PABLO E. GUIDOTTI
FEDERICO STURZENEGGER
AGUSTÍN VILLAR

On the Consequences of Sudden Stops

> Money . . . has oppressed nearly all people in one of two ways: either it has been abundant and very unreliable, or reliable and very scarce.
>
> John Kenneth Galbraith, *The Age of Uncertainty*

Sudden stops in capital flows—and the ensuing current account reversals they induce—have been at the center of economic policy discussions since the outbreak in the mid-1990s of the series of financial crises that plagued emerging market economies. Sudden stops spared no region and have been particularly prevalent in both Asia and Latin America.

As a result of these crises, policymakers and researchers alike directed their attention toward identifying the causes and designing policies to prevent crises.[1] In fact, policy circles placed substantial effort in the development of a system of early warning signals, under the presumption that some key country fundamentals would be sufficient for identifying future crises.[2]

The reality of capital market behavior soon showed, however, that a number of institutional and regulatory factors might easily spur contagion across seemingly unconnected economies, often with little relation to the

Guidotti and Sturzenegger are with the Universidad Torcuato di Tella. Villar is with the Bank for International Settlements: The opinions expressed are those of the author and not necessarily those of the Bank for International Settlements.

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1. Eichengreen and Rose (1999) provide a survey of the discussion.

2. IMF (1998) provides an example from the international financial community; Ades, Masi, and Tenengauzer (1998) from the perspective of financial markets; and Frankel and Rose (1996) and Glick and Rose (1998) from the academic community.

quality of domestic policies.[3] Chile, a model of macroeconomic prudence, suffered a massive sudden stop in the aftermath of the Russian crisis, and even high income economies such as Portugal and Spain were unable to avoid a sudden stop in the wake of the collapse of the European Monetary System earlier in the decade.

If sudden stops are to become a permanent feature of the landscape facing emerging market economies, equal emphasis should be placed on understanding how a sudden stop affects an economy and how the costs of such an event can be minimized. Casual evidence suggests that countries may experience large discrepancies in the aftermath of a sudden stop. For example, a comparison of Asian and Latin American countries, such as we make in this paper, shows that the former tend to adjust to a sudden stop via fast export growth; as a result, Asian recessions have been short-lived and recoveries swift. In contrast, adjustment in Latin American economies has occurred via import and demand contraction, while exports have remained stagnant even in the wake of significant exchange rate devaluations. Latin American recessions have thus been protracted relative to the Asian experience.

A number of relevant questions emerge from these observations. How frequently are economies likely to be exposed to sudden stops in capital flows? Why does an economy adjust to a sudden stop in capital flows via export growth or import contraction? How does this translate into gross domestic product (GDP) growth or investment decisions? What causes this different behavior? What are the implications and policy lessons? Such questions constitute the focus of this paper.

A large body of literature focuses on understanding the reasons for a sudden stop or designing appropriate prevention measures to avoid such events.[4] Much less work aims at identifying the characteristics that may determine a less painful aftermath to the crisis, yet understanding whether the adjustment comes through output and export growth or through domestic absorption contraction has important policy implications.

An analogy may help illustrate the objective of our exercise. Airbags are not useful for preventing accidents, but they help reduce the costs associated with them. In this paper we are not concerned with the question of

3. See, for instance, Calvo (2002) and Calvo and Mendoza (2000) on contagion; see Guidotti (1999, 2003) on crisis prevention.

4. Examples of the former approach include Eichengreen, Rose, and Wyplosz (1995b, 1996); on the latter, see the extensive review in Edwards and Frankel (2003).

how an economy comes to suffer from a sudden stop (the accident), but with assessing what sort of airbags might minimize the damage. In other words, we look at what characteristics of an economy might make a sudden stop less painful.

Recent empirical literature on crises in emerging markets addresses a number of related phenomena, and many papers provide precise definitions that allow analysts to separate these phenomena into different events with different causes and consequences. Currency crises refer to the demise of an unsustainable peg. Large depreciations refer to significant realignments in nominal and real exchange rates. Speculative attacks are measured as combinations of exchange rate, interest rate, and reserve changes, which result in market pressures on government policies. Current account reversals refer to large swings in the current account, banking crises to massive failures in the financial system, and sudden stops to large declines in capital flows.

Most of these concepts are related. More likely than not, a sudden stop will come together with a current account adjustment (for example, if there is a floating exchange rate regime with no intervention from monetary authorities or international financial institutions). Current account adjustments may come together with large real exchange rate adjustments, and banking and currency crises seem to coincide, a phenomenon that has been dubbed the twin crises.[5]

Simultaneity is not guaranteed, however. For example, Milesi-Ferretti and Razin study the relation between currency crises and current account reversals.[6] They conclude that currency crises have a tenuous relation with current account reversals: less than one-third of all current account reversals were preceded by a currency crisis. Thus, according to Milesi-Ferretti and Razin, current account reversals are a much broader phenomenon than currency crises.

The recent empirical literature moves from the analysis of currency crises and speculative attacks to the study of sudden stops. Sudden stops have different origins. They sometimes result from large domestic shocks such as wars, political turmoil, and banking or currency crises. They can also stem from external conditions such as changes in international interest rates, violent swings in the risk appetite of financial markets, or

5. See Kaminsky and Reinhart (1999).
6. Milesi-Ferretti and Razin (1998, 2000).

contagion. In other cases, large changes in capital flows may be completely unrelated to either domestic or external fundamentals, arising simply from the movement between several, equally feasible, multiple equilibriums.

Although some analysts address the determinants of sudden stops, their implications have been explored systematically in the theoretical literature only relatively recently. This is somewhat surprising, considering that sudden stops typically have a large effect on the economy.[7] Calvo describes this phenomenon very clearly:

> One key aspect of recent financial crises affecting emerging economies is that they have been accompanied by a major cutback in capital inflows. In Thailand, for example, these flows were cut by an amount equivalent to 26 percent of its gross domestic product during 1997. To adjust to these interruptions, countries have been forced to liquidate their international reserves and reduce their current account deficit. It is this last step that causes the most harm to the economy, as to do so these countries must lower aggregate demand, that is to say, their total spending. In practice the amounts involved have been substantial and have consequently resulted in sharp falls in output and employment. This phenomenon, known as the Sudden Stop, is not experienced by developed countries, where the crises have been much less severe and in many cases have been accompanied by an expansion of credit, rather than strong contraction as in the case of the emerging economies.[8]

Calvo's characterization of sudden stops in capital flows to emerging market economies integrates the traditional characterization of current account behavior with the concept of financial crises.[9] Conventional international finance theory stresses the role of intertemporal factors in determining current account adjustments. According to this view, in the simplest one-good specification, the current account improves (worsens) when income temporarily increases (falls) or when income is expected to fall (increase) to a new steady-state level. This conventional view thus holds that changes in the current account reflect the desire to smooth income shocks, but it requires an implicit assumption that capital flows are effectively available to fulfill that role.

7. According to Calvo (1998), the expression *sudden stop* was inspired by a bankers' adage that "it is not speed that kills; it is the sudden stop," quoted in Dornbusch, Goldfajn, and Valdés (1995).

8. Calvo (2001).

9. Calvo (1998, 2001).

However, a key implication of the sudden stop literature is precisely the need for aggregate spending to adjust suboptimally on the curtailment of available capital inflows. In this scenario, current account adjustments are not optimal in the sense of the traditional literature, but rather represent the response to a liquidity constraint that suddenly (though not necessarily unexpectedly) befalls a given country. If the economy cannot use its own reserves or obtain aid or assistance from international financial institutions, then the issue is not whether a sudden stop or a financial crisis would cause an adjustment, but by how much and with what consequences. This paper explores empirically how preconditions and policy measures bear on those consequences.

Closest to our exercise is the contribution of several authors who study the aftermaths of balance-of-payments or currency crises, as well as a literature that looks at the implications of current account reversals. The first group includes Eichengreen, Rose, and Wyplosz; Glick and Hutchison; Kaminsky and Reinhart; and de Gregorio and Lee.[10] Most of these authors find sizable effects of currency crises on output. Among the second group, Edwards argues that current account reversals are associated with sizable reductions in investment and growth performance; this contrasts with earlier results by Milesi-Ferretti and Razin, who find no significant effect between reversals and growth.[11] More recently, Edwards analyzes the effect of current account reversals on GDP growth, exploring whether openness, foreign debt, and the exchange rate regime condition the aftermath of such experiences.[12] Our exercise is closest in spirit to this last work, although we use a different methodology and data set.[13]

Traditional studies focus on relatively long-lasting effects, usually concentrating on two- to three-year changes and filtering out changes that proved to be temporary. The focus of this paper, however, is on the effects of sudden stops, so we are interested in abrupt and sharp reductions in the availability of foreign resources. We thus center on countries that have to adjust the current account quickly in order to accommodate themselves to the available external financing, rather than choosing the

10. Eichengreen, Rose, and Wyplosz (1995a); Glick and Hutchison (2001); Kaminsky and Reinhart (1999); De Gregorio and Lee (2003).

11. Edwards (2002); Milesi-Ferretti and Razin (2000).

12. Edwards (2003).

13. For an analysis of current account reversals among member countries of the Organization for Economic Cooperation and Development (OECD), see Freund (2000).

level of borrowing or lending required to maximize intertemporal utility. Unexpectedly, this short-term definition of a sudden stop reveals that it is a very frequent phenomenon around the globe, which confirms our earlier conjecture that sudden stops and the ensuing adjustment constitute a permanent feature of the world economy.

Our analysis shows a number of interesting empirical regularities. First, when we apply a simple definition of sudden stops, we find that they have been a fairly common occurrence at least since the late 1970s. Second, economic performance after a sudden stop can differ dramatically across countries, depending on certain country characteristics. We show that open economies and those that choose a floating exchange rate regime after a crisis recover fairly quickly from the output contraction that usually comes with the sudden stop, whereas countries with liability dollarization recover more slowly. These characteristics relate to how the economies adjust exports and imports during the aftermath of a sudden stop. Open economies that do not show much liability dollarization tend to show higher export growth and less import contraction than highly dollarized economies.

The paper is organized as follows. The next section discusses our definition of sudden stops. We then examine the stylized facts associated with sudden stops, including their regional coverage and evolution over time. A subsequent section proceeds to identify the key factors that explain the nature of the aftermath of a sudden stop in capital flows. If sudden stops remain a recurrent feature of emerging market economies in years to come, the issue of how to ensure a quick return of growth in the aftermath of a crisis will require attention. Policy recommendations focused on improving such ex post performance should go hand in hand with traditional prevention measures designed to avoid the crises. We elaborate on these conclusions in the final section.

Defining the Episodes

To start our analysis we need a definition of what we consider a sudden stop (henceforth also called an episode). The literature offers two possible methodologies for defining when a country faces such an event: a case study approach or the use of purely statistical criteria. The case study approach uses a priori information on what analysts or experts consider

crisis experiences.[14] However, choosing an episode on the basis of perceptions has two major drawbacks. First, it is difficult to be sure that no crises are left out, which is problematic if the objective is to obtain empirics that are as comprehensive as possible. Second, choosing crises that are identifiable ex post may lead to the selection of only episodes that are relevant ex post, biasing the sample toward finding significant effects. As a result of these drawbacks, we are inclined toward a purely statistical procedure for identifying crises. The application of a standard and simple criterion to define a sudden stop uncovers a large number of previously unsuspected cases.

We take as our starting point Calvo, Izquierdo, and Mejía's definition of a sudden stop, which they identify as occurring when capital flows to a country contain a year-on-year contraction of the capital account two standard deviations below its sample mean.[15] In those cases, they assume that the sudden stop begins when the annual change in capital flows falls one standard deviation below the mean and ends when the annual change is less than one standard deviation below the mean. They further restrict the cases to those in which capital outflows are accompanied by a contraction in output.

We deviate from this definition slightly. Because we are concerned with sudden changes and the reaction they elicit, we look at countries that display capital account contractions larger than one standard deviation below their sample mean (the starting threshold in Calvo, Izquierdo, and Mejía's definition). We restrict the sample, however, to those cases in which the capital account contraction exceeds 5 percent of GDP to avoid including countries that display minimal changes in the capital account which are larger than one standard deviation owing to the countries' low volatility. Additionally, we do not restrict the cases to those in which output falls. Imposing the output restriction may bias the sample toward poor adjusters, whereas we are interested in how countries may successfully respond to the sudden stop.[16]

14. Calvo and Reinhart (2000, 2002), for example, use this approach.

15. Calvo, Izquierdo, and Mejía (2003).

16. In a previous version of this paper, we check the stability of our results by running the specification based on a definition of a sudden stop as any contraction in capital flows larger than 5 percentage points of GDP. The results are virtually identical, so we have dropped this robustness check in this version.

Once we identify the sudden stops, we split the sample in two, distinguishing between those countries where the sudden stop led to an adjustment of the current account and those in which such an adjustment did not happen (probably because reserve depletion was used. We do this by looking at the improvement of the current account in the aftermath of the shock. Countries in the former group combine the presence of the sudden stop with at least some improvement in the current account. We choose as a threshold, somewhat arbitrarily, an improvement in the current account of more than 2 percentage points of GDP during the year of the sudden stop, the following year, or those two years combined.[17] The use of yearly data is justified to obtain as large a database as possible.[18]

We refer to sudden stops that do not lead to a current account reversal as sudden stops that do not require a domestic adjustment. This terminology emphasizes the fact that the use of reserves allows the country to avoid, at least in the short term, the need for a current account adjustment and, therefore, the need to adjust the exchange rate or to contract output. Of course, many of these apparently avoided adjustments lead to a larger adjustment further down the road, but as we are interested in the short-run response of the economy, we think it is appropriate to consider these as a separate group, at least in the short run.

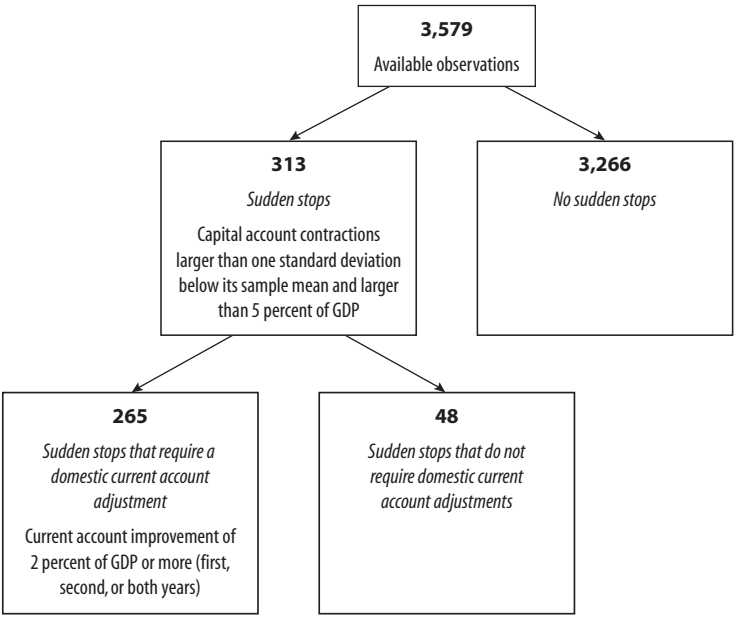
A word of caution is in order. A contraction in capital flows may be the endogenous (and optimal) response to a large, unexpected, and positive transitory wealth shock.[19] It is thus necessary to check the robustness of the results when filtering out those cases in which these wealth shocks may

17. We tried alternative computations with different cutoff points to check the robustness of the results.

18. This definition differs from that used by Milesi-Ferretti and Razin (1998) to define a current account reversal. They require that countries show a reduction in the current account deficit of 3 (5) percentage points over a period of three years with respect to the three years before the event, that the maximum deficit after the reversal be no larger than the minimum deficit in the three years preceding the reversal, and that the average current account deficit be reduced by at least one third. This attempts to capture large and sustained improvements.

19. The relation between the current account and wealth shocks is complex. Permanent increases will have only a minimal effect on the current account. In some cases, permanent shocks may feed into the investment process, deteriorating the (optimal) current account in the short run. It is reasonable to assume, however, that large wealth shocks may initially be considered as transitory and thus lead to an improvement in the current account and an endogenous fall in capital flows.

FIGURE 1. Types of Sudden Stops



have occurred. We perform a robustness check by eliminating countries that experienced substantial positive terms-of-trade shocks.

In summary, we define a sudden stop as occurring in countries that show a contraction in aggregate capital flows larger than one historical standard deviation in those flows and larger than 5 percent of GDP. We apply this classification procedure to a database including all countries in the world for which data are available since 1974. While the potential number of data points is 4,771, capital account data are available for only 3,579 country-year observations. Of those observations, 313 satisfy our sudden stop definition.

Our second filter requires sorting through these 313 episodes to identify those that show an improvement in the current account, as defined above. We find 265 such cases. We refer to these as sudden stops that required a domestic adjustment. The remaining forty-eight cases represent sudden stops that did not require a domestic adjustment. As can be immediately concluded, sudden stops most likely lead to current account adjustments. Figure 1 illustrates the classification procedure.

Stylized Facts on Sudden Stops

The classification identifies 313 episodes of sudden stops. Tables 1 and 2 show examples for both types of sudden stops to provide a sense of the countries that are being considered. Within each group, we show the largest fifteen episodes, classified both by the size of the capital account reversal and by country size. For the larger group of cases, in which a current account adjustment was required, we also show the most important episodes for Latin America and East Asia, classified by country size (table 3).

When the sudden stops that did not require an adjustment of the current account are ordered by the size of the capital account shock, we find a very diverse set of countries, including not only small, poor countries, but also European and middle-sized emerging economies. These shocks were dealt through a depletion of foreign reserves. When the sample is ordered by country size, we find many European countries, and, predictably, we find that sudden stops are significantly smaller among larger countries than among smaller ones.[20]

The group of sudden stops that required an adjustment in the current account also cover a wide range of countries, with small countries being subject to relatively violent swings in the capital account (sometimes associated with wars or domestic turmoil). When the group is ordered by country size, we find that the middle-income emerging economies are most prone to suffer from a large sudden stop. The striking conclusion is that many countries that are not usually part of the sudden stop debate, such as Chile and Venezuela in Latin America and the Philippines and Singapore in East Asia, appear to rank very high on the list of countries experiencing sudden stops.

When we restrict our analysis to the cases in which sudden stops led to domestic adjustment, Oman and Singapore emerge as the two countries with the largest number of sudden stops. The case of Singapore is particularly revealing, since it is usually absent from the discussion of sudden stop and crisis episodes. This confirms our assertion that empirical tests have much to gain from the use of a clean statistical criterion for identify-

20. The case of Argentina in 2001 reflects the large IMF packages provided that year. However, while not in our database, a big adjustment in the current account occurred in 2002.

TABLE 1. Largest Sudden Stops Requiring Domestic Adjustment, by Size of Episode and Size of Country[a]
Percent of GDP

Country	*Year*	*Change in the capital account*
By size of episode		
Kuwait	1992	−244.8
Yemen	1998	−63.9
Suriname	1987	−56.9
Kiribati	1991	−53.8
Suriname	1989	−49.8
Congo, Republic of	1984	−49.0
São Tomé and Príncipe	1977	−46.7
Jordan	1992	−44.1
Nicaragua	1989	−40.9
Congo, Republic of	1995	−34.0
Angola	2000	−32.8
Kiribati	1984	−30.6
Suriname	1992	−29.1
Congo, Republic of	1996	−28.3
Tonga	1989	−27.7
By size of country		
Spain	1992	−5.6
Canada	1982	−5.6
Korea	1997	−7.8
Saudi Arabia	1980	−14.9
Mexico	1982	−9.5
Brazil	1983	−7.8
Mexico	1995	−8.1
Iran	1979	−9.6
Russia	1998	−6.1
Indonesia	1997	−6.9
Venezuela	1980	−8.0
Korea	1986	−5.4
Denmark	1991	−5.2
Austria	1982	−5.6
Russia	1999	−6.0

a. Country size is measured as domestic GDP over U.S. GDP in the year of the episode.

ing events. This is further supported by the fact that Brazil, Argentina, and Mexico—which are usually central to the discussion on the impact of sudden stops—are relatively absent from the database, with only one or two events during the period.[21]

21. These countries may experience longer-lasting episodes.

TABLE 2. Largest Sudden Stops That Did Not Require Domestic Adjustment, by Size of Episode and Size of Country[a]

Percent of GDP

Country	*Year*	*Change in the capital account*
By size of episode		
Mozambique	1987	–34.3
Ecuador	2000	–30.4
Nicaragua	1983	–28.2
Albania	1990	–22.0
Malaysia	1994	–19.6
Malta	1995	–17.2
Bahrain	1982	–16.4
Antigua and Barbuda	1980	–14.7
Bahrain	1991	–14.3
Nigeria	1987	–14.3
Botswana	1977	–14.3
Moldova	1995	–12.7
Bahrain	1986	–12.4
Bolivia	1983	–12.3
Czech Republic	1996	–11.2
By size of country		
United Kingdom	1978	–6.5
Switzerland	1979	–8.8
Argentina	2001	–9.0
Norway	1994	–6.9
Denmark	2000	–8.9
Portugal	1992	–8.2
Greece	1997	–6.8
Poland	1988	–11.0
Greece	2001	–7.7
Malaysia	1994	–19.6
Singapore	1998	–8.9
Philippines	2000	–6.4
Czech Republic	1996	–11.2
Israel	1979	–7.8
Egypt	1993	–6.1

a. Country size is measured as domestic GDP over U.S. GDP in the year of the episode.

Figure 2 shows the incidence of both types of sudden stops by per capita income level.[22] The phenomenon of capital account reversals is present across all income levels, but the curve is hump shaped, with a larger incidence among middle-income countries. As expected, the sudden stops that

22. We compute the deciles from the whole sample using the 1974 per capita income levels.

TABLE 3. Largest Sudden Stops Requiring Domestic Adjustment in East Asia and Latin America[a]
Percent of GDP

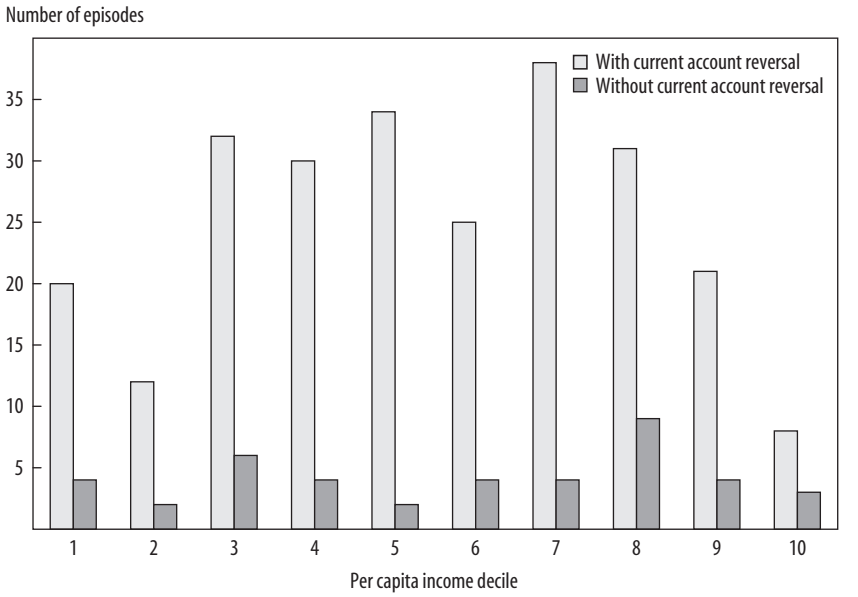
Region and country	*Year*	*Change in the capital account*
Asia		
Korea	1997	–7.8
Indonesia	1997	–6.9
Korea	1986	–5.4
Thailand	1997	–19.4
Hong Kong	2002	–7.6
Thailand	1998	–5.0
Thailand	1982	–5.4
Indonesia	1998	–6.7
Singapore	1994	–15.4
Philippines	1997	–8.5
Philippines	1983	–8.9
Singapore	2001	–11.7
Malaysia	1999	–10.6
Philippines	1999	–5.2
Singapore	1991	–7.9
Latin America		
Mexico	1982	–9.5
Brazil	1983	–7.8
Mexico	1995	–8.1
Venezuela	1980	–8.0
Argentina	1989	–10.4
Chile	1982	–10.4
Venezuela	1990	–7.4
Venezuela	1994	–9.5
Venezuela	1989	–7.8
Peru	1998	–5.5
Chile	1983	–16.8
Peru	1983	–6.7
Peru	1984	–5.8
Chile	1985	–8.5
Ecuador	1983	–13.4

a. Country size is measured as domestic GDP over U.S. GDP in the year of the episode.

do not lead to a current account reversal are skewed toward high-income economies.

Figure 3 displays the number of sudden stops per year as a percentage of classifiable observations. In contrast with what is usually argued, sudden stops have been a relatively common phenomenon since the early 1980s, with 4–8 percent of all countries usually suffering from an episode

FIGURE 2. Episodes by Income Level

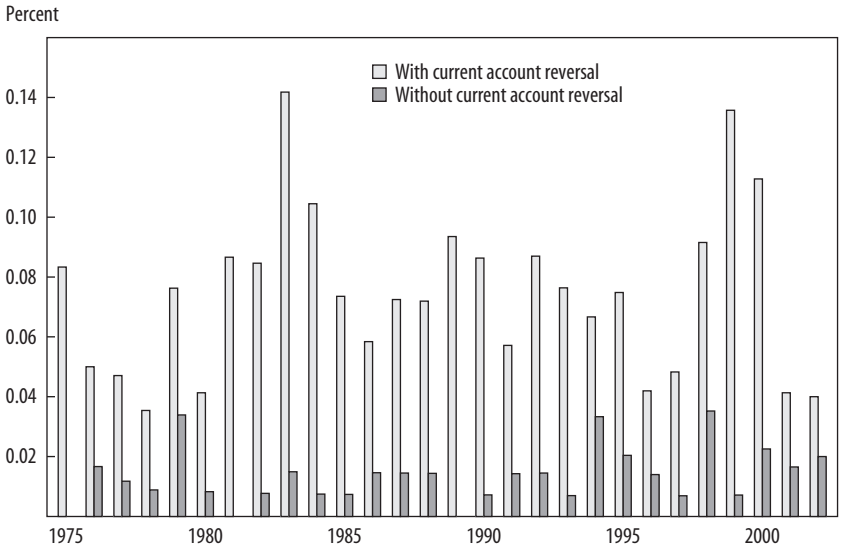


each year. In peak years, the data indicate that one in seven countries was subject to a sudden stop. Two peaks stand out: the debt crisis in 1983, which lasted for two years and then abated, and the aftermath of Russia's default, which lasted two years.[23]

In addition to being a relatively common phenomenon, sudden stops are extremely large and lead to major adjustments. Table 4 shows the size of the capital flow reduction and the size of the current account reversals, by region. The first panel focuses on the 265 cases in which a current account reversal followed the sudden stop. The average size of the sudden stops in this group is about 13 percent of GDP, with a maximum of close to 20 percent for Middle Eastern countries and a minimum of 6 percent for industrial countries. The adjustment of the current account appears to be similarly large and very fast. Current accounts improve by close to 10 percent of GDP, on average, in the first year, without any improvement after

23. The large peaks in 1979 and 1998 for sudden stops without current account adjustments can be explained by the strong increase in oil prices during those two years.

FIGURE 3. Episodes per Year, 1975–2002



that. Growth, in turn, drops below its trend by about 1 percent by the second year.

These averages hide large differences in growth performance among regions. Among nonindustrial countries, high-income countries suffer a growth reduction that is more than three times that of low-income countries. Similarly, Asia and Latin America suffer substantial output losses, while no output losses occur among eastern European, Pacific, and African countries. The cases in which sudden stops were not associated with a current account adjustment are somewhat smaller, at close to 11 percent of GDP, than for the group with an adjustment. In these cases, however, the current account deteriorates sharply rather than improving—particularly in the second year, when it shows an average deterioration of close to 5 percentage points of GDP relative to performance before the sudden stop. Output contracts, although the contraction is only half that found when the sudden stop was followed by an adjustment.

The dynamics of the current account adjustment also differ by region. Figure 4 shows the pattern of current account reversals for industrial,

TABLE 4. The Implications of Sudden Stops[a]

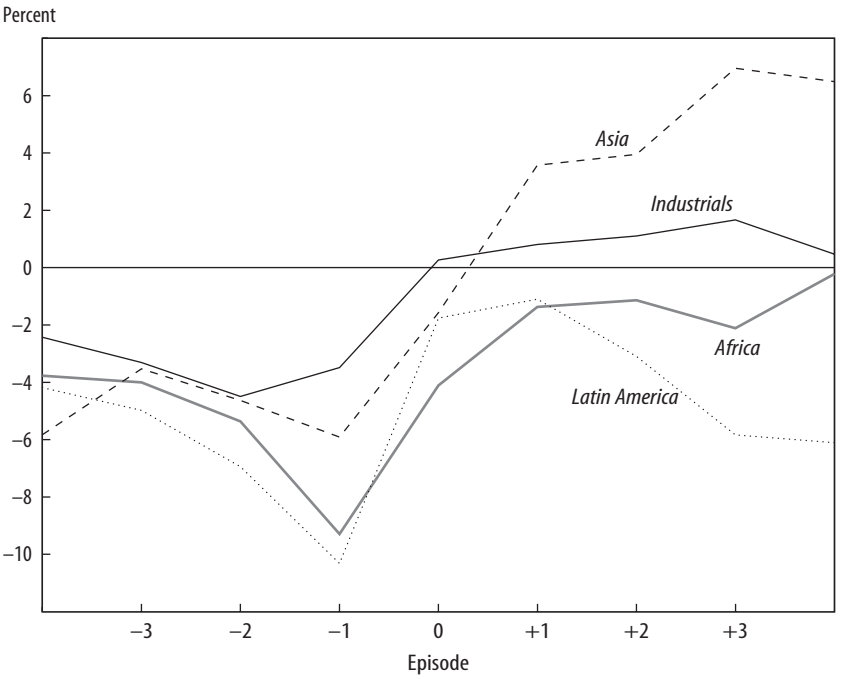
Type of episode and country group	*Change in capital account (percent of GDP)*	*Change in current account (percent of GDP)*	*Change in current account after 1 year (percent of GDP)*	*Change in GDP relative to trend (percent)*	*Change in GDP relative to trend after 1 year (percent)*
With domestic adjustment					
Industrial	−6.4	3.7	4.4	−2.5	−3.7
Nonindustrial	−13.4	6.6	6.5	−2.6	−1.3
High-income nonindustrial	−12.6	9.4	5.2	−3.5	−4.1
Africa	−13.8	9.3	7.7	0.0	0.3
Asia	−9.6	6.5	10.5	−2.0	−4.3
Middle East	−19.6	15.7	17.2	−0.4	−1.6
Latin America	−13.3	9.9	8.6	−2.1	−3.0
Eastern Europe	−8.8	5.0	7.0	1.3	3.8
Pacific	−14.9	12.8	8.2	1.8	1.0
Total	−13.1	9.6	9.2	−0.7	−1.1
Without domestic adjustment					
Industrial	−8.5	−1.2	−1.8	0.7	0.7
Nonindustrial	−11.2	−1.2	−5.7	−0.6	−0.7
High-income nonindustrial	−10.8	−0.5	−4.5	−1.1	−0.3
Africa	−11.1	−0.2	−4.1	0.6	4.4
Asia	−9.5	−0.4	−4.0	−1.6	−0.1
Middle East	−12.7	−4.3	−8.8	−1.2	−1.9
Latin America	−12.9	−1.1	−7.2	−0.2	−0.8
Eastern Europe	−9.6	−1.5	−5.8	−1.8	−6.7
Total	−10.6	−1.2	−4.9	−0.4	−0.4

a. All numbers are relative to the year previous to the sudden stop. The countries in each group are listed in the appendix.

Asian, Latin American, and African countries.[24] As expected, the smallest adjustments occur among industrial countries. Deficits among this set of countries are relatively small prior to the crisis, so the required improvement after the crisis is also small. In contrast, Latin American and African countries experience increasing deficits until the crisis hits, when they carry out a large adjustment. After this first adjustment, the current account deteriorates quickly again in the case of Latin American countries. In African countries, the current account continues to improve over the following years. For Asian countries, current account deficits also increase (though less so) prior to the crisis, but they then show a sustained and sizable recovery during the aftermath.

24. We eliminated Middle Eastern, Pacific, and eastern European countries, for which fewer data points were available.

FIGURE 4. Current Account Reversals



In Search of Fundamentals

In this section we are concerned with understanding the reasons why some countries manage to grow in the aftermath of a sudden stop, whereas others carry out the adjustment through a contraction in aggregate demand and output. In particular, we concentrate on how the degree of openness, the degree of liability dollarization, and the exchange rate regime affect the aftermath of a crisis.

Growth Regressions

Our basic specification looks at growth performance in the aftermath of the crisis, relating such growth to some basic country fundamentals. We run a pooled regression with the following specification:

$$\frac{\text{GDP}_{jt+i}}{\text{GDP}_{jt+i-1}} - \widehat{g}_j = \mu_r + \mathbf{X}_{1jt+i}\beta + \mathbf{X}_{2j}\gamma + \varepsilon_{jt+i},$$

where j denotes the country, μ_r stands for regional dummies, $\mathbf{X}_1$ corresponds to a matrix of contemporaneous exogenous variables post-crisis, and $\mathbf{X}_2$ corresponds to a matrix of variables that describe the characteristics of the economy prior to the crisis (note that they are not indexed by $t + i$). The subscript t represents the date of the sudden stop, and i ranges from zero to three. The dependent variable measures the growth performance after the crisis, so there is no evident endogeneity problem in this specification.

The dependent variable is measured as the change in growth performance, relative to trend $(\widehat{g}_j)$, at different horizons. We consider up to three years after the sudden stop. Trend growth is computed as the average growth rate for all available data for each country. The correction for trend behavior is essential for factoring out the country-specific determinants of long-run growth. In fact, since we are looking just at the short-run adjustment relative to long-run output trends, our growth specification does not include any of the traditional growth literature variables.

As contemporaneous variables we include the growth rate of global world exports (WEX_i, where i indicates the horizon over which the variable is computed), as a way of controlling for time-specific conditions.[25] We also include the change in the terms of trade (DLOGTT_i), which strongly affects short-run economic performance, and a dummy for the exchange rate regime. Like Edwards, we use Levy Yeyati and Sturzenegger's classification and concentrate exclusively on floating exchange rate regimes (LYSFLOAT).[26] We interact this variable with contemporaneous openness (OPENFLOAT) to test whether the relevance of the exchange rate regime changes with the degree of openness of the economy.

While the exogeneity of the terms of trade and world export growth variables is unquestionable, the choice of exchange rate regime may be endogenous to output growth. The link usually arises from the effect of output growth on currency crises or the effect of growth on the political

25. Exact definitions and sources for this and the following variables are provided in the appendix.

26. Edwards (2003); Levy Yeyati and Sturzenegger (2003a, 2003b, forthcoming). Edwards (2003) tests whether the exchange rate regime affects the aftermath of a current account reversal and finds a significant and positive effect only for floating regimes.

incentives to establish and maintain a fixed exchange rate regime.[27] We believe that these endogeneity problems should be sufficiently minor to be disregarded. Not only is the relation from growth to exchange rate regimes debatable and weak in the specifications that have found some relation, but more importantly, if this relationship may have been relevant in the run-up to a crisis, it is certainly less so in its aftermath. We therefore consider the exchange rate regime as exogenous in what follows.

Endogeneity is even less of a concern for the initial condition variables that describe the characteristics of the economy prior to the crisis. Among these we include the degree of openness (OPENNESS1), measured as the average of exports and imports as a percentage of GDP the year prior to the crisis. We expect this variable to be directly related to the economy's ability to adjust to external shocks. We also include a measure of lagged financial dollarization (FLM1), a variable that should be directly related to the economy's vulnerability to changes in the nominal exchange rate.[28] A banking crisis dummy (BANK) identifies sudden stops that coincide with a banking crisis, and the size of the capital account contraction (KAVAR) measures whether the economy's response depends on the size of the shock that it suffers.[29]

Table 5 shows the results for the group of countries where the sudden stop did not require an adjustment of the current account.[30] This first group included very few observations, which are further reduced by limited data availability for the exogenous variables. Therefore the empirical specification is computed only for the full sample and with a minimal specification that includes only the openness, size of the capital account shock,

27. On the former effect, see Frankel and Rose (1996); on the latter, see Edwards (1996).

28. We use line 26C of the IMF's *International Financial Statistics* (IFS), which corresponds to the foreign net liabilities of the financial sector, divided by lines (14 + 24) (base money plus demand deposits). While this variable is not a direct measure of liability dollarization, it has been used as a proxy in previous work. See Alesina and Wagner (2003).

29. We ran a number of alternative specifications in which we included a measure of fiscal deficits (contemporaneous and lagged), foreign direct investment, and proxies for overvaluation during the years prior to the sudden stop. None of these variables turned out to be significant, so we dropped them from the final specification shown in the paper. Also, we do not include a real exchange rate depreciation variable as in De Gregorio and Lee (2003). Our specification can be considered as the reduced form of a model in which output growth and the real exchange rate are both endogenously determined by the exogenous characteristics of the economy. In this context, the real exchange rate depreciation does not belong in the specification.

30. Numbers in parentheses correspond to heteroskedasticity-robust standard errors.

TABLE 5. Sudden Stops That Did Not Require Current Account Adjustment[a]

Explanatory variable	*After one year (1)*	*After two years (2)*	*After three years (3)*	*After four years (4)*
OPENNESS1	0.024	0.045	0.078	0.038
	(0.033)	(0.038)	(0.047)	(0.089)
OPENFLOAT	–0.098**	–0.131***	–0.139**	–0.140
	(0.045)	(0.042)	(0.053)	(0.088)
LYSFLOAT	0.057**	0.085**	0.079*	0.110
	(0.023)	(0.037)	(0.040)	(0.073)
FLM1	–0.008	–0.016	–0.016	–0.038
	(0.018)	(0.019)	(0.020)	(0.037)
KAVAR	–0.111	–0.142*	–0.044	–0.142
	(0.078)	(0.069)	(0.100)	(0.322)
WEX1	0.076	0.367**	0.644***	0.784**
	(0.131)	(0.133)	(0.206)	(0.326)
Constant	–0.015	–0.019	–0.021	–0.012
	(0.019)	(0.020)	(0.028)	(0.051)
Summary statistic				
Number of observations	26	26	26	23
R^2	0.35	0.50	0.53	0.43

* Statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level.

a. The dependent variable is measured as the change in growth performance, relative to trend. Regressions are performed on the full sample. Heteroskedasticity-robust standard errors are in parentheses.

exchange rate regime, liability dollarization, and world export growth variables. Each column relates to a particular time horizon.

This specification indicates that in the aftermath of a sudden stop, the economy's growth depends positively on world export growth. The coefficient is significant, and the elasticity seems to increase as time goes by. For these episodes neither liability dollarization nor openness seems to matter for output growth during the aftermath of the recovery. The exchange rate regime, however, appears to be strongly significant and particularly relevant for relatively closed economies, at least in the short run. The numbers suggest that countries that choose a floating regime grow 5.7 percentage points more, on average, in the first year, 8.5 percentage points more in the first two years, and 7.9 percentage points more in the first three years than countries that do not have a floating regime. Yet these numbers change depending on the degree of openness of the economy. While the above figures correspond to a country with zero openness, a country that has a 20 percent trade-to-GDP ratio would grow only 3.7 percentage points more the first year, 5.9 percentage points more in the first two years, and 5.1 percentage points more during the first three years with a floating exchange

rate versus a fixed exchange rate. This result may have to do with the fact that the transition to a float becomes critical in closed economies that need strong realignments of the exchange rate to adjust to a sudden stop. The relative growth benefit of choosing a float is thus highest for very closed economies, and it decreases as the economy becomes more open.

Table 6 shows results for those countries where a current account reversal followed the sudden stop. The results are presented, again, in columns that relate to the different time horizons, and where we incorporate all the variables described above. As a robustness check we present three subsamples within each horizon: the first column corresponds to the full sample; the second column focuses on the upper half of the income distribution within the group of nonindustrial economies; and the third column excludes countries with a terms-of-trade improvement larger than 5 percent of GDP, as in these countries the contraction in the capital account may be an optimal response to the large terms-of-trade improvement and not the result of a liquidity constraint faced by the economy.[31]

While the overall fit is relatively low and a substantial portion of output change remains unexplained in the first year (as indicated by a negative and statistically significant constant), some key results are quite consistent across time horizons and across subsamples. The global trade and terms-of-trade variables are usually strongly significant and with the expected positive signs. Sudden stops that occur when the world economy is expanding or the country's terms of trade are improving are less painful than those that happen when neither of those conditions is present.

The most important issue from a policy perspective is the role played by key decisions, such as the exchange rate regime, the degree of liability dollarization, and the degree of openness. The results on these issues are fairly constant. Liability dollarization hurts growth prospects in the aftermath of the sudden stop, while a floating regime and an open economy improve such prospects. Liability dollarization comes in negative and significant across all horizons and most subsamples, but the point estimate indicates that liability dollarization has to be very large to have quantitatively large effects. While this variable ranges from zero to a number several times the money stock, output growth falls only one-tenth

31. We excluded all countries for which the change in the terms-of-trade variable multiplied by openness (the average of exports and imports over GDP) was larger than 5 percent. Given data restrictions, the terms-of-trade variable had to be dropped in this specification.

TABLE 6. Sudden Stops Requiring a Current Account Adjustment[a]

	After one year			*After two years*			*After three years*			*After four years*		
Explanatory variable	*Full sample (1)*	*High-income nonindustrial (2)*	*Terms of trade[b] (3)*	*Full sample (4)*	*High-income nonindustrial (5)*	*Terms of trade[b] (6)*	*Full sample (7)*	*High-income nonindustrial (8)*	*Terms of trade[b] (9)*	*Full sample (10)*	*High-income nonindustrial (11)*	*Terms of trade[b] (12)*
INDUS	–0.010	0.000	0.011	0.000	–0.040	–0.001	–0.054**	0.000	0.001	–0.042	0.000	–0.002
	(0.015)	(0.000)	(0.017)	(0.000)	(0.025)	(0.027)	(0.027)	(0.000)	(0.029)	(0.032)	(0.000)	(0.035)
AFRICA	0.021	0.002	0.029	0.029	0.022	0.031	0.021	0.056	0.032	0.008	0.054	0.027
	(0.015)	(0.029)	(0.020)	(0.046)	(0.022)	(0.030)	(0.026)	(0.056)	(0.035)	(0.031)	(0.059)	(0.040)
ASIA	–0.033	–0.073**	–0.000	–0.057	–0.076***	–0.043	–0.104***	–0.017	–0.059	–0.088*	0.000	–0.077
	(0.020)	(0.036)	(0.024)	(0.054)	(0.027)	(0.036)	(0.037)	(0.082)	(0.046)	(0.051)	(0.100)	(0.053)
OTHER	0.022	0.022	0.038**	0.030	0.025	0.059**	0.029	0.035	0.069**	0.023	0.043	0.094**
	(0.014)	(0.017)	(0.016)	(0.028)	(0.022)	(0.025)	(0.030)	(0.035)	(0.034)	(0.040)	(0.046)	(0.046)
OPENNESS1	0.133***	0.192***	0.082	0.169*	0.169***	0.087	0.156**	0.069	0.098	0.199**	0.080	0.104
	(0.034)	(0.059)	(0.052)	(0.088)	(0.045)	(0.076)	(0.063)	(0.128)	(0.101)	(0.089)	(0.186)	(0.124)
OPENFLOAT	–0.052	–0.025	–0.037	–0.055	–0.075	–0.055	–0.103	–0.077	–0.081	–0.162	–0.177	–0.145
	(0.040)	(0.060)	(0.051)	(0.093)	(0.067)	(0.070)	(0.084)	(0.127)	(0.098)	(0.112)	(0.152)	(0.151)
LYSFLOAT	0.042***	0.062***	0.030*	0.085**	0.064***	0.053**	0.055*	0.068	0.060**	0.052	0.109*	0.070*
	(0.015)	(0.017)	(0.016)	(0.033)	(0.023)	(0.023)	(0.029)	(0.044)	(0.030)	(0.043)	(0.059)	(0.039)

KAVAR	0.074	0.068	0.017	0.150	0.127	0.107	0.090	0.127	0.153	0.130	0.202	0.212
	(0.060)	(0.052)	(0.079)	(0.095)	(0.087)	(0.119)	(0.105)	(0.132)	(0.148)	(0.172)	(0.224)	(0.170)
FLM1	–0.001***	–0.001***	–0.001**	–0.001*	–0.002***	–0.002**	–0.002***	–0.002**	–0.002	–0.002**	–0.002	–0.002*
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
BANK	–0.000	–0.017	–0.013	–0.010	0.004	–0.025	0.002	–0.023	–0.027	0.004	0.006	–0.011
	(0.015)	(0.022)	(0.019)	(0.031)	(0.020)	(0.023)	(0.021)	(0.037)	(0.025)	(0.026)	(0.044)	(0.030)
WEXI	0.062	0.041	0.104	0.022	0.051	0.132	0.110*	0.076	0.243**	0.189***	0.218*	
0.274***												
	(0.097)	(0.099)	(0.133)	(0.118)	(0.079)	(0.106)	(0.060)	(0.091)	(0.095)	(0.071)	(0.112)	(0.092)
DLOGTTI	0.078***	0.043		0.131**	0.150***		0.179***	0.120**		0.127**	0.033	
	(0.028)	(0.035)		(0.052)	(0.041)		(0.047)	(0.047)		(0.050)	(0.068)	
Constant	–0.062***	–0.083***	–0.052***	–0.065	–0.031	0.083	0.033	0.034	0.202**	0.119	0.189	0.242**
	(0.014)	(0.022)	(0.018)	(0.127)	(0.086)	(0.114)	(0.069)	(0.109)	(0.099)	(0.083)	(0.134)	(0.099)
Summary statistic												
Number of observations	152	76	110	73	145	110	131	65	110	120	57	106
R^2	0.23	0.38	0.13	0.36	0.32	0.17	0.36	0.32	0.19	0.25	0.27	0.19

* Statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level.

a. The dependent variable is measured as the change in growth performance, relative to trend. Heteroskedasticity-robust standard errors are in parentheses.

b. Excludes terms-of-trade shocks greater than 5 percent of GDP.

of one percentage point if the financial sector's foreign liabilities increase by the equivalent of the money stock.

Openness is also significant and with the expected positive sign, but its effect is diluted somewhat over time. Even so, the quantitative effect over the initial three years appears to be extremely large. With a coefficient between 0.13 and 0.19, the specification indicates that a change in the degree of openness of 10 percent of GDP is responsible for between 1.3 and 2.0 percentage points of additional GDP growth in the immediate aftermath of the crisis.[32]

The largest effect appears to come from the exchange rate regime. Choosing a floating regime seems to contribute to improving output performance by 4 to 6 percentage points in the aftermath of a sudden stop. Somewhat surprisingly, in this case the effects of the exchange rate regime are not affected by the economy's degree of openness.

The additional controls—namely, the size of the financial sector, the size of the shock to the capital account, and whether there had been a banking crisis—were not found to be relevant. Regarding regional dummies, the Latin American group is excluded so that the dummies highlight the growth difference with this group. No clear pattern arises from the dummies, indicating that differences in growth performance can be traced back to fundamentals.[33]

We now turn to the differential responses of Latin America and East Asia. What factors explain the different output performance? Barring different exchange rate regimes in the aftermath, the differences in growth performance can be estimated from our empirical results presented in table 6. The specification corresponding to high-income nonindustrial countries (column 2) can be used to estimate the impact of openness and foreign liabilities—the two significant variables in the specification—on first-year recovery (relative to trend growth) for any group of countries. The predicted differences appear to be very large. If we compare Hong Kong, Indonesia, Korea, and Malaysia with Argentina, Brazil, Chile, and Mexico, we find that the model predicts a difference in growth rates relative to trend of 9.6 percentage points between these two groups during the

32. The result at longer horizons has to be interpreted as cumulative growth; the relative constancy of the openness coefficient thus indicates that most of the differential effect occurs in the first year.

33. The Asian dummy, which appears to be negative and significant in some specifications, includes many countries beside the Asian tigers.

first year after the sudden stop. Even if we eliminate the very open economies of Hong Kong and Malaysia from the East Asian group, the predicted difference is still quite high at 4.4 percentage points. The difference between Korea and either Argentina or Brazil, to consider some narrower cases, is around 5 percentage points in both comparisons.

One potential criticism of the above specification relates to the possibility that the significance of some of these variables may be the result of sample selection bias. In particular, a larger degree of liability dollarization may make a country more prone to experience a financial crisis.[34] We believe this criticism is not relevant in the context of our specification because we consider the whole universe of the sudden stops in which we are interested (that is, there is no sample selected here), and there cannot be any endogeneity between the dependent variable, growth after a crisis, and liability dollarization prior to the crisis.

Export and Import Contribution to Adjustment

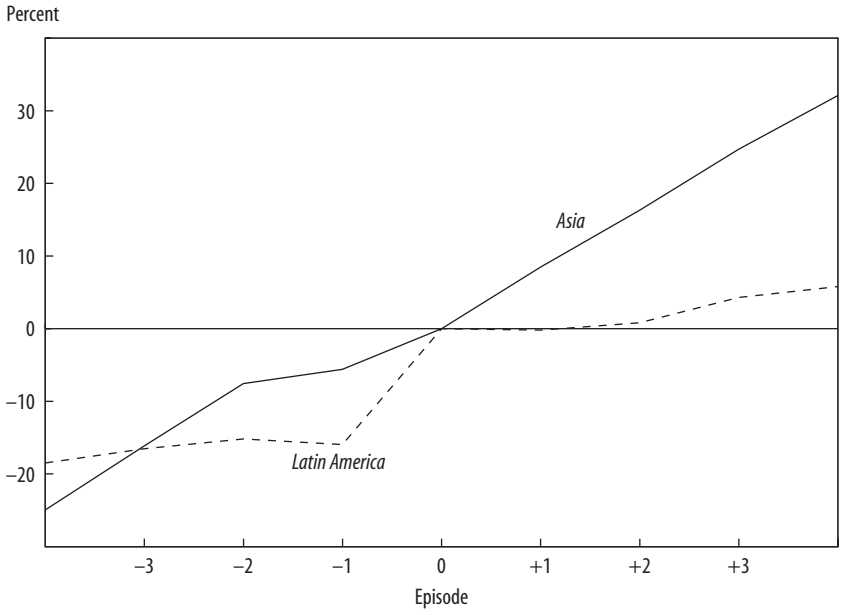
We now turn to studying the contribution of exports and imports to the adjustment in the current account and why the response of these two aggregates may differ by region. Some preliminary conclusions can be obtained by looking at the raw data. Figure 5 shows the change in real exports relative to the episode year for Asian and Latin American economies.[35] The two regions display very distinct patterns. In Latin America, exports are stagnant before the crisis, jump with the sudden stop, and then stagnate at the new higher level. In Asian countries, exports grow strongly throughout and somewhat accelerate their growth path in the years following the sudden stop. Figure 6 shows the same computation for imports. Here, the evolution of the two regions is more similar. The main difference is that Latin American countries show a higher level of imports during the three years prior to the crisis relative to the crisis year, while Asian imports fall less with the sudden stop and recover faster during the aftermath.[36]

34. Arteta (2003), however, argues that dollarization does not increase the likelihood of a financial crisis.

35. Real exports and imports are computed as the nominal value of exports and imports divided by the U.S. consumer price index.

36. The graph could include other countries, in particular industrial and African countries. Industrial countries show an evolution close to that of Asian economies, while African countries more closely resemble Latin America. We show these two cases to highlight the contrast in performance.

FIGURE 5. Exports

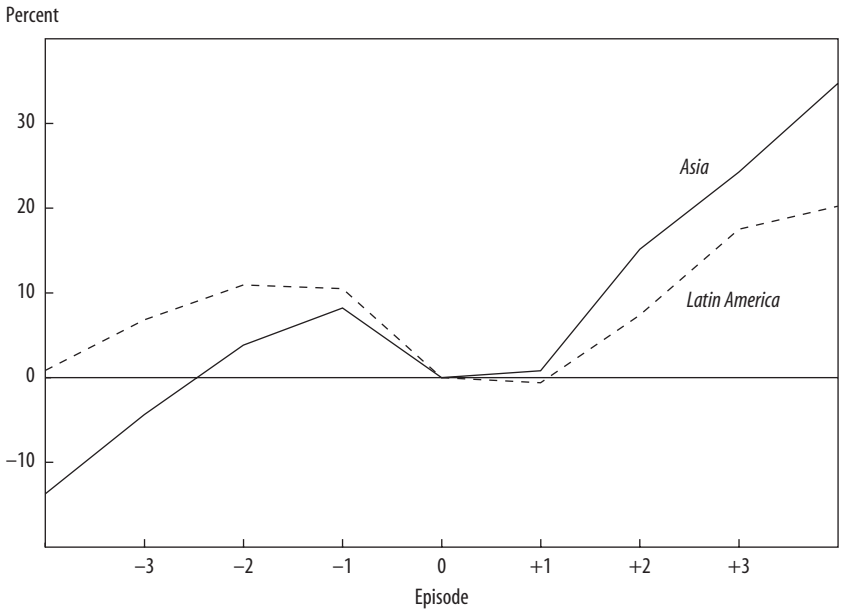


We next explore which factors are responsible for the fact that current account adjustments occur through an export-led boom rather than through a domestic demand contraction for the whole set of countries. Our main hypotheses are that openness and floating exchange rates should stimulate successful export growth and that liability dollarization should produce a collapse of imports (with exports less likely to be affected owing to their higher profitability in the aftermath of a crisis). Most of these hypotheses are verified (albeit weakly) in the data.

We test these hypotheses by computing the share of the current account adjustment that occurs through export expansions and the share that occurs through import contractions.[37] This requires a further restriction on the sample: to make the ratio meaningful we concentrate on those countries that experienced an improvement in the current account relative to the

37. These numbers do not necessarily add up to one because the denominator is the current account and not the trade balance.

FIGURE 6. Imports



year before the crisis (the classification procedure allows for a few countries where the current account did not improve in the first period or over two years).[38]

This ratio can be negative or larger than one. For example, consider a case in which the share of the current account that is accommodated through imports is larger than one. This indicates that exports must have fallen, such that imports have to contract more than the improvement in the current account. If the share of the current account adjustment accommodated through imports is negative, it implies that exports grew by more than the improvement in the current account, allowing for imports to grow as well. Conversely, in the case of exports, if the ratio of export growth to current account improvement is larger than one, this indicates that imports grew during the adjustment period. If the ratio is negative, imports also fell.

38. For the one- and two-year horizon, this implies dropping eighteen and fifty observations, respectively.

Our specification is as follows:

$$\frac{\text{EXPORTS}_{jt+i} - \text{EXPORTS}_{jt-1}}{\text{CA}_{jt+i} - \text{CA}_{jt-1}} = \mu_r + \mathbf{X}_{1jt+i}\beta + \mathbf{X}_{2j}\gamma + \varepsilon_{jt+i} \text{ and}$$

$$\frac{-(\text{IMPORTS}_{jt+i} - \text{IMPORTS}_{jt-1})}{\text{CA}_{jt+i} - \text{CA}_{jt-1}} = \mu_r + \mathbf{X}_{1jt+i}\beta + \mathbf{X}_{2j}\gamma + \varepsilon_{jt+i},$$

where the independent variables are as before. Table 7 shows the results for the full sample sequentially for export shares and import contribution for the year of the crisis and the first two years after the crisis.

Regarding exports, the numbers confirm the importance of openness: a larger share of the current account adjustment is executed through export growth in open economies than in relatively closed ones. Substantial regional differences apply at least in the very short run, with the best export performance found in industrial and Asian economies. Liability dollarization, on the other hand, diminishes the export contribution, indicating that exports also suffer from the effects of balance sheet mismatches in the aftermath of a crisis. These results find a mirror image in the import equation: liability dollarization induces a large contraction in imports, while openness induces a smaller contraction in imports, both over the first two years. For the import contribution, no significant result shows up in the immediate aftermath.

These preliminary results confirm a certain common pattern of adjustment. Open economies experience higher export growth and, therefore, less import contraction, whereas liability-dollarized countries undergo smaller growth of exports and a larger fall in imports.

These numbers allow comparisons between Latin America and East Asia. When we look at individual countries, the specification indicates that in Malaysia exports should contribute 82 percent of the improvement of the current account. This contribution drops as low as 41 percent in the case of Hong Kong, which is characterized by large liability dollarization. These figures contrast sharply with those of some Latin American countries. Given the characteristics of the Argentine economy, for example, the export contribution is expected to be a negative 1 percent—that is, exports do not contribute to the adjustment of the current account, but rather force an additional adjustment in imports. In Brazil, the export contribution is a paltry 4 percent.

TABLE 7. Contribution of Exports and Imports to Current Account Adjustment[a]

	Contribution of exports		*Contribution of imports*	
Explanatory variable	*After one year*	*After two years*	*After one year*	*After two years*
INDUS	2.433*	6.704	−1.109	−9.626
	(1.439)	(5.795)	(0.789)	(9.340)
AFRICA	0.206	−1.030	0.115	2.609
	(0.469)	(1.402)	(0.312)	(2.073)
ASIA	0.913*	0.569	−0.326	−0.277
	(0.544)	(0.432)	(0.418)	(0.523)
OTHER	−2.483	−1.640	4.134	1.876
	(1.825)	(1.789)	(2.714)	(2.064)
OPENNESS1	0.701*	0.856*	−0.642	−0.997*
	(0.413)	(0.438)	(0.389)	(0.542)
LYSFLOAT	−0.020	−0.244	−1.588	0.461
	(1.533)	(1.442)	(1.580)	(2.080)
FLM1	−0.059	−0.081*	0.053	0.078*
	(0.036)	(0.041)	(0.036)	(0.040)
Constant	0.106	0.537	0.469	−0.006
	(0.498)	(0.380)	(0.373)	(0.460)
Summary statistic				
Number observations	178	158	178	158
R^2	0.09	0.07	0.06	0.07

* Statistically significant at the 10 percent level.

a. In the first and second columns, the dependent variable is measured as the contribution of exports to current account improvement; in the third and fourth columns, the dependent variable is measured as the contribution of imports to current account improvement. Regressions are performed on the full sample. Heteroskedasticity-robust standard errors are in parentheses.

Import contributions also differ squarely. Import contraction aids the adjustment most strongly in Argentina, whereas imports contribute to a much lower extent in East Asian economies. The difference between Argentina and Thailand and Malaysia, for example, amounts to 45 percent and 96 percent of the current account adjustment, respectively.

Conclusions

Our analysis has focused on understanding why countries react differently to sudden stops. The discussion is not solely of academic interest. Countries have suffered substantial reversals in capital flows in recent years, suggesting that instability and capital flow reversals are a common occurrence in financial markets and will probably continue to be so. One of the surprising findings of our analysis is that sudden stops seem to be very

common. They occur in a very large number of countries and for a variety of reasons. Sudden stops are surprisingly common in Singapore, for example, whereas Kuwait and Jordan suffer large sudden stops in 1992 as a result of the Gulf War.

Policy discussions should therefore address the factors that best prepare an economy for the aftermath of a sudden stop and current account reversal. The fact that our sample includes several causes for the sudden stop, and not only the usual middle-income external crises that have been so common in recent years, contributes to a more powerful understanding of the factors that shape the aftermath of sudden stops. In fact, we show that some simple fundamentals can explain some of this different performance.

Economies that choose a floating exchange rate and are relatively open are likely to growth fastest in the aftermath of a sudden stop. The numbers are not small. In the aftermath of a crisis, countries with a floating exchange rate grow, on average, 4 to 6 percentage points more than those that do not float; this result increases to 6 to 8 percentage points in the first two years. Openness also has a large quantitative effect. According to the specification, open Chile should grow 4 percentage points more in the aftermath of a crisis than closed Brazil.

As expected, liability dollarization appears to be detrimental to growth performance in the aftermath of the crisis. Local-currency-prone Colombia, for example, should grow 0.23 percentage points more in the two years after the crisis than dollarized Argentina. The negative role of liability dollarization suggests that the domestic-currency denomination of financial sectors should be encouraged through appropriate prudential standards. Two factors must be taken into account, however: the effect is relatively small from a quantitative point of view, and avoiding dollarization may entail a cost in terms of reducing the size of the financial sector if domestic savings has a preference for foreign currency holdings. Moreover, in some cases the macroeconomic fundamentals may be sufficiently strong to make the probability of suffering a crisis very small. If a crisis is remote, then the negative effect of liability dollarization in the aftermath may be disregarded.

Our empirical specification predicts sizable differences in growth performance, and we find similar results in terms of the pattern of current account adjustment. This confirms what could be concluded from a preliminary look at the data: the open and financially nondollarized econo-

mies of Asia have a healthier export-led adjustment in the aftermath of a sudden stop.

Our results offer a first step toward understanding the effects of sudden stops in a way that furthers thinking about how to prepare emerging economies for such events. Our contribution has uncovered clear and plausible empirical regularities in the data. Much more work is needed—for example, in exploring the adjustment of investment and consumption patterns in response to a sudden stop.

Appendix: Definitions and Sources

The variables in the specification are defined as follows.

AFRICA is a dummy variable for African countries. ASIA is a dummy variable for Asiatic countries.

BANK is a dummy variable for banking crises, taken from Caprio and Klingebiel.[39]

DLOGTTi is the logarithmic difference of terms of trade *i* years after the episode, taken from WDI Exports as a capacity to import (constant LCU), NY.EXP.CAPM.KN.

EX_CAi is the contribution of exports to the current account improvement i years after the episode, taken from the IMF's International Financial Statistics (IFS) line 78AA/line 78AL.

FLM1 is the lagged ratio of foreign liabilities to money, taken from IMF IFS line 26C/line (12+24) (base money plus demand deposits).

GDPi represents GDP growth compared with long-run growth *i* years after the episode, taken from WEO series code NGDP_R. INDUS is a dummy variable for industrial countries.

IM_CAi is the contribution of imports to the current account improvement *i* years after the episode, taken from IMF IFS line 78AB/line 78AL.

KAVAR is the variation in the capital account in points of GDP, from IFS lines 78BCD, 78BJD, and 78CAD and from WEO series code NGDPD.

LYSFLOAT is a dummy variable for countries with a floating exchange rate regime, taken from Levy Yeyati and Sturzenegger.[40]

39. Caprio and Klingebiel (2003).
40. Levy Yeyati and Sturzenegger (forthcoming).

OPENNESS1 is lagged openness, which is defined as the ratio of exports plus imports divided by two to GDP, obtained from IMF IFS lines 90C, 98C, and 99B.

OPENFLOAT is the interaction between OPENNESS and LYSFLOAT.

OTHER is a dummy variable for countries that are from eastern Europe, the Pacific, or the Middle East.

WEXi is the variation in world exports *i* years after the episode, from IFS line 70d.

The groups of countries identified in the paper contain the following economies:

—Industrials: Austria, Canada, Denmark, Finland, Iceland, Ireland, Malta, Norway, Portugal, and Spain.

—Nonindustrials: Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Azerbaijan, Bahamas, Bahrain, Barbados, Belize, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Chile, Comoros, Congo, Côte d'Ivoire, Croatia, Cyprus, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Fiji, Gabon, Gambia, Georgia, Ghana, Grenada, Guinea-Bissau, Guyana, Hong Kong (China), Hungary, Indonesia, Iran, Israel, Jamaica, Jordan, Kiribati, Korea, Kuwait, Kyrgyz Republic, Laos, Latvia, Lesotho, Libya, Lithuania, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Myanmar, Nepal, Netherlands Antilles, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russia, Rwanda, Samoa, São Tomé and Príncipe, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Singapore, Solomon Islands, South Africa, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Syrian Arab Republic, Thailand, Togo, Tonga, Trinidad and Tobago, Turkey, Ukraine, Uruguay, Vanuatu, Venezuela, Zambia, and Zimbabwe.

—Higher-income nonindustrials: Algeria, Angola, Argentina, Bahrain, Bolivia, Brazil, Bulgaria, Cameroon, Chile, Côte d'Ivoire, Croatia, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Hong Kong (China), Hungary, Indonesia, Iran, Israel, Korea, Kuwait, Libya, Lithuania, Malaysia, Mexico, Morocco, Myanmar, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, Singapore, Syrian Arab Republic, Thailand, Trinidad and Tobago, Turkey, Ukraine, Uruguay, Venezuela, and Zimbabwe.

—Africa: Algeria, Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Djibouti, Egypt, Ethiopia, Gabon, Gambia, Guinea-Bissau, Lesotho, Libya, Malawi, Mali, Mauritania, Mauritius, Morocco, Niger, Nigeria, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Togo, Zambia, and Zimbabwe.

—Asia: Hong Kong (China), Indonesia, Korea, Laos, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Singapore, and Thailand.

—Middle East: Bahrain, Cyprus, Iran, Israel, Jordan, Kuwait, Oman, Saudi Arabia, Syrian Arab Republic, Turkey, and Yemen.

—Latin America: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guyana, Jamaica, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, and Venezuela.

—Eastern Europe: Albania, Armenia, Azerbaijan, Bulgaria, Croatia, Estonia, Georgia, Hungary, Kyrgyz Republic, Latvia, Lithuania, Poland, Romania, Russia, and Ukraine.

—Pacific: Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu.