Sudden Flight and True Sudden Stops

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Abstract

A sudden stop is a trading phenomenon that should be framed using a trading model. But in the existing literature sudden stops are described in the context of international macro models that focus on net flows and do not differentiate between global and local investors. We allow crisis episodes to be caused by either the retreat of global investors (true sudden stops), as is assumed but not shown in the extant literature, or the sudden flight of local investors. We find that almost half of the previously defined sudden stop episodes are actually sudden flight. Compared to sudden flight, true sudden stops are bunched and are associated with greater slowdowns in economic activity and sharper currency depreciations. The empirical regularities of sudden flight and true sudden stops are consistent with the well-known Brennan and Cao (1997) model of gross capital flows and information asymmetries.

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1. Introduction

For emerging markets, international capital flows can have many benefits. For example, foreign flows can result in a reduction in systematic risk (Chari and Henry, 2004) and an increase in both physical investment (Henry 2000, 2003) and economic growth (Bekaert, Harvey, and Lundblad 2001, 2005).

These positive aspects of capital flows are tempered by the fact that capital flows—specifically, their sudden reversal—can spark crises. For example, Boyer, Kumagai, and Yuan (2006) focuses on the role of foreign investors in spreading stock market crises. More damning is the substantial literature on sudden stops (among many others, Dornbusch, Goldfajn, and Valdes (1995), Calvo (1998), and Mendoza and Smith (2006)) that places the blame for full-blown economic crises squarely on the shoulders of foreign investors. In paper after paper, sudden stops are described as crisis episodes that are caused by global investors. Edwards (2005, page 14) presents this eloquently:

“A sudden stop episode (i)s an abrupt and major reduction in capital inflows to a country that up to that time had been receiving large volumes of foreign capital.”

Many others—including Calvo, Izquierdo and Mejia (2004), Frankel and Cavallo (2004), and Mendoza (2006)—use similar terms. This description brings to mind a scenario in which global investors suddenly decide to cease providing funds to an emerging market country, for reasons that could be specific to, or possibly unrelated to, the particular country in question.
Sudden stops are not infrequent and can inflict a great deal of pain. They are often accompanied by sharp declines in the exchange rate and in economic activity, bringing much pain to the inflicted country’s residents. Moreover, an emerging market country can expect to be buffeted by a sudden stop every decade (Edwards, 2005). In the face of such frequent pain, it is no wonder that prominent academics (Rodrik, 1998; Stiglitz, 2000) are questioning the benefits of financial globalization. Emerging market policy makers, faced with such a world, cannot be faulted if they consider erecting walls around their financial systems. A natural policy response is to impede global investors’ ability to access the local markets.

But is it fair to place so much of the blame on global investors? What roles might local investors play in these crises? We tackle these questions by extending the burgeoning sudden stops literature to incorporate the actions of local investors. Capital flight is, of course, not unknown to academics and policy makers—see, among others, Dooley (1988), Khan and Ul Haque (1985), and Lessard and Williamson (1987)—but it seems to have been lost in the current surge of interest in sudden stops.1

We are not claiming that contagion—and, hence, global investors—plays no role in spreading crises. Indeed, we show some evidence supportive of a role for contagion in what we call true sudden stops. But we also show that nearly half the crises episodes established by the sudden stops literature are actually episodes of sudden flight in which those who are exiting the market are, to a large extent, local investors.

Why do traditional sudden stops papers misinterpret episodes of sudden flight? In practice sudden stops are modeled and measured using net capital flows. The descriptions one

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1 The reader who has missed this surge in interest can consult any of the 35 NBER working papers issued since January 2004 that contain ‘sudden stop(s)’ in the abstract. By contrast, over that period only 7 NBER papers contained the word ‘flight’ in the abstract, and all but one of those concerned flight-to-quality. Auguste, Dominguez, Kamil and Tesar (2006) is a recent crisis paper that focuses on the flight of locals.
reads speak to gross capital inflows, but researchers have relied on data on net capital flows to identify sudden stops episodes. Because the data are of net flows, so too are theoretical models—incorporating gross flows would be an unnecessary complication. The sudden stops literature conjures up a scene in which gross capital inflows dry up, but in practice the actions of local investors are included in the measure.

We find that a substantial portion of traditionally defined sudden stops episodes are actually sudden flight, even though we use a blunt measure that likely understates its incidence. After following the sudden stops literature to identify episodes, we define a sudden flight episode as one in which gross capital outflows increase more than gross capital inflows decrease. Using quarterly data on gross capital flows, some episodes that have been described in case studies to be flight—for example, the Frankel and Schmukler (1996) analysis of the Mexican crisis—will appear to be sudden stops. But even with our blunt measure, almost half (24) of the 55 episodes are sudden flight in which domestic investors’ flight to global capital markets exceeds the decline in global investors’ flows into the crisis country. This is not a situation in which emerging markets are cut off from global capital markets. Rather, the emerging market investors have ample access and utilize it by moving their funds abroad. We then show that, compared with sudden flight, true sudden stops are associated with more pronounced slowdowns in GDP and sharper currency depreciations. In addition, true sudden stops are bunched, which is supportive of a contagion effect, while episodes of sudden flight are more dispersed.

The extant theoretical literature on sudden stops should also be reevaluated. Most analyses of sudden stops are placed in the realm of net capital flows and utilize traditional

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2 Or maybe the causation is reversed. Traditional international macro models incorporate net flows, so there was no impetus to search beyond net flows to the gross components.

3 It is also possible that some of the investments implemented by locals actually to decisions made by global investors. For example, the Chilean episode of 1998 owes, in part, to a shift in bank deposits from Chilean to foreign banks, but there is some evidence that Spanish parent companies were behind this shift. We thank Ricardo Caballero for bringing this to our attention.
international macroeconomic models, such as real business cycle and new open economy macro models. But we live in a world of substantial two-way gross capital flows and, because sudden stop are trading phenomena, they should be framed in a trading model. The finance literature already has an appropriate model for framing sudden stops, the Brennan and Cao (1997) dynamic generalization of the multiasset noisy rational expectations model of Admati (1985). We show that after relaxing some assumptions the Brennan and Cao (1997) model, by incorporating information asymmetries and gross flows, is well-suited for framing true sudden stops in a way that allows for sudden flight. Informed locals will, at times, have superior information that foresees a negative shock to the local market. In acting on that information, they will exit their local market and shift money to global markets. Net inflows decline, but the decline is not prompted by global investors. Instead, the decline in net inflows owes to locals who exit because their superior information foresees a negative shock to the local market.

Traditional sudden stops papers lump these flight episodes together with true sudden stops.

Our study is important for at least three reasons. First, theory is progressing on the assumption that during a sudden stop the emerging market is cut off from global capital markets. Mendoza (2006) reports on dynamic stochastic general equilibrium models that can match the empirical regularities of sudden stops. In motivating his search for appropriate models, Mendoza notes that real business cycle and new open economy macro models—models that have traditionally allowed for net, not gross, capital flows—are not up to the task, in part because “just when the dominant paradigms predict that agents need capital markets the most, agents cannot borrow at all.” Caballero and Panageas (2005) predicts the likelihood of sudden stops in which emerging markets are required “at a moment’s notice…to reverse the capital inflows that
supported the preceding boom.” To the extent that theory is validated by matching its predictions to the empirical stylized facts, getting those facts correct is vital.

Second, empirical work is currently searching for preconditions that make countries more (or less) prone to sudden stops. The nascent literature on the interaction between openness and sudden stops appears, to an outsider, somewhat confusing in that it suggests that more open countries are either more susceptible to sudden stops (Calvo et al., 2004) or less susceptible (Edwards, 2005; Frankel and Cavallo, 2004) and that more open countries either have more severe crises (Edwards, 2005) or less severe ones (Edwards, 2004). If sudden flight is fundamentally different from true sudden stops, the mixing of flight and stops is contaminating the analysis of true stops.

Finally, our study is important because to the extent that theoretical and empirical work on sudden stops will morph into policy prescriptions, the proper identification of these episodes is vital. By lumping flight with stops, the extant literature increases the likelihood of recommending policies that impede global investors, when—at least in the case of flight episodes—it is local policies that must be reexamined.

The precursors to our paper include the very recent but substantial literature on sudden stops (described throughout this paper); the older literature on capital flight (mentioned above); as well as two recent papers that have focused on gross flows. Faucette, Rothenberg, and Warnock (2005) showed that a non-trivial portion of a restricted sample of Calvo et al. (2004)

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4 It must be noted that openness is defined differently in these papers. In Edwards (2005), openness is given by a new capital mobility index that is a combination of Quinn (2003), Mody and Murshid (2002), and country-specific information. While the index is designed to provide information on the extent or severity of capital controls, it is used only to place countries in buckets of low, intermediate, and high capital mobility. Analysis is based on groups, not index scores, with the middle group—which consists of roughly 140 of the 160 countries in his sample—dropped from most analysis. Edwards (2004) uses a trade-to-GDP ratio to measure openness. Frankel and Cavallo (2004) instrument for trade using gravity variables. Calvo et al. (2004) utilize the ratio of tradable to non-tradable goods to define openness.
sudden stops episodes were brought on by the flight of domestic investors, while Cowan and De Gregorio (2005) presents a very informative case study of Chilean gross flows.

The paper proceeds as follows. In the next section, we present empirical regularities of stops and flight episodes by defining empirically true sudden stops and sudden flight; describing the evolution of gross flows around both types of episodes; and characterizing stops and flight by examining the reaction of economic activity and the exchange rate during both types of episodes. In Section 3, we sketch a refocused version of the well-known Brennan and Cao (1997) model of gross capital flows and information asymmetries, which we argue is the type of model that can inform our understanding of true sudden stops and sudden flight. We conclude in Section 4.

2. The Empirical Stylized Facts

In this section we establish the stylized facts of true sudden stops and episodes of sudden flight. In a true sudden stop, net capital inflows decline because foreigners have exited the emerging market. In a sudden flight, the episode is caused by locals exiting to global markets. Both types of episodes are associated with a sharp decrease in net capital inflows, and existing work does not distinguish between these two situations.

2.1. Defining an Episode

We follow the sudden stops literature in defining crisis episodes, which we later separate into true sudden stops and sudden flight. As in Calvo et al. (2004) we first construct a monthly capital flows proxy, $P_t$, computed by subtracting monthly changes in international reserves from the quarterly current account balance, and then define $C_t$ to be a 12-month moving sum of lagged values:
\[ C_t = \sum_{i=1}^{12} P_{t-i} \quad t = 1, 2, \ldots, N \] (1)

We then compute annual changes in \( C_t \):

\[ \Delta C_t = C_t - C_{t-12} \quad t = 1, 2, \ldots, N \] (2)

As in the sudden stops literature, \( \Delta C_t \) is the focus of our indicator. The first month \( t \) that \( \Delta C_t \) falls one standard deviation below its mean is marked as the beginning of an episode.\(^5\) The episode ends once \( \Delta C_t \) again exceeds one standard deviation below its mean. In addition, within the episode, there must be at least one time \( t \) when \( \Delta C_t \) falls at least two standard deviations below its mean.

Figure 1 depicts how the standard sudden stop indicator is constructed for one country (Argentina). The solid line plots \( \Delta C_t \), with one and two standard deviations below the mean depicted by the upper and lower dashed lines. For example, in 1995 Argentina experienced a decrease in net capital inflows. The episode begins once net inflows fall one standard deviation below the historical mean, providing net capital inflows eventually fall below the two standard deviation line. In this case net inflows did continue to fall. Note that the criteria do not require flows to reverse to net outflows, just that net flows decline. The episode ends when net inflows rise above the one standard deviation line.

\(^5\) We compute rolling means and standard deviations that for month \( t \) incorporate all data from January 1987 to month \( t \). Following Calvo et al. (2004), we require 24 months of data; thus our indicators begin tracking countries in January 1989. Our last data point is December 2005.
To construct these indicators, we gather underlying data on exports, imports, and reserves from the IMF’s International Financial Statistics Database (IFS) or from Haver Analytics if IFS data are unavailable or incomplete. We search across a broad set of 28 emerging markets; our data enable us to create indicators which span the period from 1989 through 2005. We find that among these 28 countries, 70 episodes occurred over the sample period. That is, on average over the 16-year period we study, each country was inflicted by a crisis episode 2.5 times. Crises, so defined, are not infrequent.

Up to this point, our episode characterization is standard and not different in spirit from Calvo et al. (2004) or Frankel and Cavallo (2004). We next differentiate between true sudden stops and sudden flight.

2.2. Differentiating between Sudden Flight and True Sudden Stops

We break from the extant literature in our differentiation between episodes that were true sudden stops of inflows and those that owe to sudden flight. To determine whether an episode was a sudden flight or a sudden stop, we require somewhat more detailed balance of payments (BOP) data on gross capital flows.

We term an episode a sudden flight if it owed primarily to local residents sending their money abroad. Specifically, a sudden flight is one in which the increase in gross outflows from \( t_e = -3, -2, -1, 0 \) to \( t_e = 1, 2, 3, 4 \) is greater than the decrease in gross inflows over the same period. In contrast, a true sudden stop owes primarily to the actions of global investors; in a sudden stop, the decrease in gross inflows exceeds the increase in gross outflows.

Excluding episodes with missing BOP data—in 15 cases we were unable to find data on gross capital flows—leaves us with 55 episodes that occurred in 24 emerging markets. Of the 55
emerging market episodes, we found that 31 were true sudden stops while 24 were sudden flight (caused by outflows). These episodes and dates appear in Table 1. Many episodes that were previously blamed on global investors are actually sudden flight. On average, over our 16-year sample period, each country was inflicted by a true sudden stop 1.3 times and was inflicted by the flight of its residents once. True sudden stops are much less frequent than portrayed in the literature.

Our method is not perfect and likely understates the proportion of episodes that were triggered by sudden flight. Some episodes that have been shown using case studies to have been prompted by the flight of locals appear as sudden stops using blunt quarterly BOP data on gross flows. An example is the 1994 Mexican Peso Crisis, which was shown by Frankel and Schmukler (1996) to be triggered by the flight of local investors. However, it is a sudden stop using our coding technique because the sheer size of the retrenchment by foreigners (once they took the signal from the locals) far exceeded the magnitude of local flight. A more recent example is the flight from Argentina in 2001 (Auguste et al. 2006), which is also a sudden stop using our methodology. Case studies will always be able to drill down more deeply into any single episode.

2.3. Characteristics of Sudden Flight and True Sudden Stops

Figure 2 depicts the evolution of gross capital inflows for all episodes, true sudden stops, and episodes of sudden flight. Panel A highlights that across traditionally defined episodes, gross financial inflows fall sharply, but they rebound very quickly.6 This quick resumption of inflows is clearly not what the sudden stops literature is built on—even the strongest countries can face a

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6 To be included in a figure an episode must have complete data for the entire sample depicted. For example, in Figure 2, we have only 47 episodes because inclusion requires 8 quarters of gross flows data before and after the beginning of an episode.
one-quarter pause in gross inflows. For true sudden stops (Panel B), as the literature suggests, gross inflows drop off considerably. In contrast to Panel A, during true sudden stops inflows stay modest for a full year; this is the painful period during which the emerging market economy is starved for capital but receives none. Episodes of sudden flight (Panel C) are also characterized by a slowdown in inflows, but here the slowdown is only temporary and is followed by very strong inflows for the next two years.⁷

Figure 3 provides another compelling view of the distinction between flight and stops. The figure shows the evolution of U.S. investors’ positions in the inflicted countries’ stocks and bonds, as well as these countries’ positions in U.S. equities and bonds. The graphs on the left side of Figure 4 show that U.S. investors increase their positions in emerging market securities during a sudden flight episode (dashed line); both bond and equity positions increase, equity positions substantially so. In contrast, during a sudden stop (solid line), U.S. investors decrease their positions, first in equities but later also in bonds. The left side of the figure implies that during sudden flight episodes emerging market investors have access to global markets, as U.S. investment is increasing during these episodes. It is only during true sudden stops that access is reduced. The graphs on the right side of Figure 3 show the actions of local investors during these episodes. Based on these graphs, it appears that local investors increase their positions in U.S. equities two quarters before a sudden flight episode and move into U.S. bonds a few quarter into the episode (and a year before, as well).

We next attempt to ascertain whether the severity of macroeconomic and currency effects differs across episodes of sudden flight and sudden stops. To determine if there are substantial

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⁷ Sudden flight episodes are counted as episodes in the existing literature because the temporary slowdown in inflows is accompanied by a surge in outflows. This surge in outflows is enough to bring net inflows far enough below their historical average. The strong resumption in gross inflows during sudden flight suggests that the substantial rebound in inflows depicted in Panel A owes to the contamination of true sudden stops with sudden flight. Figure 2 is compiled using means; the contours of gross inflows are very similar if we use medians (not shown).
differences between stops and flight, we examine the performance of real GDP, its components, and the currency before, during, and after each episode.

True sudden stops are accompanied by larger slowdowns in overall GDP as well as consumption and investment (Figure 4). For example, in the four quarters following the onset of a true sudden stop, GDP growth slows to near zero, whereas the slowdown during sudden flight is modest. For stops, the slowdown owes to declines in consumption and investment that are not offset by the surge in net exports. The figure does not portray the considerable variation within each type of episode, but graphs using medians (not shown) are similar and, at the 10% level, growth in GDP, consumption, and imports is significantly lower in stops than in flight episodes.

True sudden stops are also accompanied by a sharp depreciation of the nominal exchange rate (Figure 5). Movements in real exchange rates (not shown) are very similar because changes in relative inflation rates are minimal. In contrast, while depreciations are slightly larger leading into a sudden flight episode, at the onset of sudden flight the currency depreciation is quite muted. Most of the dramatic change in the exchange rate owes to two countries (Argentina and Brazil); median changes are more muted and the difference between stops and flight is not significant at the 10% level.

Figures 4 and 5 are not unrelated: To the extent that emerging markets have difficulties borrowing in their local currency (Eichengreen and Luengnaruemitchai, 2004; Burger and Warnock 2006a, 2006b), the depreciation has immediate balance sheet effects that will adversely impact economic activity (Calvo et al., 2004; Mendoza and Smith, 2006).⁸

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⁸ Recently, many researchers in the sudden stops literature have followed the lead of Calvo et al. (2004) and begun to impose the additional ad hoc requirement that the episode must be painful, where ‘pain’ is defined as an absolute drop in GDP during the sudden stop episode. Our work suggests that true sudden stops are painful, so there is no need to impose pain in an ad hoc way.
Finally, Figure 6 plots the time-bunching of sudden stops episodes by the type of episode. True sudden stops are bunched from 1997 through 2001. In contrast, sudden flight episodes appear to be isolated across time. These charts are suggestive of a world in which true sudden stops have an important common component—and that perhaps contagion is an apt descriptor—whereas sudden flight episodes are driven primarily by local conditions.

3. A Model of Flight and Stops

The established literature on sudden stops utilizes various international macro models, from real business cycle to new open economy macro to debt-deflation models; see Mendoza (2006) for a useful summary. However, we believe that the new stylized facts suggest that these crisis episodes are best thought of in the context of the canonical model of gross flows and information asymmetries: the Brennan and Cao (1997) dynamic generalization of the multiasset noisy rational expectations model of Admati (1985). In this section we present a sketch of that model with a slight re-emphasis and slightly different assumptions. But do not misunderstand us: The model is Brennan and Cao’s. We are merely showing how it can be applied to inform our understanding of sudden stops and sudden flight.9

In the model, country of residence matters. There are $M$ risky assets, each of which can be thought of as being a country’s equity index. Each risky asset has a terminal payoff realized at time 1 given by an $M \times 1$ normally distributed random vector $\tilde{U}$ that has mean $\bar{U}$ and precision matrix $H$. Everyone has access to a riskless interest rate of zero. An investor in country $i$, $i \in [0,1]$, is endowed at time 0 with quantities of the risky assets given by vector $X^i$; investors have exponential utility functions defined over time 1 terminal consumption with common

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9 The focus of Brennan and Cao (1997) was not on sudden stops but rather on the returns-chasing behavior of U.S. investors. For more recent evidence on that topic, see Thomas, Warnock, and Wongswan (2006) and Albuquerque, Bauer, and Schneider (2006).
CARA of \(1/r\). The vector of aggregate per capita supply of the risky assets, \(\tilde{X}_0\), is normally and independently distributed with mean \(\bar{X}_0\) and precision matrix \(\Phi_0\). \(T\) trading sessions held at times \(\tau_t = t/T, \quad t=0, \ldots, T-1\), and at time 1 asset payoffs are realized and consumption takes place.

Prior to trading session \(t\), each investor \(i\) gets an \(M \times 1\) vector of private signals \(\tilde{Z}_i^t\) about the asset payoffs:

\[
\tilde{Z}_i^t = \tilde{U} + \tilde{\varepsilon}_i^t \tag{3}
\]

where \(\tilde{\varepsilon}_i^t\) is distributed normally and independently of \(\tilde{U}\), has mean zero, and is independent of \(\tilde{\varepsilon}_j^k\) if \(k \neq i\) or \(j \neq t\). The precision matrix of private signals received by investor \(i\) just before session \(t\) is denoted by \(S_i^t\).

Prior to trading session \(t=0, \ldots, T-1\) each investor \(i\) gets an \(M \times 1\) vector of public signals \(\tilde{Y}_t\) about the asset payoffs:

\[
\tilde{Y}_t = \tilde{U} + \tilde{\eta}_t \tag{4}
\]

where \(\tilde{\eta}_t\) is distributed normally with mean zero and precision matrix \(N_t\). It is assumed that \(N_0 = N_T = 0\), where 0 is the zero matrix. There is no public information at time 0 (\(\tilde{Y}_0 = 0\)) and all risky asset returns are realized at session \(T\).

New liquidity traders enter the market in each trading session \(t=1, \ldots, T-1\). The incremental net supply of liquidity traders is given by the normally distributed random
vectors, $\tilde{X}_t$, which have means $\bar{X}_t$ and precision matrices $\Phi_t$. Impose $\bar{X}_t = 0$ for $t > 0$, and assume that the total trading volume is not observable by traders (to preserve the less than fully revealing nature of the rational expectations equilibrium).

Letting $\tilde{P}_t$ denote the vector of equilibrium risky asset prices and $\tilde{D}^i_t$ denote the vector of risky asset demands for investor $i$ in trading session $t$, then solution techniques of Admati (1985) and Brennan and Cao (1997) can be used to show that the optimal trading strategy of investor $i$ is

$$
\Delta \tilde{D}^i_t = \tilde{D}^i_t - \tilde{D}^i_{t-1} = r \left[ S^i_t (\tilde{Z}^i_t - \tilde{P}_t) - S^i_t (\tilde{U} - \tilde{P}_t) + \frac{\tilde{X}_t}{r} - \sum_{j=0}^{t-1} (S^j_t - S^j) \Delta \tilde{P}_t \right]
$$

That is, investor $i$’s trading strategy depends on

a) $S^i_t (\tilde{Z}^i_t - \tilde{P}_t)$: The difference between his vector of private signals in period $t$ and the vector of prices, weighted by his private signal precision matrix;

b) $- S^i_t (\tilde{U} - \tilde{P}_t)$: The difference between the vector of the average private signal and the vector of prices, weighted by the average private signal precision matrix;

c) the vector of supply shocks due to new liquidity trades; and

d) $- \sum_{j=0}^{t-1} (S^j_t - S^j) \Delta \tilde{P}_t$ : the vector of price changes, weighted by the difference between the investor’s private signal precision matrix and the market average precision matrix (accumulated for all sessions up to session $t-1$).

Points (a) and (b) together yield $S^i_t (\tilde{Z}^i_t - \tilde{P}_t) - S^i_t (\tilde{U} - \tilde{P}_t)$, which shows that investor $i$ will buy in markets for which he receives a private signal that is stronger than the average investors’
private signal (as long as his signal is sufficiently precise). Point (d) shows that investors will follow momentum strategies in countries in which they have a cumulative information disadvantage; if \( S'_j < S_j \) then investor \( i \) will chase price movements, buying when prices increase and selling when prices decline.

To focus on the returns-chasing component (point d), Brennan and Cao (1997) imposed that information endowments are symmetric. The symmetry assumption imposed that the elements of an investor’s precision matrix do not differ across foreign markets (and can be zero); with this assumption, trades are a function only of market returns. For our purposes, we prefer to allow for a role for (a) and (b) and thus allow for asymmetric information across foreign markets.

We next focus on the implications of the model for a particular emerging market \( e \) and a country \( g \) with global investors. Consider first the trades of global investors in the emerging market. Abstracting from liquidity trades, the global investor’s trading in the emerging market’s assets will be governed by the Information Trade and Returns-Chasing. The Information Trade in this case is given by

\[
S_{e,t} (\tilde{Z}_{e,t} - \tilde{P}_{e,t}) - S_{e,t} (\tilde{U}_{e,t} - \tilde{P}_{e,t})
\]  

(6)

Thus, the global investor will buy emerging market assets if he receives a stronger than average positive signal about \( e \). Note that this positive \( e \) signal can owe to information about strong fundamentals in \( e \), or it could be due to a strong, precise negative signal about \( g \). It could also, as suggested by Albuquerque et al. (2006), originate from information about the likely actions of other \( g \)-type investors. We can call this information about other \( g \)-type investors a global private signal; the investment business is sufficiently global that it is not unlikely that
funds in America are aware of the likely actions of U.K.-based funds. Conversely, global investors will sell emerging market assets if they receive negative news about the emerging market or relatively positive news about other markets. Moreover they will also sell emerging market assets if they receive a global private signal that other g-type investors will sell.

If locals have a cumulative information advantage, also at work is Returns-Chasing:

\[- \sum_{j=0}^{t-1} (S_{e,j}^g - S_{e,j}) \Delta \tilde{P}_{e,t} \]

With returns chasing, if \( g \) has a cumulative information disadvantage in \( e \), then he will buy \( e \) on price increases (thinking that someone must have strongly positive private information on \( e \)) and sell \( e \) on price declines.

Similar expressions can be written down for emerging market investors’ trades in global markets. For instance, an investor from an emerging market will move into global markets when he receives a negative signal about his home market. Which effect dominates—Information Trade or Returns Chasing—depends on the relative magnitudes of the marginal and cumulative information (dis)advantages. For their particular focus, Brennan and Cao (1997) assumes the cumulative (dis)advantage dominates, but we do not require such an assumption.

The canonical Brennan and Cao (1997) model predicts that emerging markets are not always culpable for sharp declines in net inflows. Errors in local public and global private signals result in too many inflows when positive and too many outflows when negative. If informed global investors receive a negative global signal, we expect to see outflows from emerging markets that are not associated with local fundamentals. But there are also times during which
the locals are behind the outflows. When locals receive a negative local private signal, they head for global markets, selling to foreigners on their way out.

In terms of the sudden stops language, true sudden stops can be caused (i) by global investors recoiling from all markets because of a negative (private) signal about global markets, or (ii) by global investors misinterpreting and overreacting to a perceived negative (public) signal about an emerging market. Sudden flight, in contrast, owes to locals exiting their markets because of a negative (private) signal about the local economy. Another implication is that, relative to episodes of sudden flight, sudden stops should be bunched in time across countries (as Figure 6 showed).

In summary, the Brennan and Cao (1997) model of information asymmetries and gross flows is consistent with the new stylized facts of sudden stops and sudden flight. As such, it is a useful alternative to the classes of models currently used to analyze sudden stops. Sudden stops are trading phenomena that should be framed in a trading model.

4. Conclusion

Episodes of sudden flight—ignored in the resurgent literature on emerging market crises—can owe to the rational trades of locals who have superior information about upcoming negative news about the local (emerging) market. Empirically, many emerging market crises that were previously categorized as sudden stops of capital inflows are actually sudden flight episodes in which locals exit to global markets. The two types of episodes differ in important ways, with true sudden stops being accompanied by substantially more pain in the form of sharper declines in economic activity and the currency. By distinguishing between flight and stops, future work can provide a better understanding of the conditions that lead to each type of
infliction. Moreover, for those interested only in the type of episode caused by the actions of global investors—true sudden stops—removing sudden flight episodes from their analysis should lead to sharper empirical results and, hence, better informed policy prescriptions.
References


Table 1. Descriptive Statistics of Sudden Stop Episodes

The table shows for all episodes the dates, the change in gross outflows and gross inflows for the one year leading up to and following the onset of the episodes, and whether the episodes is a true sudden stop or sudden flight.

<table>
<thead>
<tr>
<th>Timing of Episode</th>
<th>Start Date</th>
<th>End Date</th>
<th>Change in Gross Capital Flows from $t_e = -3, -2, -1, 0$ to $t_e = 1, 2, 3, 4$</th>
<th>True Sudden Stop?</th>
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<td></td>
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Figure 1. Indicator Construction
The figure shows the traditional construction of a sudden stops indicator for Argentina. Shaded areas are episodes, which begin when the capital flows proxy (the solid line) drops one standard deviation below its historical mean (the upper dashed line), provided the proxy eventually falls two standard deviations below its mean (the lower dashed line). The episode ends when the proxy again crosses the one standard deviation line.
Figure 2. Gross Inflows During All Episodes, True Sudden Stops, and Sudden Flight
The figures depict mean gross inflows during 47 episodes (27 true sudden stops and 20 sudden flight). Event time is in quarters, with zero being the beginning of the episode.

(a) All Episodes

(b) True Sudden Stops
(c) Sudden Flight
Figure 3. Evolution of Bilateral Positions in Equities and Bonds
The figures depict mean quarterly changes in U.S. positions in inflicted countries and those countries’ positions in U.S. securities during 27 true sudden stops (solid lines) and 20 sudden flight episodes (dashed lines). Bilateral positions data are constructed as in Thomas, Warnock, and Wongswan (2006).
Figure 4. Evolution of GDP and its Components
The figures depict mean year-over-year changes in real GDP and its components during 24 true sudden stops (solid lines) and 13 sudden flight episodes (dashed lines). Data availability limits the sample sizes in the components graphs; the smallest samples are for consumption (22 stops and 6 flight).
Figure 5. Evolution of Exchange Rate
The figure depicts mean quarterly changes in the nominal exchange rate, defined as local currency per U.S. dollar (up is depreciation), during 30 sudden stops (solid line) and 24 sudden flight episodes (dashed line).
Figure 6. Time Bunching of Episodes
The figures depict the number of episodes in each month from January 1989 through December 2005.

Time Bunching of Sudden Stops Episodes

Time Bunching of Sudden Flight Episodes