Project Outline for Preconference for

NBER Project on the Global Financial Crisis

Surges, Stops, Flight and Retrenchment

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VERY PRELIMINARY UPDATE ON WORK IN PROGRESS

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Overview

International capital flows surged throughout the 2000s and then contracted sharply during the crisis of 2008-9. Many emerging markets worried about a "sudden stop" in capital inflows that would further aggravate their sharp economic slowdowns and increase macroeconomic instability. How did the crisis of 2008-9 affect international capital flows? What drove different patterns in different countries? What were the roles of domestic and foreign investors? What was the role of different types of capital flows—such as bank flows, equity, debt and direct investment? Was this period substantially different from historical episodes?

A complete analysis of these questions requires an understanding of *gross capital flows* prior to and during crises. To date the literature on sudden stops and capital flow "bonanzas" has been couched in terms of gross inflows, even though in practice it has focused on proxies for *net* capital inflows. As gross capital flows have increased dramatically over the past decade, however, it has become increasingly evident that the focus on net inflow proxies masks important information on the underlying flows. Moreover, one important aspect of capital flows during the most recent crisis seems to be a widespread retrenchment as domestic residents (including banks) withdrew money previously invested abroad—a pattern that has only recently received attention in the literature.[1]

To provide a deeper analysis of the dynamics of international capital flows, this paper will focus on gross inflows and gross outflows, instead of net capital flows, and will disaggregate flows by type of investor (foreign vs. domestic) and by type of flow (banking, direct investment, equity and debt). We will identify, in a broad sample of emerging and developed economies, episodes of abnormal gross capital flows when domestic or foreign investors substantially increase or decrease capital flows into or out of a country. We call these "surge", "stop", "flight" and "retrenchment" episodes (which are defined in more detail below). We hope to identify what

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[1] Two papers in progress that are closely related to this project also look at trends in gross capital flows and their relationship to crises. Milesi-Ferretti and Tille (2010) carefully documents trends in gross capital flows during the recent crisis and highlight the role of banking flows. Broner, Didier, Erce and Schmukler (2010) analyze how gross capital flows by domestic and foreign investors have related to business cycles and crises over time. Both papers discuss the pattern of retrenchment in gross capital flows during the recent crisis.

causes these episodes in different countries, as well as if these episodes are useful in predicting other events such as financial crises. We hope that our characterization and empirical analysis will shed light on important dynamics in international capital flows.

Defining the Episodes:

We focus on identifying four types of episodes in a sample of emerging markets and developed countries over time:

- "Surges": a sharp increase in capital inflows by foreigners
- "Stops": a sharp increase in capital outflows by foreigners
- "Flight": a sharp increase in capital outflows by domestic residents
- "Retrenchment": a sharp increase in capital inflows by domestic residents[2]

To identify these four types of episodes, our approach is similar in spirit to the sudden stops literature initiated in Calvo (1998), but there are three important differences. First, we utilize capital flows data, rather than current-account-based proxies for flows. Second, we utilize data on gross flows instead of net flows. Third, we examine different types of episodes, including sudden increases in capital flows instead of just sudden decreases and changes by domestic as well as foreign residents.[3]

More specifically, we calculate year-over-year changes in four-quarter gross capital flows by domestic and foreign investors and define episodes by three criteria: (1) current year-over-year changes in four-quarter gross capital flows by the relevant group of investors is more than two standard deviations above or below the historical average (calculated over the last four years) 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 by the relevant set of

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[2] Recall that in BOP accounting terms an outflow is a negative value. Milesi-Ferretti and Tille (2010) also use the term retrenchment to capture the sharp increase in foreign investments brought home during the recent crisis.

[3] This generally approach to identifying "sudden stop" episodes was developed in Calvo (1998) and then expanded on in a series of papers such as Calvo, Izquierdo and Meija (2004, 2008). Reinhart and Reinhart (2009) use this framework to identify "capital flow bonanzas" (which are somewhat similar to the "sudden surges" in this paper). None of those papers analyzes gross flows, and each uses a proxy for net capital inflows based not on flows but on current account balances.

investors is more than one standard deviation above or below the historical average; (3) the length of the episode is greater than one quarter.[4]

To provide a concrete example, to calculate surge episodes we use the following methodology. Let C_t be a 4-quarter moving sum of gross capital inflows from foreigners (GINFOR):

$$C_t = \sum_{i=0}^{3} GINFOR_{t-i} \qquad\qquad t = 1, 2, ..., N \qquad\qquad (1)$$

Then compute annual year-over-year changes in C_t:

$$\Delta C_t = C_t - C_{t-4} \qquad\qquad t = 1, 2, ..., N \qquad\qquad (2)$$

Next, compute rolling means and standard deviations of ΔC_t over the last 5 years (20 quarters) and require that all countries have at least 4 years worth of data. 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 is defined as a period when gross inflows from foreigners fall one standard deviation below its mean, providing it reaches two standard deviations below at some point. The episode ends when gross inflows from foreigners are no longer at least one standard deviation below its mean.

Figure 1 shows an example of how surges and stops are defined for Brazil from 1990 through the end of 2009. The solid black line is the change in annual capital inflows. 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 bands plus or minus two standard deviations. An episode is classified as a sudden stop if annual capital flows falls 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

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[4] We sum capital flows over four quarters in order to avoid seasonal fluctuations. The historical average is calculated over the last five years (20 quarters).

deviation line and ending when it again crosses back over the same line. According to these criteria, four periods qualify as sudden stops: from 1993Q1 to 1993Q3 (a period of hyperinflation in Brazil), from 1995Q1 to 1995Q2 (the Mexican peso crisis), from 1999Q1 to 1999Q2 (the Brazilian devaluation) and from 2008Q2 to 2009Q3 (the most recent global crisis). Although this is far from a formal analysis, it suggests that sudden stops can be caused by a mix of domestic, regional and global shocks.

Figure 1 also shows the classification of sudden surges for Brazil. An episode is classified 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 again crosses back over the same line. According to these criteria, four periods qualify as sudden surges: from 1990Q2 to 1991Q1 (after Brazil elected a new president, Fernando Collor de Mello, in its first democratic election in decades and had high hopes that inflation would be defeated), from 1994Q1 to 1994Q3 (just before the Mexican peso crisis), from 1995Q4 to 1996Q2 (a period of strong capital flows to many emerging markets before the Asian crisis), from 2006Q3 to 2007Q4 (just before the recent crisis). Again, while not a formal analysis, this suggests that sudden surges can be driven by domestic or global factors and can precede crises.

Episodes of flight and retrenchment are defined similarly, taking into account that in BOP accounting terms, outflows by domestic residents are reported with a negative value. In other words, when domestic investors are acquiring foreign securities, gross flows by domestic investors are negative. A sudden flight episode therefore occurs when gross outflows fall one standard deviation below its mean, providing 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.

Data

In order to identify these episodes, we use data on quarterly gross capital inflows and outflows from the International Monetary Fund's International Financial Statistics, accessed through Haver Analytics on 06/16/10. We include all countries for which quarterly data for the balance of payments flow data is available for at least ten years. Data ends in Q42009, after which flow data are not available for most countries.[5] The resulting sample consists of 56 countries listed in Appendix A.[6] Some countries do not provide data until later in the sample period, so the bottom of Appendix A lists country coverage (for gross inflows and outflows) at the start of selected years in the sample.[7] In 2007, our sample includes $10,695 billion of gross capital inflows, capturing about 95% of global capital inflows recorded by the IMF.[8]

Episodes: Total Capital Flows

Using this data and the definitions above, Figure 2 shows <u>preliminary</u> results of the incidence of surge, stop, flight and retrenchment episodes in the sample from 1980 through the end of 2009. Table 1 lists, by country, summary statistics for each episode since 1985. Over this period, there are 162 surge episodes, 211 stop episodes, 180 flight episodes and 203 retrenchment episodes. The average length of each episode also differs; surge episodes tend to last the longest with an average length of 4.5 quarters. Retrenchment, stop and flight episodes all have a similar length of 3.8, 3.9, and 4.1 quarters, respectively.

The graphs in Figure 2 suggest that from a capital flows perspective, the crisis of 2008-9 was defined by two characteristics: "sudden retrenchments" and "sudden stops". Investors from an unprecedented number of countries retrenched from international markets—perhaps owing to a

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[5] All data are in billions of US$.

[6] Several major countries that are not included in the sample are China, Singapore and Taiwan, which do not report quarterly capital flow data.

[7] We define capital inflows as the sum of inflows of direct investment, portfolio inflows and other inflows. We define outflows as the sum of direct investment outflows, portfolio outflows, and other outflows. We have also done sensitivity analyses in which 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. This has a minimal effect on the definitions of episodes. We have also done sensitivity analyses in which we include changes in reserves in the measure of capital outflows. This does affect the definitions of flight and retrenchment episodes for a number of countries, and we plan to explore the impact of these changes in the empirical analysis.

[8] Estimates based on worldwide financial account liabilities (inflows) of $11,249 bn in 2007 as reported in IMF, BOP (CD-ROM for 01/10).

general increase in risk aversion and need for liquidity—and suddenly brought investment home. 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. As Figure 2 shows, during the 4th quarter of 2008, 65% of the sample experienced this "sudden retrenchment" effect. In contrast, in the 4th quarter of 1998 (after the collapse of LTCM), and in the 3rd quarter of 2001 (after the collapse of the technology bubble) only 20% and 39% of the sample, respectively, experienced a similar effect.

Also, although a majority of countries experienced this sudden retrenchment effect in the most recent crisis as domestic residents sold foreign investments, there are important differences across countries and many countries' residents did not unwind foreign positions. For example, Figure 3 shows gross capital outflows by residents of Poland and Greece—with a negative sign indicating gross outflows as is standard in balance of payments accounting. During late 2008 and early 2009, there was more widespread concern about the outlook for Eastern Europe and Poland than Greece, and yet Poland was the country that experienced a sudden retrenchment episode; 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? Did this reflect a desire by domestic citizens in these countries to keep investments abroad as they perceived greater risks at home? Or did this reflect less of an urgent need for liquidity that could force domestic citizens to sell foreign investments?

Figure 2 also shows the number of sudden stop episodes over time. With so many countries retrenching during the crisis of 2008-2009, it is not surprising that there was a spike in the incidence of sudden stops to 77% 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 top of Table 3 shows this strong correlation between stop and retrenchment episodes—especially during the most recent crisis (at the right of the Figure). However, the historical patterns suggest that a strong correlation between these two types of episodes does not exist during all crises. For example, in 1998q4 the incidence of stop and retrenchment episodes were both elevated (at 32%

and 20%, respectively) as risk aversion increased after the collapse of LTCM. But as risk aversion 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 16%.

Moreover, while three-quarters of the sample experienced a "sudden stop" during the recent crisis, others still received inflows from foreigners and did not experience a sudden stop. For example, several countries that did NOT have a sudden stop episode in the 4th quarter of 2008 or 1st quarter of 2009 include Australia, Finland, Greece, Indonesia, and the Slovak Republic. Why did investment by foreigners into these countries not slow as dramatically during the most recent crisis?

Figure 2 also includes episodes of "sudden surges" of investment from foreigners as well as "sudden flight" (in which domestic investors increase their purchases of foreign securities). In 2007, over one-quarter of the countries experienced a surge in inflows before the crisis. Is there any relationship between these surge episodes and the severity of the economic slowdown or crisis in 2008? As indicated in the top of Table 3, there is a high correlation of 38% between surge and flight episodes. Does this overlap between surges by foreign investors with a simultaneous flight by domestic residents indicate a general reduction in home bias and/or decrease in risk aversion is a major determinant of these episodes?

Also, a closer examination of the flight episodes suggests that some episodes that were previously identified as "sudden stops" may actually be a "sudden flight" of domestic residents sending capital abroad rather than a sharp reduction in foreign investment.[9] For example, Malaysia experienced a sudden flight from 2006Q2 to 2007Q4 and did not experience a sudden stop during the Asian crisis in 2007 (which undermines the claims by Prime Minister Mahatir that the crisis was caused by foreigners withdrawing funds). The only sudden stop episode for

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[9] Rothenberg and Warnock (2009) also make this point and show that about half of the episodes previously defined as sudden stops were caused by the "flight" of local investors (while the other half was primarily the retreat of global investors—as generally believed). They use different definitions, however, and define sudden flight as an episode in which gross capital outflows increase more than gross capital inflows decrease. They define "true sudden stops" as episodes in which gross capital inflows decrease more than gross capital outflows increase.

Malaysia around this time occurred in 2008Q3 and 2008Q4—after capital controls were enacted in September 2008.

There are numerous other trends and patterns that can be explored in these figures and tables that show the occurrence of sudden surges, stops, flight and retrenchment. A key focus of this research paper will be to better understand what causes these episodes, and why there are differences across countries. Only by focusing on gross flows and the different behavior by domestic and foreign investors can such dynamics be understood.

Episodes: By Type of Capital Flows

The discussion above focused on trends in total gross capital inflows and outflows. These aggregate measures of gross capital flows can, however, mask important differences for different types of capital flows. Therefore, as a next step Figure 4 graphs the incidence of each of the four episodes (surges, stops, flight and retrenchment) for four major types of capital flows (direct investment, debt, equity and banking). We are just beginning our analysis of these episodes for various types of capital flows, but an initial look at these graphs suggests that a decomposition of the types of capital flows may be useful in order to better understand these episodes.

For example, Figure 4 suggests that the large number of stop and retrenchment episodes in total capital flows during the recent crisis (as shown in Figure 2) are largely driven by a sudden stop and retrenchment in banking and equity flows. Flows in debt and direct investment also show an increase in stop and retrenchment episodes, but these are not as widespread as for banking and equity flows. Another noteworthy pattern in these graphs is the volatility in the percent of the sample having surge, stop, flight and retrenchment episodes for direct investment. Capital flows through direct investment are generally believed to be less volatile than capital flows through equity or debt, but Figure 4 suggests that flows in direct investment may also experience substantial fluctuations.

Next Steps

After further exploring trends in these episodes of surges, stops, flight and retrenchment, this project will examine which global, regional, and country characteristics determine the occurrence of these episodes. For example, what is the role of domestic versus global economic factors? What is the role of regional contagion? What is the role of liquidity, risk aversion, prior investment flows, etc? How do these factors differ for episodes of different types of flows (equity, debt, FDI and banking)?

The more formal regression analysis will hopefully identify a series of variables that can predict whether a country will experience a sudden surge, stop, flight or retrenchment episode in capital flows. This analysis will build on the existing literatures on the cross-country allocation of investment and on contagion through capital flows.[10] We will also perform an extension of this analysis to identify which variables determine whether countries were more likely to have the above episodes during the crisis of 2008-2009 and see if there was a structural difference during this period.

After performing this analysis to better understand the causes of surges, stops, flight and retrenchment, we hope to use the results to evaluate various models of investment across countries and during crises, possibly developing our own framework if necessary. For example, the high correlation between stop and retrenchment episodes during crises suggests the importance of a global factor—such as an increase in risk aversion, decrease in liquidity, or increase in home bias that causes investors around the world to bring money home. Our results will hopefully shed light on important policy questions such as why some countries were net recipients of capital during the most recent crisis, while others experienced sharp capital outflows that exacerbated recessions.

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[10] For examples of 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). For examples of the literature on contagion through capital flows, see Broner, Gelos, and Reinhart (2006), Chinn and Forbes (2004), Forbes (2004), Kaminsky, Reinhart, and Vegh (2003) and Kaminsky, Lyons and Schmukler (2001).

Finally, while the base dataset for this project will be country-level aggregate gross flows data (e.g., "country A's gross inflows and outflows vis-à-vis the rest of the world"), we also plan to compile and analyze the adequacy of available country-level information on bilateral capital flows across countries.[11] The United States reports bilateral information on capital flows, and the ECB has recently rolled out a new data collection system that will improve the accuracy of its capital flows data (although revised and improved historical time series might not be available for some or many countries). Other countries may also have historical information on bilateral flows and investment positions that have not been used in the academic literature. We are not aware of any effort to carefully explore across a wide range of countries what sources of *accurate* data on bilateral capital flows are available, and as part of this project we plan to catalog what is available and document what data is appropriate for economic analysis. If we are able to identify appropriate information on bilateral capital flows, we plan to extend the analysis described above to better understand the dynamics of international capital flows.

Questions for Discussion:
- Are we defining episodes correctly?
- Are there data sources on bilateral capital flows (other than TIC data for US and ECB data)?
- Any suggestions for models/framework for empirical analysis?

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[11] This will build on previous articles on the nature and quality of capital flows data, such as ECB (2010), Curcuru, Thomas, and Warnock (2009), McGuire and von Peter (2009), Bertaut, Griever, and Tryon (2006), Warnock and Cleaver (2003), and Griever, Lee, and Warnock (2001).

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Appendix A: Country and Sample Representation

Argentina	Korea
Australia	Latvia
Austria	Lithuania
Bangladesh	Malaysia
Belgium/Luxembourg	Mexico
Bolivia	Netherlands
Brazil	New Zealand
Canada	Nicaragua
Chile	Norway
Colombia	Panama
Croatia	Peru
Czech Republic	Philippines
Denmark	Poland
Estonia	Portugal
Finland	Romania
France	Russia
Germany	Slovak Republic
Greece	Slovenia
Guatemala	South Africa
Hong Kong	Spain
Hungary	Sri Lanka
Iceland	Sweden
India	Switzerland
Indonesia	Thailand
Ireland	Turkey
Israel	UK
Italy	US
Japan	Venezuela

Date	# Countries with data on inflows (outflows)[12]
1980	32 (32)
1985	36 (36)
1990	38 (38)
1995	51 (48)
2000	56 (55)
2005	56 (56)
2007	56 (56)
2008	56 (56)
2009	50 (50)

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[12] As of the 1st quarter of the year.

Table 1
Summary Statistics for Episodes (1980-2009)

	Surge	Stop	Flight	Retrenchment
# of episodes	162	211	180	203
Average length of episode (in quarters)	4.5	3.9	4.1	3.8
% chance of having an episode each quarter	14.9%	17.2%	15.3%	16.5%

Table 2
Surge, Stop, Flight and Retrenchment Episodes by Country:
Total Capital Flows from 1985 to 2009

Country	Surges		Stops		Flight		Retrenchment	
	Start	End	Start	End	Start	End	Start	End
Argentina	1990q4	1992q3	1989q2	1990q3	1989q3	1990q1	1988q3	1989q1
	2003q1	2003q4	1994q4	1995q1	1991q2	1992q3	1992q4	1993q2
			1998q4	1999q3	2002q4	2003q1	1998q3	1999q2
			2000q4	2002q2	2006q3	2007q3	2009q2	2009q4
			2008q2	2009q3	2008q1	2008q3		
Australia	1993q4	1994q3	1989q3	1991q3	1995q4	1996q3	1989q2	1991q1
	1995q3	1996q3	1997q3	1998q1	2004q1	2004q3	1994q4	1995q2
	2002q3	2002q4	1998q3	1998q4	2006q2	2007q1	2003q1	2003q3
	2003q4	2004q3	2005q1	2005q4			2005q1	2005q4
	2006q2	2007q1						
Austria	1992q2	1993q1	1996q4	1997q1	1992q2	1993q1	1986q1	1986q2
	1999q2	2000q1	2001q1	2002q1	1997q2	1998q1	1993q3	1993q4
	2005q1	2005q4	2006q1	2006q4	1999q2	2000q1	1998q2	1998q3
			2008q3	2009q4	2005q1	2005q4	2001q2	2002q1
							2006q1	2006q4
							2008q4	2009q4
Bangladesh	1989q1	1989q4	1991q3	1992q1	1987q1	1987q3	1992q2	1993q1
	1998q1	1998q3			1988q2	1989q3	2001q1	2001q2
	2003q4	2004q1			1995q3	1997q1		
	2005q1	2005q2			2008q2	2008q4		
BelLux	1987q1	1987q4	1988q2	1989q1	1987q1	1987q4	1988q2	1989q1
	1999q3	2000q3	1994q1	1995q1	1999q3	2000q3	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		
Brazil	1988q1	1988q4	1993q1	1993q3	1987q4	1988q3	1985q2	1985q4
	1990q2	1991q1	1995q1	1995q2	1994q2	1994q4	1992q1	1992q4
	1994q1	1994q3	1999q1	1999q2	1998q3	1999q2	1995q2	1996q1
	1995q4	1996q2	2008q2	2009q3	2006q4	2007q3	1997q4	1998q2
	2006q3	2007q4					2008q2	2008q3
Canada	1996q4	1997q3	1991q2	1991q3	1986q2	1986q4	1993q2	1993q3
	2000q1	2001q1	1995q2	1996q1	1994q2	1994q4	1995q2	1996q1
	2006q2	2007q1	1999q1	1999q4	1996q3	1997q2	1998q1	1998q3

			2008q4	2009q2	2000q1	2001q1	2008q2	2009q3
					2006q2	2007q1		
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	2008q4	2006q2	2006q3	2002q2	2003q1
							2007q2	2007q3
Croatia	2002q4	2004q1	1998q4	1999q2	2000q1	2000q4	2001q3	2002q1
			2004q4	2005q3	2002q4	2003q4	2004q4	2005q4
					2006q4	2007q3		
CzechRepublic	2002q3	2003q1	2003q2	2004q1	2003q3	2005q1	2000q1	2000q4
	2007q3	2008q3	2006q2	2006q4			2002q1	2002q3
			2009q1	2009q2			2008q4	2009q2
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	2009q3				
Estonia	1997q4	1998q1	1998q3	1999q3	1997q4	1998q1	1998q4	1999q1
	2003q1	2005q1	2008q2	2009q4	2001q1	2001q2	2000q1	2000q2
					2004q2	2005q3	2008q2	2009q3
Finland	1987q1	1987q4	1985q4	1986q2	1985q1	1985q2	1985q4	1986q2
	1996q3	1997q3	1991q1	1992q2	1986q3	1987q1	1987q3	1987q4
	1998q4	1999q1	2001q1	2001q4	1988q3	1989q1	1990q3	1990q4
	2004q3	2004q4	2009q2	2009q3	1993q1	1993q3	1992q1	1992q3
	2006q2	2007q1			1998q4	1999q1	2001q1	2001q4
					2004q3	2005q1	2008q4	2009q3
					2006q2	2006q4		
France	1986q3	1987q4	1991q1	1992q1	1986q4	1987q4	1991q2	1992q1
	1997q4	1998q3	2001q4	2002q3	1992q3	1992q4	2001q4	2002q3
	2001q1	2001q2	2008q1	2009q3	1997q4	1998q3	2008q1	2009q3
					2001q1	2001q2		
Germany	1986q1	1986q4	1987q4	1988q3	1985q4	1986q4	1987q3	1988q2
	1989q2	1990q1	1994q1	1994q4	1993q1	1993q4	1990q4	1992q2
	1992q3	1993q2	2001q1	2002q2	2004q3	2005q4	1994q2	1994q4
	2005q1	2005q4	2008q3	2009q3			2000q4	2002q2
	2007q2	2008q1					2008q3	2009q3
Greece	1989q4	1991q1	1992q1	1992q4	2001q3	2001q4	1997q2	1997q4
	1995q1	1995q2	1995q4	1996q2	2005q1	2005q3	2006q1	2006q4
	1996q4	1997q2	1997q3	1997q4				
	2005q1	2005q4	2006q1	2006q4				
			2009q2	2009q3				

Guatemala	1987q4	1988q1	1994q4	1995q3	1990q3	1991q2	1988q3	1988q4
			2008q4	2009q3			1989q2	1990q1
							1991q3	1992q1
							2008q4	2009q3
HongKong			2008q3	2009q3			2008q3	2009q3
	2003q1	2003q4	1996q4	1997q1	1995q3	1995q4	2008q4	2009q3
	2005q1	2005q3	2002q2	2002q3	2001q2	2002q1		
	2006q3	2008q1	2008q4	2009q3	2003q4	2004q3		
					2006q1	2008q1		
Iceland	1987q1	1987q4	1989q2	1990q1	1986q3	1987q2	1992q1	1992q3
	1995q4	1996q4	2001q2	2002q1	1993q2	1993q3	2001q3	2002q2
	2003q3	2006q1	2008q1	2009q2	1997q3	1998q2	2006q4	2007q1
					1999q1	1999q4	2008q2	2009q2
					2003q1	2006q1		
India	1993q4	1994q4	1989q4	1990q4	1990q3	1990q4	2007q4	2008q2
	2006q4	2008q1	1991q3	1992q1	2005q4	2006q4		
			2008q3	2009q1				
Indonesia	1990q3	1991q2	1993q2	1993q3	1993q3	1994q3	1997q4	1998q2
	1995q2	1996q3	1997q4	1998q3	2002q3	2003q2	2006q3	2007q1
	2005q4	2006q1	2006q4	2007q1	2005q4	2006q2		
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	1988q3	1989q2	1986q2	1987q1	1991q1	1991q3
	1989q4	1990q3	1996q3	1996q4	1992q1	1992q3	1993q3	1993q4
	1999q2	2000q1	1998q3	1998q4	1998q1	1998q4	1995q2	1995q3
	2006q1	2006q4	2001q3	2002q2	2006q1	2006q4	2001q2	2002q2
			2007q3	2007q4			2007q3	2009q3
			2008q4	2009q2				
Italy	1987q1	1987q3	1991q4	1992q2	1987q1	1987q3	1986q1	1986q2
	1996q1	1997q1	1992q4	1993q3	2003q1	2003q4	1993q1	1993q3
	2003q1	2003q4	1999q1	1999q2	2005q1	2005q4	2000q3	2002q3
	2005q2	2006q1	2000q4	2002q3			2007q3	2009q1
			2008q2	2009q1				
Japan	1986q2	1987q3	1990q4	1991q4	1986q1	1987q2	1987q4	1988q3
	1993q4	1995q1	1992q2	1993q1	1993q4	1994q4	1990q3	1991q3
	2000q2	2001q1	1998q1	1999q1	2000q2	2001q1	1996q3	1996q4
			2005q2	2005q3			1998q2	1999q4
			2006q3	2007q1			2008q3	2009q3
			2008q3	2009q3				

Korea	1988q2	1989q1	1986q3	1987q4	1985q2	1985q4	1987q4	1988q1
	1990q2	1991q2	1997q2	1998q3	1988q4	1989q1	1997q3	1999q1
	1994q3	1995q4	2008q2	2009q3	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	2009q3			2008q3	2009q3
	2006q4	2007q4						
Malaysia			2005q4	2006q3	2006q2	2007q4	2008q3	2008q4
			2008q3	2008q4				
Mexico	1989q2	1991q2	1994q4	1995q4	1987q3	1988q2	1991q3	1991q4
	2007q3	2008q2	2008q4	2009q3	1990q1	1990q4	1992q2	1993q1
					1993q2	1993q4	2008q4	2009q3
					2001q4	2002q2		
Netherlands	1985q3	1987q1	1990q4	1991q4	1986q2	1987q1	1990q4	1992q1
	1995q3	1996q2	2001q2	2001q3	1997q4	1998q4	2001q2	2001q3
	1997q4	1998q4	2002q1	2002q4	2005q2	2006q2	2002q1	2002q4
	2005q2	2006q2	2008q1	2009q3			2008q1	2009q3
NewZealand	1986q3	1987q2	1987q4	1988q3	1986q4	1987q2	1986q1	1986q2
	2000q1	2001q1	1996q4	1997q2	1989q2	1990q2	1988q1	1989q1
	2006q3	2007q3	2008q2	2009q2	1993q3	1994q2	2001q2	2001q3
					2006q3	2007q3	2002q4	2003q3
							2005q3	2006q1
Nicaragua			2000q3	2001q3	2000q4	2001q2	1998q1	1998q4
							2002q4	2003q2
Norway	2002q4	2003q2	1988q3	1989q2	1986q3	1987q3	1987q4	1988q4
	2005q4	2007q1	1991q3	1991q4	2000q2	2001q2	2001q4	2002q3
			2001q3	2002q1	2005q4	2007q1	2007q4	2008q3
			2007q4	2008q4				
Panama			2008q4	2009q4			2008q4	2009q3
Peru	2006q4	2008q2	1998q1	1998q2	2001q1	2001q2	2007q1	2007q2
			1998q4	1999q3	2003q2	2004q1	2007q4	2008q4
			2005q4	2006q1	2005q4	2006q3		
			2008q4	2009q3	2009q2	2009q3		
Philippines	1994q2	1994q3	1992q1	1992q2	1991q4	1994q2	1997q3	1998q2
	1996q1	1997q1	1997q3	1998q4	1999q1	1999q2	2008q1	2008q4
	2005q2	2005q4	2008q1	2009q1	2007q1	2007q2		
	2007q1	2007q3						
Poland	2007q1	2008q2	2008q4	2009q3	1990q4	1991q1	1991q3	1991q4
							1993q2	1993q3
							2008q3	2009q3

Portugal	1987q3	1988q2	1992q3	1993q2	1990q2	1991q2	1987q4	1988q1
	1988q4	1990q2	1996q2	1996q3	1993q1	1993q4	1989q4	1990q1
	1994q3	1995q3	1999q3	1999q4	2003q3	2004q1	1992q1	1992q2
	2000q1	2000q4	2002q4	2003q1			1996q1	1996q3
	2003q4	2004q2	2004q4	2005q2			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	2007q2	2008q1	2006q2	2006q3	2002q4	2004q2	2001q3	2002q2
			2008q4	2009q4	2007q2	2009q1	2009q3	2009q4
SlovakRep			1998q4	1999q4	2008q2	2008q3	1999q1	1999q2
Slovenia	2002q3	2003q3	1998q1	1998q2	1998q3	1999q2	2008q1	2009q2
	2007q1	2007q4	2003q4	2004q2	2002q4	2003q3		
			2008q3	2009q2	2007q1	2007q4		
SouthAfrica	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	1985q2	1986q2	1988q2	1989q1	1987q1	1987q3
	1990q4	1991q3	1992q1	1992q2	1990q1	1991q2	1991q4	1992q1
			1994q2	1995q1	1992q3	1993q4	1994q2	1995q1
			2001q3	2002q2			2001q3	2002q2
			2008q1	2009q4			2007q3	2009q3
SriLanka	1989q4	1990q3	1994q2	1994q3	1990q3	1991q2	1990q1	1990q2
	2000q1	2000q4	1995q4	1996q1	1995q1	1995q3	1993q2	1994q3
			1998q3	1999q1	2007q3	2008q1	1998q4	1999q1
			2001q2	2002q1			2001q4	2002q3
			2008q1	2008q2				
Sweden	1985q3	1987q3	2001q4	2002q4	1986q2	1988q1	1991q1	1992q1
	1989q2	1990q4	2008q4	2009q3	1988q4	1990q3	1997q1	1997q3
	1998q1	1998q4			1995q3	1996q3	2000q2	2000q3
	2004q4	2005q2					2001q1	2002q3
							2008q1	2009q3
Switzerland	2005q3	2006q2	2008q1	2009q1	2005q3	2006q1	2008q1	2009q1
Thailand	1987q4	1990q3	1992q1	1992q4	1985q2	1986q1	1986q4	1988q4
	1995q2	1995q4	2007q1	2007q4	1989q3	1990q2	1991q2	1991q4
	2004q3	2006q1	2008q3	2009q2	1995q3	1995q4	1994q4	1995q1
							2008q1	2008q4
Turkey	1990q1	1990q4	1991q3	1991q4	1991q1	1991q2	1994q3	1995q3
	1992q3	1993q4	1994q2	1995q1	1995q4	1996q3	2007q4	2008q2

	2000q1	2000q3	2001q1	2001q4	2006q4	2007q3		
			2007q4	2008q2				
			2008q4	2009q2				
UK	1985q3	1987q2	1990q1	1990q3	1985q4	1987q2	1991q3	1992q2
	1992q3	1993q4	1991q3	1992q1	1992q4	1993q2	1998q1	1998q4
			1994q2	1994q4	2000q3	2000q4	2001q3	2002q2
			1998q1	1998q4			2008q2	2009q2
			2001q3	2002q2				
			2008q2	2009q2				
US	1992q3	1992q4	1988q3	1988q4	1986q2	1986q4	1990q3	1990q4
	1993q3	1994q3	1989q4	1990q4	1993q3	1994q2		
	1999q4	2000q3	1998q1	1999q1	2004q1	2004q4		
	2006q4	2007q2	2001q3	2002q2	2006q4	2007q3		
			2008q1	2009q2				
Venezuela	2003q4	2004q1	2006q2	2006q4	2005q2	2006q2	2001q1	2001q4
	2005q2	2005q4					2006q4	2007q1
	2007q2	2008q1					2008q4	2009q3

Table 3
Correlations in Episodes During Full Period & Recent Crisis

Full Period: 1985Q1 to 2009Q4   *Crisis: 2007Q1 to 2009Q4*

Total Capital Flows

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.194	**1.000**	
Flight	0.379	-0.139	**1.000**
Retren	-0.146	0.482	-0.189

(obs=4111)

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.300	**1.000**	
Flight	0.385	-0.200	**1.000**
Retren	-0.198	0.597	-0.254

(obs=590)

Debt

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.181	**1.000**	
Flight	0.076	-0.057	**1.000**
Retren	0.016	0.124	-0.191

(obs=3971)

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.208	**1.000**	
Flight	0.031	-0.111	**1.000**
Retren	-0.019	0.130	-0.222

(obs=566)

Equity

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.198	**1.000**	
Flight	0.119	0.009	**1.000**
Retren	0.008	0.172	-0.181

(obs=3940)

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.278	**1.000**	
Flight	0.036	-0.044	**1.000**
Retren	-0.003	0.181	-0.248

(obs=582)

Direct Investment

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.220	**1.000**	
Flight	0.160	-0.092	**1.000**
Retren	-0.072	0.206	-0.200

(obs=4186)

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.211	**1.000**	
Flight	0.136	-0.136	**1.000**
Retren	-0.057	0.320	-0.228

(obs=590)

Banking

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.170	**1.000**	
Flight	0.209	-0.074	**1.000**
Retren	-0.076	0.257	-0.148

(obs=3968)

	Surge	Stop	Flight
Surge	**1.000**		
Stop	-0.313	**1.000**	
Flight	0.194	-0.087	**1.000**
Retren	-0.204	0.391	-0.180

(obs=563)

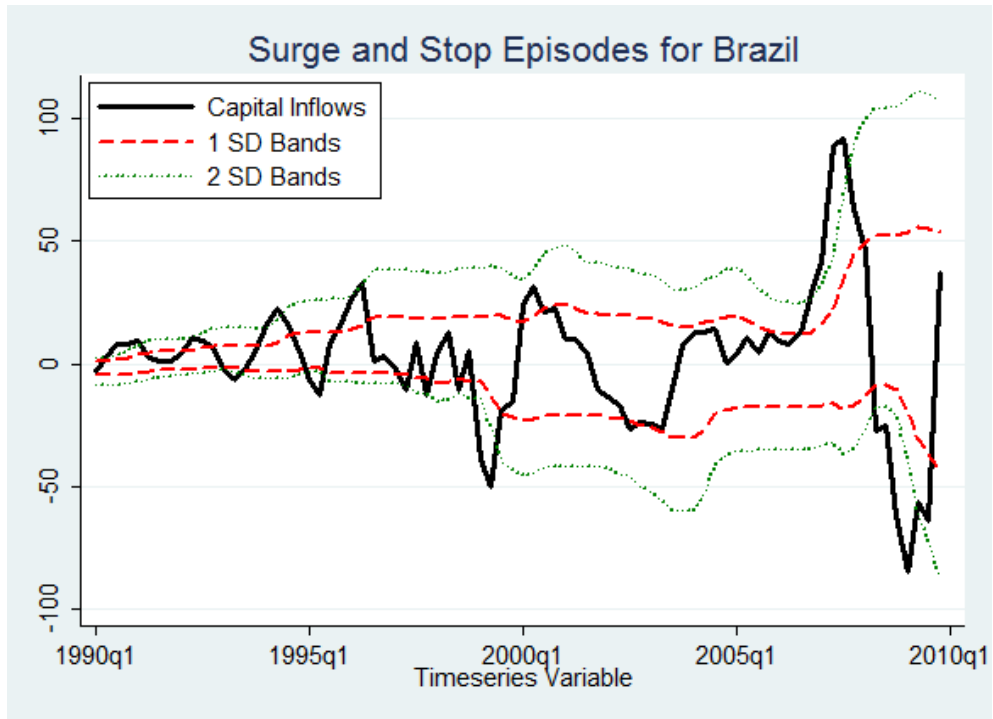**Figure 1**

Surge and Stop Episodes for Brazil

Figure 2
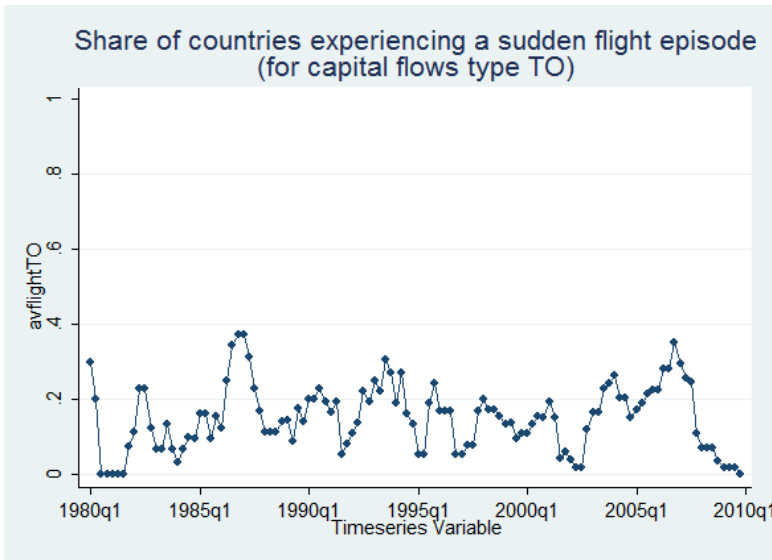**Percent of Countries with Each Type of Episode:**
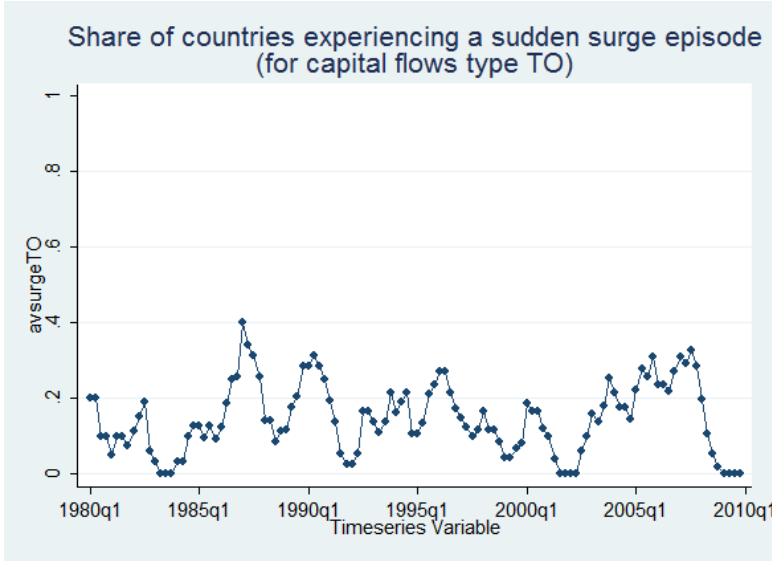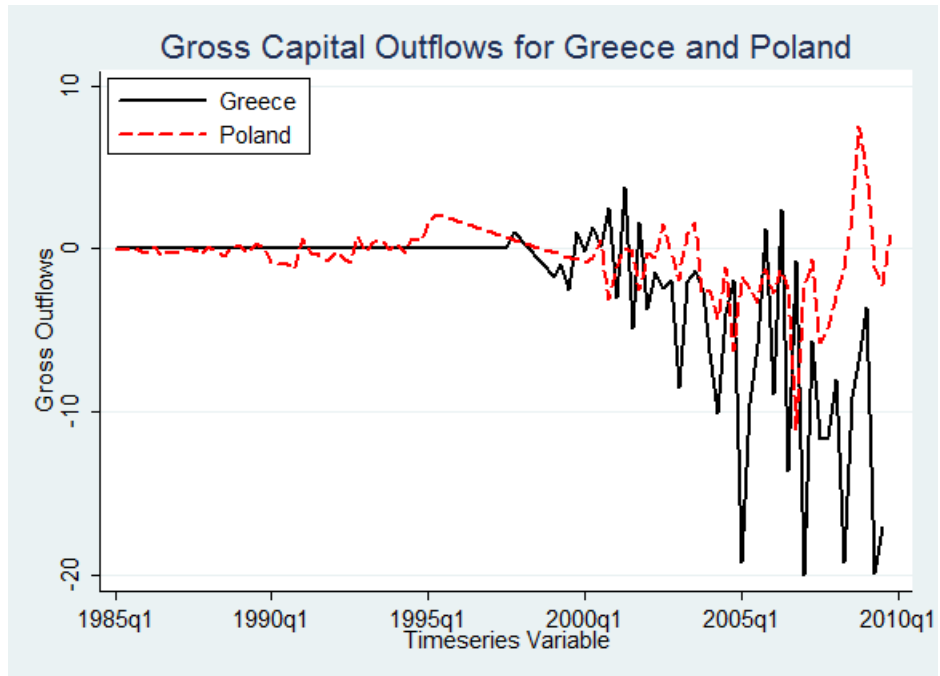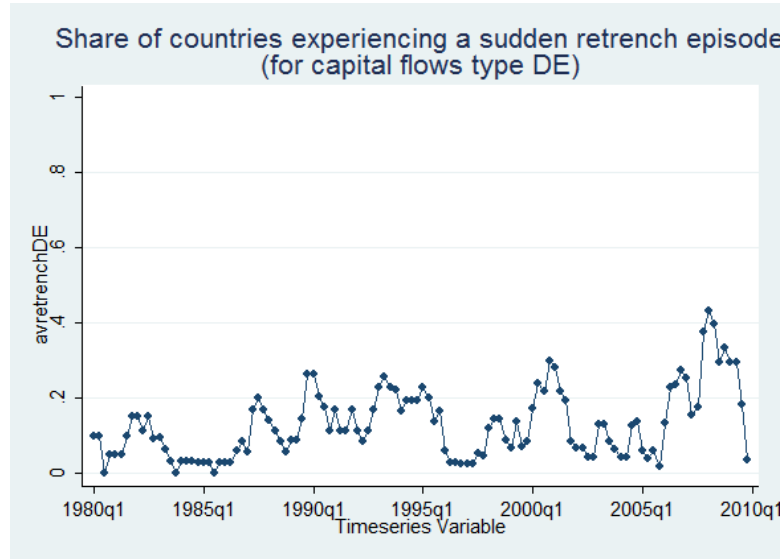**Based on Total Capital Flows**

Share of countries experiencing a sudden surge episode
(for capital flows type TO)

Share of countries experiencing a sudden stop episode
(for capital flows type TO)

Share of countries experiencing a sudden flight episode
(for capital flows type TO)

Share of countries experiencing a sudden retrench episode
(for capital flows type TO)

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Figure 3

Gross Capital Outflows for Greece and Poland

Figure 4a
Percent of Countries with Each Type of Episode:
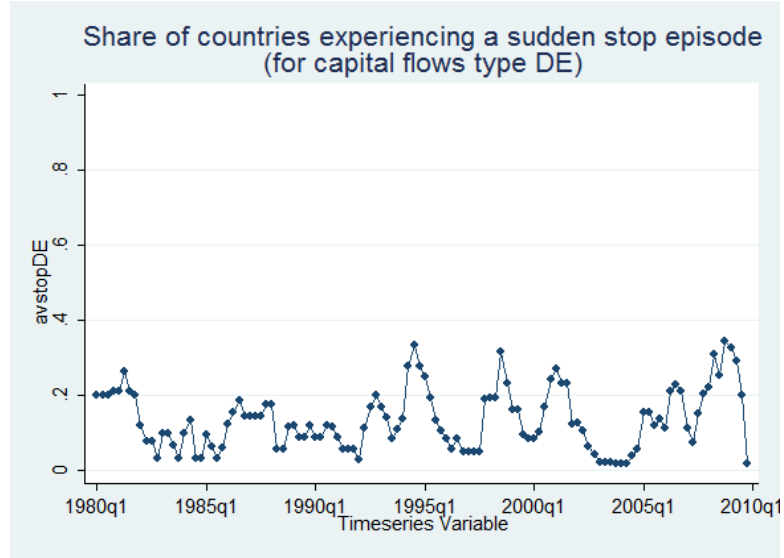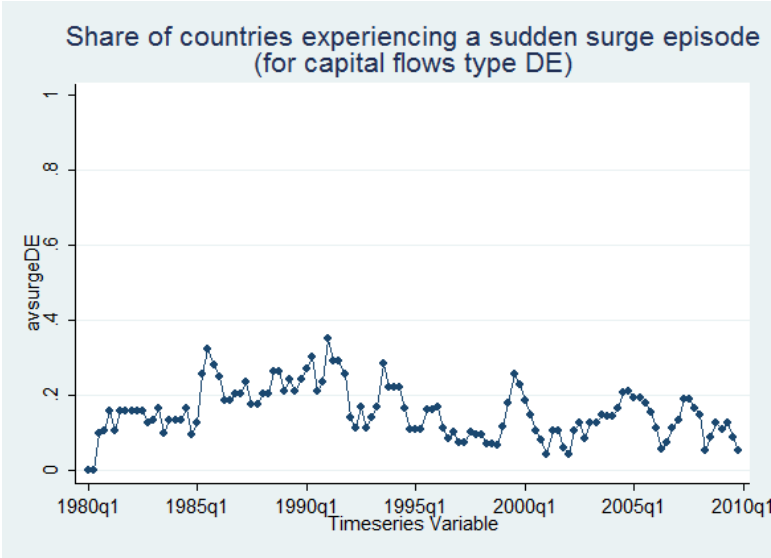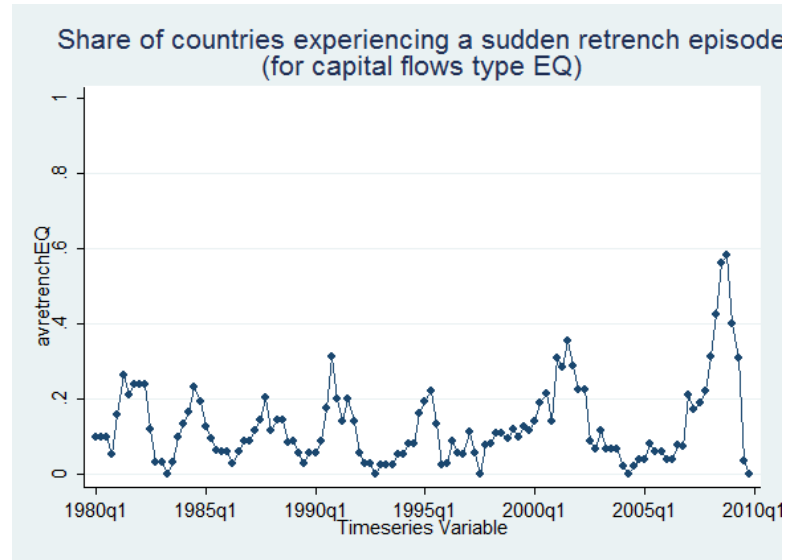**Based on Debt Flows**

Share of countries experiencing a sudden surge episode
(for capital flows type DE)

Share of countries experiencing a sudden stop episode
(for capital flows type DE)

Share of countries experiencing a sudden flight episode
(for capital flows type DE)

Share of countries experiencing a sudden retrench episode
(for capital flows type DE)
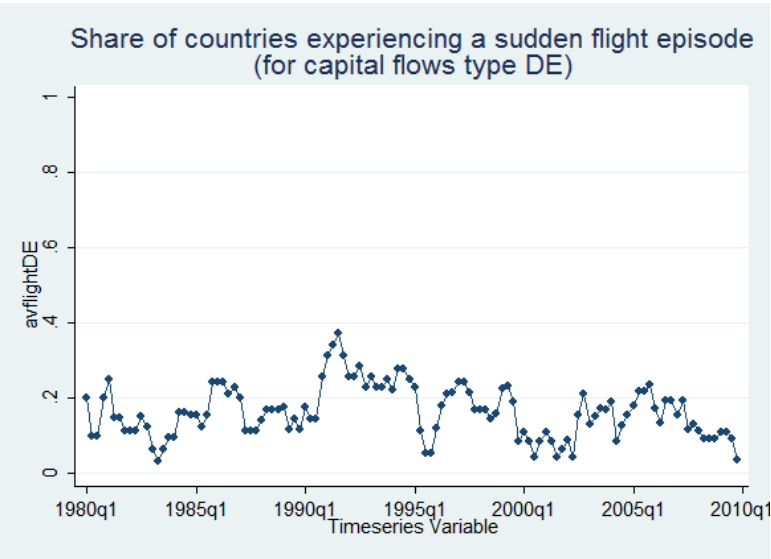
Figure 4b
Percent of Countries with Each Type of Episode:
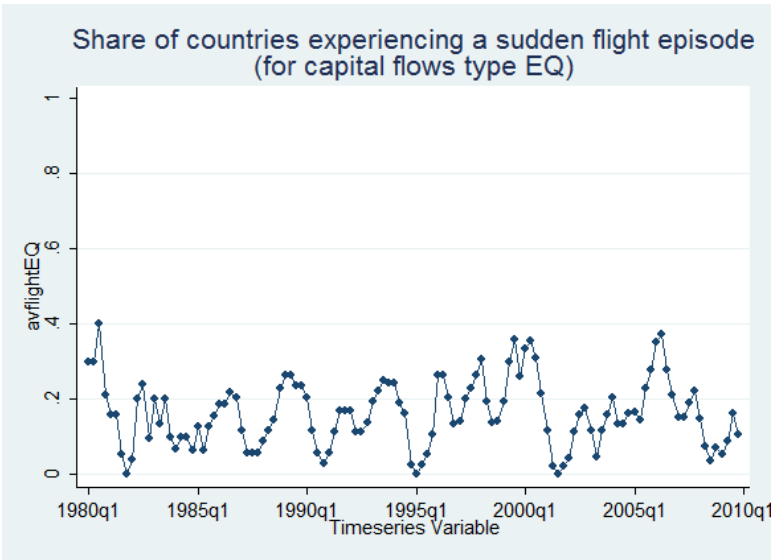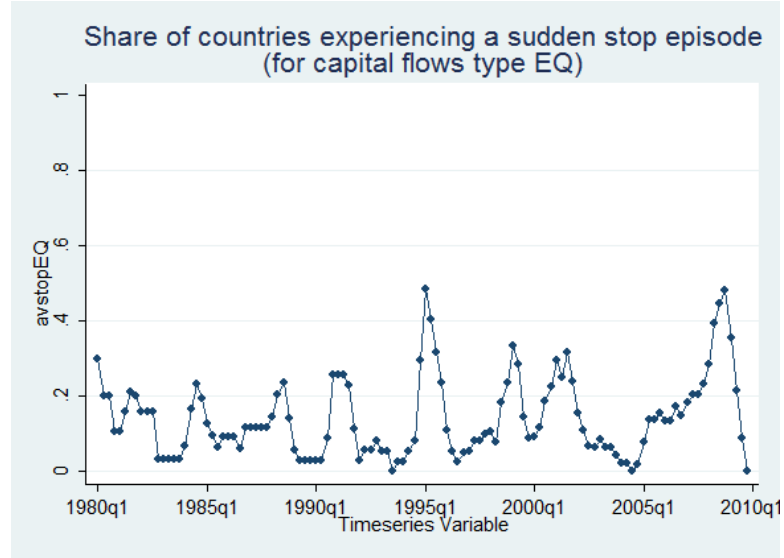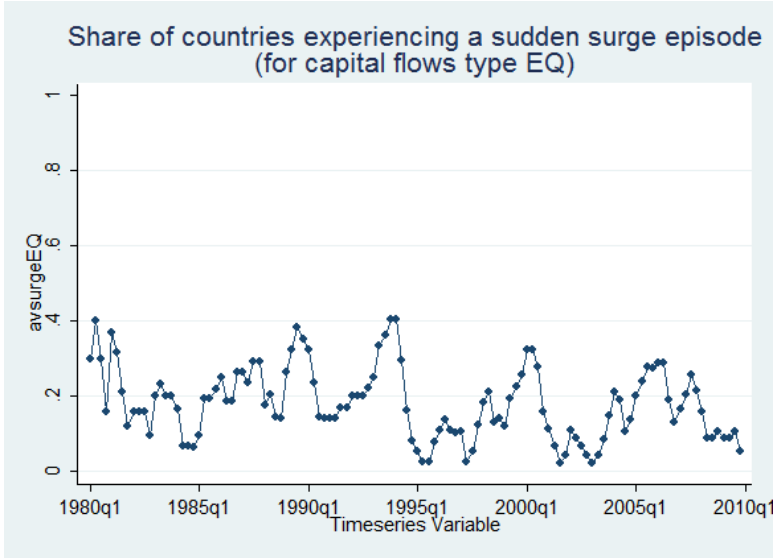**Based on Equity Flows**

Share of countries experiencing a sudden surge episode
(for capital flows type EQ)

Share of countries experiencing a sudden stop episode
(for capital flows type EQ)

Share of countries experiencing a sudden flight episode
(for capital flows type EQ)

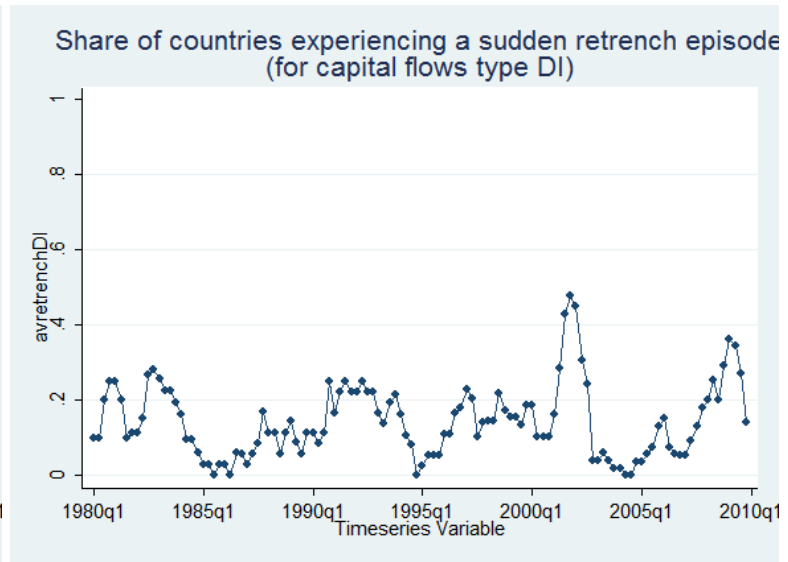Share of countries experiencing a sudden retrench episode
(for capital flows type EQ)

Figure 4c
Percent of Countries with Each Type of Episode:
Based on Direct Investment Flows

Share of countries experiencing a sudden surge episode (for capital flows type DI)

Share of countries experiencing a sudden stop episode (for capital flows type DI)

Share of countries experiencing a sudden flight episode (for capital flows type DI)

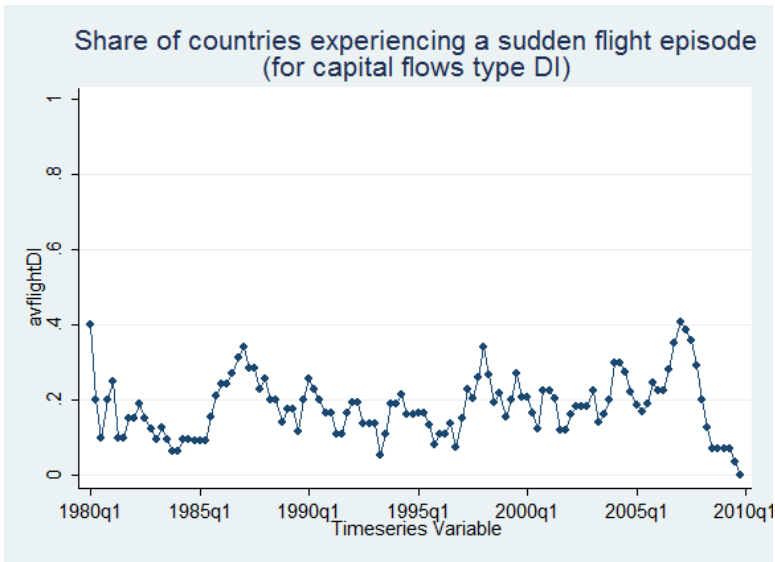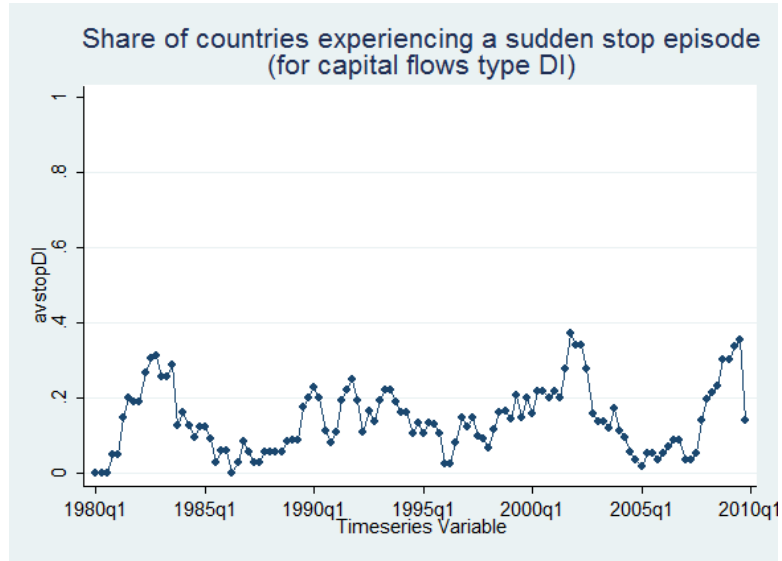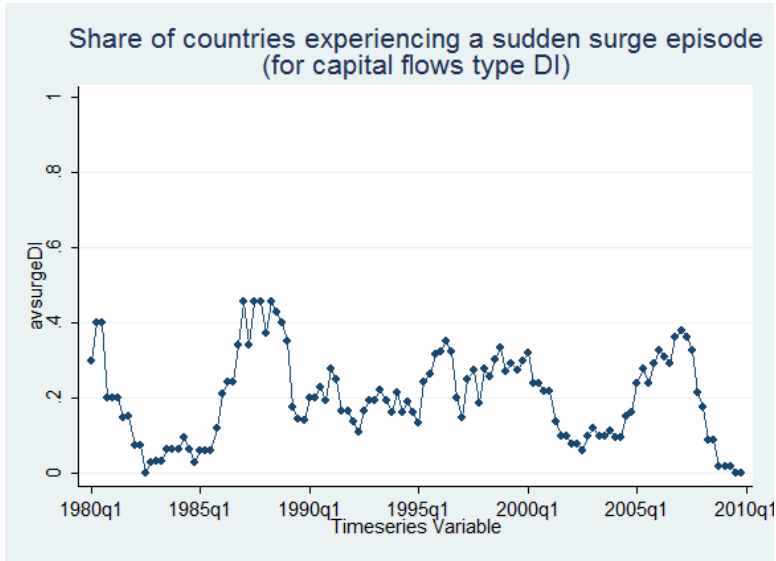Share of countries experiencing a sudden retrench episode (for capital flows type DI)

Figure 4d
Percent of Countries with Each Type of Episode:
Based on Banking Flows

Share of countries experiencing a sudden surge episode (for capital flows type BK)

Share of countries experiencing a sudden stop episode (for capital flows type BK)

Share of countries experiencing a sudden flight episode (for capital flows type BK)

Share of countries experiencing a sudden retrench episode (for capital flows type BK)

28