987q4	1988q1	1994q4	1995q3	1990q3	1991q2	1988q3	1988q4
	2006q1	2006q4	2008q4	2009q3	1998q2	1998q3	1989q2	1990q1
					1999q1	1999q4	1991q3	1992q1
					2001q1	2001q3	2002q2	2002q3
					2004q1	2004q4	2008q4	2009q3
Hong Kong			2008q3	2009q3			2008q3	2009q3
Hungary	2003q1	2003q4	1996q4	1997q1	1995q3	1995q4	2008q4	2009q1
	2004q2	2005q3	2002q2	2002q3	2001q2	2002q1	2009q3	2009q4
	2007q2	2008q1	2009q1	2009q4	2006q1	2008q1		
Iceland	1995q4	1996q4	1989q2	1990q1	1986q3	1987q2	1992q1	1992q3
	2003q3	2006q1	2001q2	2002q1	1993q2	1993q3	2001q3	2002q2
			2008q2	2009q3	1997q3	1998q2	2006q4	2007q1
					1999q1	1999q4	2008q1	2009q2
					2003q1	2006q1		
	1982q2	1982q3	1989q4	1990q4	1982q2	1982q4	1981q2	1981q4
India	1984q1	1985q2	1991q3	1992q1	1990q3	1990q4	1983q2	1984q1
	1993q4	1994q4	2008q3	2009q3	2005q4	2006q4	2007q4	2008q2
	2006q4	2008q1						
	1990q3	1991q2	1993q2	1993q3	1993q3	1994q3	1997q4	1998q2
Indonesia	1995q2	1996q3	1997q4	1998q3	2002q3	2003q2	2006q3	2007q1
	2005q4	2006q1	2006q4	2007q1	2005q4	2006q2		
	1980q1	1980q2	1981q4	1982q4	1984q3	1985q2	1981q4	1982q1

	Surges		Stops		Flight		Retrenchment	
	Start	**End**	**Start**	**End**	**Start**	**End**	**Start**	**End**
Ireland	1986q4	1987q3	1991q3	1992q2	1987q2	1988q1	1991q4	1992q2
	1989q3	1990q2	2001q2	2001q3	1989q3	1990q1	2000q4	2001q3
	1992q4	1993q4	2008q2	2009q3	1992q3	1993q1	2008q2	2009q3
	1995q3	1996q3			1995q4	1996q3		
	1997q4	1999q1			1997q4	1998q4		
	2003q3	2004q2			2003q3	2004q2		
	2006q3	2007q3			2006q4	2007q3		
Israel	1986q2	1987q1	1980q2	1981q3	1986q2	1987q1	1981q1	1981q4
	1989q4	1990q3	1983q4	1984q4	1992q1	1992q3	1991q1	1991q3
	1999q2	2000q1	1988q3	1989q2	1998q1	1998q4	1993q3	1993q4
	2006q1	2006q4	1996q3	1996q4	2006q1	2006q4	1995q2	1995q3
			1998q3	1998q4			2001q2	2002q2
			2001q2	2002q2			2007q3	2009q3
			2007q3	2007q4				
			2008q4	2009q2				
Italy	1987q1	1987q3	1982q2	1983q1	1987q1	1987q3	1982q2	1983q1
	1996q1	1997q1	1991q4	1992q2	2003q1	2003q4	1986q1	1986q2
	2003q1	2003q4	1992q4	1993q3	2005q1	2005q4	1993q1	1993q3
	2005q2	2006q1	1999q1	1999q2			2000q3	2002q3
			2000q4	2002q3			2007q3	2009q1
			2008q2	2009q1				
Japan	1986q2	1987q3	1982q4	1983q1	1986q1	1987q2	1982q4	1983q1
	1993q4	1995q1	1990q4	1991q4	1993q4	1994q4	1987q4	1988q3
	2000q2	2001q1	1992q2	1993q1	2000q2	2001q1	1990q3	1991q3
			1998q1	1999q1			1996q3	1996q4
			2005q2	2005q3			1998q2	1999q4
			2006q3	2007q1			2008q3	2009q3
			2008q3	2009q3				
Korea	1988q2	1989q1	1986q3	1987q4	1982q2	1983q1	1984q3	1984q4
	1990q2	1991q2	1997q2	1998q3	1985q2	1985q4	1987q4	1988q1
	1994q3	1995q4	2008q1	2009q2	1988q4	1989q1	1997q3	1999q1
	2009q4	2009q4			1990q2	1990q3	2005q1	2005q3
					1994q2	1995q4	2008q3	2009q3
					2002q4	2003q3		
Latvia	2003q3	2005q1	1998q4	1999q2	2006q3	2007q4	1998q4	1999q2
	2006q2	2007q4	2005q3	2005q4			2005q3	2006q1
			2008q3	2009q3			2008q3	2009q2
Lithuania	2004q2	2004q3	2000q4	2001q2	2004q1	2004q4	2001q2	2001q3
	2005q4	2006q2	2008q3	2009q4			2008q3	2009q3
	2006q4	2007q4						

	Surges		Stops		Flight		Retrenchment	
	Start	**End**	**Start**	**End**	**Start**	**End**	**Start**	**End**
Malaysia	2009q4		2005q4	2006q3	2006q2	2007q4	2008q3	2009q2
			2008q3	2009q2				
Mexico	1989q2	1991q2	1994q4	1995q4	1987q3	1988q2	1991q3	1991q4
	2004q4	2005q3	2008q4	2009q3	1990q1	1990q4	1992q2	1993q1
	2007q3	2008q2			1993q2	1994q1	1997q3	1997q4
					2001q3	2002q2	2008q4	2009q3
Netherlands	1985q3	1987q1	1981q1	1982q3	1980q1		1980q4	1981q1
	1995q3	1996q2	1990q4	1991q4	1986q2	1987q1	1981q4	1983q2
	1997q4	1998q4	2001q2	2001q3	1997q4	1998q4	1990q4	1992q1
	2005q2	2006q2	2002q1	2002q4	2005q2	2006q2	2001q2	2001q3
			2008q1	2009q3			2002q1	2002q4
							2008q1	2009q3
New Zealand	1986q3	1987q2	1987q4	1988q3	1986q4	1987q2	1986q1	1986q2
	2000q2	2001q1	1996q4	1997q2	1989q2	1990q2	1988q1	1989q1
	2006q3	2007q3	1998q3	1999q2	1993q3	1994q2	2002q4	2003q3
			2008q2	2009q3	2000q2	2001q1	2005q3	2006q1
					2006q3	2007q3		
Nicaragua			2000q3	2001q3	2000q4	2001q2	1998q1	1998q4
			2009q1	2009q4			2002q4	2003q2
Norway	1982q3	1982q4	1988q3	1989q2	1986q3	1987q3	1981q1	1981q2
	1984q3	1985q3	1991q3	1991q4	2000q2	2001q2	1987q4	1988q4
	2002q4	2003q2	2001q3	2002q1	2005q4	2007q1	2001q4	2002q3
	2005q4	2007q1	2007q4	2008q4			2007q4	2008q3
			2009q2	2009q4			2009q2	2009q4
Panama			2008q4	2009q3			2008q4	2009q3
Peru	2006q4	2008q2	1983q3	1984q3	2001q1	2001q2	2007q1	2007q2
			1998q1	1998q2	2003q2	2004q1	2007q4	2008q3
			1998q4	1999q3	2005q4	2006q3		
			2005q4	2006q1	2009q2	2009q4		
			2008q4	2009q3				
Philippines	1984q4	1985q2	1983q2	1984q2	1991q4	1994q2	1997q3	1998q2
	1994q2	1994q3	1992q1	1992q2	1999q1	1999q2	2008q1	2008q4
	1996q1	1997q1	1997q3	1998q4	2007q1	2007q2		
	2005q2	2005q4	2008q1	2009q1				
	2007q1	2007q3						
Poland	2007q1	2008q2	2008q4	2009q3	1990q4	1991q1	1991q3	1991q4
							1993q2	1993q3
							2008q3	2009q3

	Surges		Stops		Flight		Retrenchment	
	Start	**End**	**Start**	**End**	**Start**	**End**	**Start**	**End**
Portugal	1981q2	1982q3	1983q4	1984q3	1982q2	1982q3	1980q4	1982q1
	1987q3	1988q2	1992q3	1993q2	1983q3	1984q1	1987q4	1988q1
	1988q4	1990q2	1996q2	1996q3	1990q2	1991q2	1989q4	1990q1
	1994q3	1995q3	1999q3	1999q4	1993q1	1993q4	1992q1	1992q2
	2000q1	2000q4	2002q4	2003q1	2003q3	2004q1	1996q1	1996q3
	2003q4	2004q2	2004q4	2005q2	2009q4		2002q4	2003q1
	2006q1	2006q2	2008q3	2009q3			2004q3	2005q2
Romania	1996q4	1997q3	1999q4	2000q1	2003q4	2004q1	2007q4	2008q2
	2000q4	2001q2	2008q3	2009q4	2004q4	2005q3		
	2004q1	2005q3			2006q4	2007q2		
	2006q4	2007q4						
Russia	2003q2	2004q1	2006q2	2006q3	2003q2	2004q2	2001q3	2002q2
	2007q1	2008q1	2008q4	2009q3	2007q2	2009q1	2009q3	2009q4
Singapore	2006q4	2008q1	2008q2	2009q3	2006q2	2007q4	2008q2	2009q3
Slovak Republic	2004q3	2005q2	1998q4	1999q4	2008q2	2008q3	1999q1	1999q2
			2006q1	2006q4	2009q1	2009q4	2007q2	2007q3
Slovenia	2002q3	2003q3	1998q1	1998q2	1998q3	1999q2	2008q1	2009q3
	2007q1	2007q4	2003q4	2004q2	2002q4	2003q3		
			2008q3	2009q3	2007q1	2007q4		
South Africa	1987q1	1987q4	1985q2	1986q3	1985q1	1985q4	1987q4	1988q2
	1997q2	1998q1	1990q2	1990q4	1991q2	1993q1	1999q1	1999q2
	2003q4	2004q4	1998q3	1999q2	1995q3	1996q2	2000q3	2001q1
	2005q2	2006q2	2000q3	2001q1	1997q2	1998q2		
			2007q1	2007q2	2003q4	2004q3		
			2008q3	2009q3	2006q1	2006q4		
Spain	1987q1	1988q2	1982q1	1983q2	1982q1	1982q4	1981q1	1981q2
	1990q4	1991q3	1985q2	1986q2	1988q2	1989q1	1983q2	1984q1
			1992q1	1992q2	1990q1	1991q2	1987q1	1987q3
			1994q2	1995q1	1992q3	1993q4	1991q4	1992q1
			2001q3	2002q2			1994q2	1995q1
			2008q1	2009q4			2001q3	2002q2
							2007q3	2009q3
Sri Lanka	1989q4	1990q3	1983q4	1984q4	1982q4	1983q3	1990q1	1990q2
	2000q1	2000q4	1994q2	1994q3	1990q3	1991q2	1993q2	1994q3
			1995q4	1996q1	1995q1	1995q3	1998q4	1999q1
			1998q3	1999q1	2007q3	2008q1	2001q4	2002q3
			2001q2	2002q1	2009q1	2009q3		
			2008q1	2008q2				

	Surges		Stops		Flight		Retrenchment	
	Start	**End**	**Start**	**End**	**Start**	**End**	**Start**	**End**
Sweden	1985q3	1987q3	1983q4	1984q3	1981q4	1982q3	1984q1	1984q4
	1989q2	1990q4	1991q2	1992q2	1986q2	1988q1	1991q1	1992q1
	1998q1	1998q4	1997q1	1997q3	1988q4	1990q3	1997q1	1997q3
	2004q4	2005q2	2001q4	2002q4	1995q3	1996q3	2000q2	2000q3
			2008q4	2009q3			2001q1	2002q3
							2008q1	2009q3
Switzerland	2005q3	2006q2	2008q1	2009q1	2005q3	2006q1	2008q1	2009q1
Taiwan	1999q2	2000q2	1997q4	1998q3	1996q1	1996q3	1991q4	1992q1
	2003q3	2004q2	2001q1	2001q2	2000q1	2000q4	1997q1	1997q4
	2009q4		2005q1	2005q2	2003q3	2004q1	2002q2	2002q3
			2008q4	2009q2			2008q2	2009q2
Thailand	1987q4	1990q3	1982q1	1982q2	1983q2	1983q3	1984q2	1984q4
	1995q2	1996q1	1992q1	1992q4	1985q2	1986q1	1986q4	1988q4
	2004q3	2006q1	1996q3	1998q2	1989q3	1990q2	1991q2	1991q4
			2007q1	2007q4	1993q2	1994q2	1994q4	1995q1
			2008q3	2009q3	2005q1	2006q1	1996q3	1997q2
					2009q4		2008q1	2009q3
Turkey	1990q1	1990q4	1991q3	1991q4	1991q1	1991q2	1994q3	1995q3
	1992q3	1993q4	1994q2	1995q1	1995q4	1996q3	2007q4	2008q2
	2000q1	2000q3	2001q1	2001q4	2006q4	2007q3	2009q2	2009q4
			2007q4	2008q2				
			2008q4	1980q1				
UK	1980q1	1980q2	1990q1	1990q3	1980q1	1980q2	1982q2	1983q1
	1985q3	1987q2	1991q3	1992q1	1985q4	1987q2	1991q3	1992q2
	1992q3	1993q4	1994q2	1994q4	1992q4	1993q2	1998q1	1998q4
			1998q1	1998q4	2000q3	2000q4	2001q3	2002q2
			2001q3	2002q2			2008q2	2009q2
			2008q2	2009q2				
US	1982q1	1982q3	1983q1	1983q3	1981q4	1982q3	1983q1	1984q1
	1992q3	1992q4	1988q3	1988q4	1986q2	1986q4	1990q3	1990q4
	1993q3	1994q3	1989q4	1990q4	1993q3	1994q2	1998q1	1998q4
	1999q4	2000q3	1998q1	1999q1	2004q1	2004q4	2001q3	2002q2
	2006q4	2007q2	2001q3	2002q2	2006q4	2007q3	2008q1	2009q1
			2008q1	2009q2				
Venezuela	2003q4	2004q1	2006q2	2006q4	2005q2	2006q2	2001q1	2001q4
	2005q2	2005q4					2006q4	2007q1
	2007q2	2008q1					2008q4	2009q3

Appendix Table 3a: Sensitivity Tests—Explaining Surge Episodes

Global Factors	Drop Crisis[1]	Fixed Effects	Add ER Regime[2]	Add Moodys[2]	Add TOT[2]	Global Credit[3]	Financial System[3]	Growth Shock[4]	Inc. Official Flows[5]	HP Filter[5]
Global risk	-0.035**	-0.036*	-0.035**	-0.048**	-0.037**	-0.038**	-0.041**	-0.036*	-0.036**	-0.004
	(0.016)	(0.021)	(0.017)	(0.021)	(0.016)	(0.018)	(0.020)	(0.020)	(0.015)	(0.008)
Global liquidity	1.603	1.281	1.212	2.993*	0.520	-0.405*	1.396	2.370	1.251	0.351
	(1.132)	(1.174)	(1.061)	(1.573)	(1.072)	(0.241)	(1.500)	(1.568)	(1.001)	(1.102)
Global interest rates	0.015	0.062	0.018	-0.003	0.040	0.037	0.011	0.028	0.022	-0.040
	(0.052)	(0.080)	(0.052)	(0.075)	(0.055)	(0.058)	(0.060)	(0.064)	(0.051)	(0.059)
Global growth	23.539**	25.200**	25.848**	20.555*	28.938**	23.088**	15.319	16.886*	26.174**	27.631**
	(9.797)	(11.283)	(10.166)	(11.889)	(10.811)	(10.214)	(9.682)	(9.573)	(9.649)	(10.745)
Contagion Factors										
Regional	0.403	0.635*	0.481*	0.391	0.411*	0.508*	0.502	0.464	0.451	0.534*
	(0.257)	(0.348)	(0.270)	(0.334)	(0.222)	(0.270)	(0.316)	(0.300)	(0.282)	(0.317)
Trade	4.967	4.820	4.727	5.004	3.128	4.860	5.558	5.395	5.039	9.605
	(4.165)	(5.275)	(4.436)	(4.886)	(4.169)	(4.406)	(4.653)	(4.926)	(4.606)	(6.893)
Financial	-1.699	-1.218	-0.962	-0.703	-0.362	-1.091	-0.468	-0.727	-1.438	1.356
	(1.420)	(2.546)	(1.597)	(1.901)	(1.733)	(1.574)	(1.929)	(1.951)	(1.827)	(2.571)
Domestic Factors										
Financial system	0.005	0.274	-0.058	-0.117	0.037	0.188	1.669	-0.009	-0.016	0.133
	(0.206)	(0.443)	(0.208)	(0.239)	(0.210)	(0.224)	(1.077)	(0.218)	(0.208)	(0.360)
Capital controls	-0.024	-0.083	-0.042	0.017	0.010	-0.019	-0.055	-0.022	-0.024	0.235**
	(0.069)	(0.112)	(0.069)	(0.078)	(0.076)	(0.071)	(0.085)	(0.079)	(0.067)	(0.087)
Debt to GDP	-0.006**	-0.008	-0.006**	-0.005	-0.002	-0.007**	-0.004	-0.005	-0.006**	0.001
	(0.003)	(0.006)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Growth shock	1.583**	0.742	1.475**	1.794**	0.969	1.477**	1.413**	16.830**	1.413**	0.063
	(0.694)	(0.565)	(0.649)	(0.702)	(0.770)	(0.630)	(0.641)	(7.332)	(0.640)	(1.128)
GDP per capita	0.001	-0.007	0.001	-0.017	0.003	0.005	-0.004	-0.001	-0.000	0.014
	(0.008)	(0.024)	(0.008)	(0.015)	(0.009)	(0.009)	(0.008)	(0.009)	(0.008)	(0.013)
			-0.326**	-0.039	0.020**					
			(0.158)	(0.040)	(0.007)					
Sample Size	***3,255***	***3,459***	***3,459***	***2,908***	***2,954***	***3,330***	***3,304***	***3,287***	***3,459***	***2,290***

Notes: The dependent variable is a 0-1 variable indicating if there is an episode (either surge, stop, flight or retrenchment). Variables are defined in Section 4.1. Estimates are obtained using the complementary logarithmic framework with seemingly unrelated estimation across the four episodes and robust standard errors clustered by country. ** is significant at the 5% level and * at the 10% level. (1) Drops the recent crisis from 2008Q2 through 2009Q2 from the sample. (2) Additional control variables are included in the regression; for ER regime the control is a dummy equal to 1 if the country has a pegged exchange rate as defined in Shambaugh (2004); for Moodys the control is a numerical value for Moody's index, with a higher value indicating lower credit; TOT is the terms of trade as measured by the World Bank's "Net Barter Terms of Trade Index". (3) Global liquidity is measured as the growth in private credit by deposit money banks and other institutions to GDP. Financial system measures the soundness of the financial system as bank return on equity. Both variables are from Beck and Demirguc-Kunt (2009). (4) Growth shock is measured as the deviation between actual growth and forecasted growth, as forecast in the IMF's WEO in the previous spring. (5) Episodes are constructed by either including reserves in order to capture private and official flows instead of just private flows, or by using an HP filter with a 30% boundary.

Appendix Table 3b: Sensitivity Tests—Explaining Stop Episodes

Global Factors	Drop Crisis[1]	Fixed Effects	Add ER Regime[2]	Add Moodys[2]	Add TOT[2]	Global Credit[3]	Financial System[3]	Growth Shock[4]	Inc. Official Flows[5]	HP Filter[5]
Global risk	0.022**	0.022**	0.023**	0.025**	0.023**	0.024**	0.024**	0.023**	0.023**	0.022**
	(0.009)	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Global liquidity	-3.616**	-1.991	-0.963	-1.092	-1.380	0.102	-0.541	-0.927	-0.977	1.671
	(1.224)	(1.270)	(1.124)	(1.129)	(1.182)	(0.256)	(1.231)	(1.064)	(1.097)	(1.127)
Global interest rates	0.103**	0.101**	0.057	0.113**	0.086**	0.066*	0.043	0.059	0.059	0.010
	(0.041)	(0.048)	(0.036)	(0.048)	(0.037)	(0.038)	(0.034)	(0.036)	(0.038)	(0.059)
Global growth	-7.899**	-1.946	-6.823**	-4.877	-6.073*	-7.577**	-6.364**	-6.617**	-6.914**	-6.569**
	(2.994)	(3.617)	(2.863)	(3.500)	(3.117)	(2.869)	(3.169)	(2.795)	(2.991)	(3.237)
Contagion Factors										
Regional	0.338**	0.419**	0.378**	0.373**	0.277*	0.380**	0.446**	0.373**	0.372**	0.808**
	(0.134)	(0.150)	(0.141)	(0.166)	(0.161)	(0.139)	(0.149)	(0.137)	(0.141)	(0.207)
Trade	0.848	5.648*	3.578	5.241**	4.634*	3.028	3.633	3.212	3.688*	5.047
	(2.680)	(3.182)	(2.410)	(2.534)	(2.496)	(2.340)	(2.303)	(2.377)	(1.992)	(3.910)
Financial	3.966**	4.806**	4.311**	3.957**	4.273**	4.269**	4.067**	3.610**	4.193**	2.282**
	(0.915)	(1.089)	(0.907)	(0.911)	(0.917)	(0.928)	(0.807)	(0.840)	(0.902)	(1.163)
Domestic Factors										
Financial system	0.164	0.606*	0.242*	0.354**	0.336**	0.185	-1.055	0.299*	0.262*	-0.006
	(0.152)	(0.352)	(0.145)	(0.151)	(0.171)	(0.152)	(0.928)	(0.159)	(0.150)	(0.311)
Capital controls	0.016	0.017	0.021	0.013	0.060	0.018	0.016	0.038	0.029	0.301**
	(0.056)	(0.119)	(0.061)	(0.067)	(0.062)	(0.064)	(0.049)	(0.051)	(0.059)	(0.104)
Debt to GDP	-0.002	-0.012**	-0.002	-0.000	0.001	-0.002	-0.001	0.001	-0.002	0.010*
	(0.003)	(0.006)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)
Growth shock	-2.681**	-2.859**	-3.256**	-3.440**	-3.775**	-3.160**	-3.474**	-34.554**	-3.253**	-1.411
	(1.139)	(1.043)	(1.068)	(1.042)	(1.349)	(1.030)	(1.010)	(4.914)	(1.050)	(1.119)
GDP per capita	0.002	0.026	0.001	0.012	0.001	-0.003	0.001	0.002	0.000	0.008
	(0.007)	(0.017)	(0.006)	(0.010)	(0.006)	(0.008)	(0.005)	(0.006)	(0.006)	(0.012)
			-0.104	0.046	0.011**					
			(0.148)	(0.029)	(0.005)					
Sample Size	***3,255***	***3,459***	***3,459***	***2,908***	***2,954***	***3,330***	***3,304***	***3,287***	***3,459***	***2,290***

Notes: The dependent variable is a 0-1 variable indicating if there is an episode (either surge, stop, flight or retrenchment). Variables are defined in Section 4.1. Estimates are obtained using the complementary logarithmic framework with seemingly unrelated estimation across the four episodes and robust standard errors clustered by country. ** is significant at the 5% level and * at the 10% level. (1) Drops the recent crisis from 2008Q2 through 2009Q2 from the sample. (2) Additional control variables are included in the regression; for ER regime the control is a dummy equal to 1 if the country has a pegged exchange rate as defined in Shambaugh (2004); for Moodys the control is a numerical value for Moody's index, with a higher value indicating lower credit; TOT is the terms of trade as measured by the World Bank's "Net Barter Terms of Trade Index". (3) Global liquidity is measured as the growth in private credit by deposit money banks and other institutions to GDP. Financial system measures the soundness of the financial system as bank return on equity. Both variables are from Beck and Demirguc-Kunt (2009). (4) Growth shock is measured as the deviation between actual growth and forecasted growth, as forecast in the IMF's WEO in the previous spring. (5) Episodes are constructed by either including reserves in order to capture private and official flows instead of just private flows, or by using an HP filter with a 30% boundary.

Appendix Table 3c: Sensitivity Tests—Explaining Flight Episodes

Global Factors	Drop Crisis[1]	Fixed Effects	Add ER Regime[2]	Add Moodys[2]	Add TOT[2]	Global Credit[3]	Financial System[3]	Growth Shock[4]	Inc. Official Flows[5]	HP Filter[5]
Global risk	-0.037*	-0.036	-0.033	-0.036	-0.036	-0.036*	-0.036	-0.032	-0.041	-0.012
	(0.019)	(0.027)	(0.020)	(0.023)	(0.023)	(0.020)	(0.023)	(0.025)	(0.026)	(0.008)
Global liquidity	-1.108	-1.181	-1.439	-0.476	-3.041**	-0.297	-0.945	-0.428	-1.308	0.629
	(1.322)	(1.430)	(1.218)	(1.504)	(1.387)	(0.229)	(1.641)	(1.542)	(1.541)	(0.911)
Global interest rates	-0.051	-0.041	-0.054	-0.093	-0.037	-0.033	-0.021	-0.030	-0.105	-0.022
	(0.069)	(0.117)	(0.072)	(0.102)	(0.078)	(0.072)	(0.091)	(0.089)	(0.074)	(0.045)
Global growth	3.132	0.948	2.050	2.959	1.228	-0.053	0.006	1.219	11.558	11.227
	(6.078)	(7.879)	(6.590)	(7.932)	(7.339)	(6.503)	(6.959)	(7.433)	(7.808)	(10.495)
Contagion Factors										
Regional	0.278	0.482**	0.268	0.190	0.311	0.166	0.097	0.194	-0.143	0.414
	(0.206)	(0.218)	(0.191)	(0.207)	(0.218)	(0.197)	(0.208)	(0.194)	(0.217)	(0.474)
Trade	1.297	-3.834	0.889	1.557	1.959	1.236	2.822	2.128	4.607	6.011
	(6.390)	(9.969)	(7.056)	(7.748)	(8.207)	(7.006)	(7.552)	(8.254)	(9.828)	(5.131)
Financial	1.111	4.497	2.110	1.975	2.373	2.119	2.481	2.705	1.686	1.779
	(2.141)	(4.592)	(2.841)	(3.001)	(3.256)	(2.643)	(3.438)	(3.759)	(3.299)	(1.385)
Domestic Factors										
Financial system	0.091	-0.324	-0.011	-0.263	0.047	0.155	0.799	-0.026	-0.545**	0.006
	(0.265)	(0.470)	(0.263)	(0.249)	(0.277)	(0.281)	(1.047)	(0.243)	(0.261)	(0.296)
Capital controls	0.123*	0.134	0.115	0.177**	0.177**	0.138*	0.114	0.148*	0.106	0.206*
	(0.074)	(0.140)	(0.071)	(0.081)	(0.083)	(0.077)	(0.073)	(0.079)	(0.065)	(0.116)
Debt to GDP	-0.005*	-0.005	-0.005**	-0.005	-0.002	-0.006**	-0.004	-0.005*	-0.002	0.004
	(0.003)	(0.007)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Growth shock	0.631	0.283	0.541	1.186	-0.165	0.543	0.436	-1.985	2.106**	-2.111**
	(0.837)	(0.811)	(0.801)	(0.797)	(1.010)	(0.773)	(0.840)	(7.274)	(0.806)	(0.662)
GDP per capita	0.005	0.017	0.004	-0.006	0.003	0.008	-0.004	0.001	0.017	-0.006
	(0.012)	(0.029)	(0.011)	(0.015)	(0.012)	(0.012)	(0.009)	(0.012)	(0.011)	(0.013)
			-0.210	-0.042	0.013*					
			(0.184)	(0.037)	(0.007)					
Sample Size	***3,255***	***3,459***	***3,459***	***2,908***	***2,954***	***3,330***	***3,304***	***3,287***	***3,459***	***2,290***

Notes: The dependent variable is a 0-1 variable indicating if there is an episode (either surge, stop, flight or retrenchment). Variables are defined in Section 4.1. Estimates are obtained using the complementary logarithmic framework with seemingly unrelated estimation across the four episodes and robust standard errors clustered by country. ** is significant at the 5% level and * at the 10% level. (1) Drops the recent crisis from 2008Q2 through 2009Q2 from the sample. (2) Additional control variables are included in the regression; for ER regime the control is a dummy equal to 1 if the country has a pegged exchange rate as defined in Shambaugh (2004); for Moodys the control is a numerical value for Moody's index, with a higher value indicating lower credit; TOT is the terms of trade as measured by the World Bank's "Net Barter Terms of Trade Index". (3) Global liquidity is measured as the growth in private credit by deposit money banks and other institutions to GDP. Financial system measures the soundness of the financial system as bank return on equity. Both variables are from Beck and Demirguc-Kunt (2009). (4) Growth shock is measured as the deviation between actual growth and forecasted growth, as forecast in the IMF's WEO in the previous spring. (5) Episodes are constructed by either including reserves in order to capture private and official flows instead of just private flows, or by using an HP filter with a 30% boundary.

Appendix Table 3d: Sensitivity Tests—Explaining Retrenchment Episodes

Global Factors	Drop Crisis[1]	Fixed Effects	Add ER Regime[2]	Add Moodys[2]	Add TOT[2]	Global Credit[3]	Financial System[3]	Growth Shock[4]	Inc. Official Flows[5]	HP Filter[5]
Global risk	0.021**	0.015**	0.015**	0.015**	0.015**	0.017**	0.015**	0.013**	0.027**	0.019**
	(0.010)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Global liquidity	-1.878	-0.971	-0.168	-0.501	-0.304	-0.050	-0.364	-0.346	-0.099	-0.413
	(1.296)	(1.182)	(1.067)	(1.068)	(1.136)	(0.253)	(1.113)	(1.030)	(1.196)	(1.120)
Global interest rates	0.134**	0.168**	0.106**	0.139**	0.118**	0.094**	0.079*	0.091**	0.056	0.020
	(0.051)	(0.059)	(0.046)	(0.053)	(0.044)	(0.047)	(0.048)	(0.046)	(0.041)	(0.038)
Global growth	-6.234*	-1.974	-4.499	-2.258	-3.202	-4.354	-6.067*	-4.625	-1.784	-9.758**
	(3.373)	(3.470)	(3.095)	(3.307)	(3.530)	(3.249)	(3.323)	(3.176)	(2.841)	(2.726)
Contagion Factors										
Regional	-0.183	-0.229	-0.243	-0.022	-0.345*	-0.284	-0.210	-0.204	0.525**	0.167
	(0.183)	(0.218)	(0.186)	(0.182)	(0.207)	(0.177)	(0.193)	(0.191)	(0.136)	(0.207)
Trade	7.087**	8.954**	8.753**	7.421**	10.232**	8.749**	9.170**	8.490**	7.346**	6.033**
	(2.751)	(2.725)	(2.628)	(2.973)	(2.705)	(2.628)	(2.681)	(2.778)	(1.968)	(2.429)
Financial	3.116**	4.695**	4.047**	4.473**	4.016**	3.982**	3.694**	3.661**	2.851**	2.255**
	(1.091)	(1.092)	(1.028)	(1.059)	(1.126)	(1.018)	(1.003)	(1.050)	(0.857)	(0.936)
Domestic Factors										
Financial system	0.117	0.752**	0.161	0.353*	0.150	0.200	-1.178	0.200	0.244	-0.435**
	(0.225)	(0.334)	(0.198)	(0.195)	(0.227)	(0.198)	(0.979)	(0.205)	(0.168)	(0.205)
Capital controls	0.033	-0.016	0.031	0.001	0.054	0.027	0.037	0.036	0.032	-0.013
	(0.062)	(0.121)	(0.064)	(0.077)	(0.071)	(0.067)	(0.067)	(0.065)	(0.058)	(0.091)
Debt to GDP	-0.004	-0.015**	-0.004	-0.005*	-0.003	-0.003	-0.003	-0.003	-0.003	-0.005
	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Growth shock	0.240	0.438	-0.092	-0.624	-0.812	-0.016	-0.213	-14.870**	-1.914**	0.071
	(1.083)	(1.022)	(0.950)	(1.061)	(1.193)	(0.906)	(0.849)	(4.445)	(0.734)	(0.992)
GDP per capita	0.013	0.025	0.013**	0.031**	0.013*	0.013	0.014**	0.015**	0.002	-0.012
	(0.008)	(0.016)	(0.007)	(0.011)	(0.007)	(0.009)	(0.006)	(0.006)	(0.007)	(0.012)
			-0.043	0.073**	0.007					
			(0.144)	(0.032)	(0.007)					
Sample Size	***3,255***	***3,459***	***3,459***	***2,908***	***2,954***	***3,330***	***3,304***	***3,287***	***3,459***	***2,290***

Notes: The dependent variable is a 0-1 variable indicating if there is an episode (either surge, stop, flight or retrenchment). Variables are defined in Section 4.1. Estimates are obtained using the complementary logarithmic framework with seemingly unrelated estimation across the four episodes and robust standard errors clustered by country. ** is significant at the 5% level and * at the 10% level. (1) Drops the recent crisis from 2008Q2 through 2009Q2 from the sample. (2) Additional control variables are included in the regression; for ER regime the control is a dummy equal to 1 if the country has a pegged exchange rate as defined in Shambaugh (2004); for Moodys the control is a numerical value for Moody's index, with a higher value indicating lower credit; TOT is the terms of trade as measured by the World Bank's "Net Barter Terms of Trade Index". (3) Global liquidity is measured as the growth in private credit by deposit money banks and other institutions to GDP. Financial system measures the soundness of the financial system as bank return on equity. Both variables are from Beck and Demirguc-Kunt (2009). (4) Growth shock is measured as the deviation between actual growth and forecasted growth, as forecast in the IMF's WEO in the previous spring. (5) Episodes are constructed by either including reserves in order to capture private and official flows instead of just private flows, or by using an HP filter with a 30% boundary.