Current Account and Real Exchange Rate Changes: The Impact of Trade Openness

Davide Romelli, Cristina Terra, Enrico Vasconcelos

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Davide Romelli
Cristina Terra
Enrico Vasconcelos

L'esprit pionnier

Current Account and Real Exchange Rate changes: the Impact of Trade Openness*

Davide Romelli†
Université de Cergy-Pontoise, THEMA and ESSEC Business School

Cristina Terra
ESSEC Business School and THEMA, 95012 Cergy, France

Enrico Vasconcelos
Banco Central do Brasil

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Abstract

This article investigates the impact of trade openness on the relationship between current account and real exchange rates, during episodes of sudden stops and of abrupt exchange rate depreciations. Using data for developed and emerging economies for the period 1970–2011, we find that more open economies are associated with lower exchange rate depreciations during sudden stops. We also provide evidence that, during abrupt exchange rate depreciation episodes, economies that are more open to trade experience a larger change in current account and trade balance. In other words, our results indicate that improvements in current account and trade balance are accompanied by a smaller exchange rate depreciation in more open economies. These findings are robust to different measures of openness to trade and methodologies of identifying sudden stops and abrupt exchange rate depreciations.

Keywords: trade openness; sudden stops; exchange rate depreciation.
JEL classification: F31, F32.

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†Corresponding author: davide.romelli@essec.edu.

1 Introduction

Advanced and emerging economies alike have experienced a high growth in capital flows over the past twenty years. Throughout the 2000s, this growth was accompanied by large current account imbalances, raising many concerns with respect to the potential adverse consequences of abrupt interruptions of these capital flows. In particular, the magnitude of exchange rate depreciation over the adjustment process of current accounts has been a key element of discussion (Obstfeld and Rogoff, 2005, 2007; Corsetti et al., 2013), reviving the famous debate between John Maynard Keynes and Bertil Ohlin over the payment of war debts in Germany during the 1920s, known as the "Transfer Problem".

In the transfer problem debate, Keynes (1929) argued that, in order to pay for the war damages in foreign currency, Germany would have to raise resources through trade balance surpluses. The relative price of tradable goods would then have to increase, implying a real exchange rate (RER) depreciation. According to Ohlin (1929), however, the decline in Germany's disposable income due to the external payments would entail an increase in trade balance with lesser relative price changes. The mechanism is that, with lower income, the country would buy less of "the goods which go easily between them", using Ohlin's words, thereby improving its trade balance. Clearly, the efficiency of this mechanism depends on the share of those goods in the consumption basket, that is, on the degree of openness of the economy.[1]

The reversion of large current account imbalances brings about a similar adjustment mechanism, where the magnitude of RER depreciations may be mitigated by the income effect, particularly in more open economies. In this paper, we take this adjustment mechanism to the data. More specifically, we ask: are current account reversals achieved with lesser RER depreciation in more open economies?

Clearly, many different variables may affect the relationship between RERs and current accounts, such as changes in the terms of trade or in the relative productivity across sectors and across countries. It would be a daunting, if not an impossible task, to control for all of them. To circumvent this problem, we focus our analysis on episodes of sudden stops in capital flows and of abrupt RER depreciations. In the case of sudden stops, it is reasonable to assume that, on average, other shocks affecting current accounts and RERs would assume a lesser role, so that the observed RER change would be associated to the current account movement. By the same token, in events of abrupt exchange rate depreciation, the corresponding change in current account can be taken as mostly related to the observed

[1] This debate has also been related to the experience of Greece during the Eurocrisis in 2011, since its inability to depreciate its currency has impeded a current account reversal.

exchange rate depreciation.

Previous research generally recognizes the importance of openness to trade in determining a country's vulnerability to sudden stops. For example, Calvo et al. (2004) and Cavallo and Frankel (2008) present evidence that more open economies, understood as countries with a larger supply of tradable goods, are less prone to sudden stops in capital flows. The currency crises literature equally stresses the importance of trade openness. Examining the factors that help predict the occurrence of these extreme episodes, Milesi-Ferretti and Razin (2000) find that a higher degree of openness to trade decreases the probability of exchange rate crises. Moreover, they also show how more open economies tend to grow faster in the aftermath of a currency crisis. Similar findings are discussed in Glick and Hutchison (2011), who show that greater trade integration reduces a country's likelihood of experiencing a currency crisis. They argue that a greater openness ratio decreases the likelihood of sharp reversals of capital flows, as the country is more able to service its external obligations.

All in all, this literature has established the importance of trade openness in mitigating a country's vulnerability to sudden stops and currency crises. We take a new perspective by investigating the role of trade openness *during* these episodes. More specifically, we analyze the role played by trade openness on the relation between current account and RER during sudden stops and abrupt RER depreciation episodes, for both advanced economies and emerging markets.

In a simple theoretical framework, we discuss the mechanism through which trade openness can impact the relationship between current account reversals and RER changes. We model a two-sector small open economy in which sudden stops can occur due to binding collateral constraints on the country's external debt. We show that the effect of sudden stops differs according to the degree of openness of the economy. In particular, more open economies experience a lower exchange rate depreciation, in order to achieve the same change in the current account.

We examine this mechanism for a sample of both advanced and emerging economies during the period 1970–2011. We identify sudden stops and abrupt RER depreciation episodes by following a methodology used in the sudden stops literature. We first show that during sudden stops more open economies endure a lower depreciation of the RER. This motivates our investigation of the impact of trade openness on current account/trade balance reversals during extreme events such as sudden stops and exchange rate depreciations.

We find that trade openness has a positive and significant impact on current account and trade balance variations during these extreme events. This effect is also economically significant. For example, a 1% RER depreciation in a country with an average degree of openness in our sample is associated with a 2% increase in current account and a 1.5% increase in trade balance

as share of GDP. For a country in the 1^{st} quartile of openness, however, the same variation in the current account and trade balance will require a RER depreciation of more than 11% and 6.7%, respectively. These results imply that more open economies seem to be able to reach equilibrium in the balance of payments with lesser RER depreciation. Furthermore, these findings are robust to the use of different proxies for openness to trade, as well as different methodologies for identifying episodes of sudden stops and abrupt exchange rate depreciations.

The outline of the paper is as follows. In Section 2 we present a theoretical framework that establishes how openness affects exchange rate depreciation under sudden stops. Section 3 describes the data, while the empirical results are presented in Section 4. Section 5 concludes.

2 Theoretical Framework

This section presents a simple theoretical framework that captures the main mechanism highlighted in this paper: in more open economies, lesser RER depreciations are associated with stronger current account reversals. The formal specification of the model follows the small open economy literature with tradable and nontradable goods sectors in the presence of credit constraints (see Mendoza, 2005, 2010; Bianchi, 2011; Korinek and Mendoza, 2013).

Consider an economy populated by a continuum of identical households which receive in every period an endowment of tradable (y_t^T) and nontradable (y_t^N) goods. They allocate their consumption basket (C_t) between these two goods to maximize their life-time utility function:

$$U = \sum_{t=0}^{\infty} \beta^t u\left(C_t\right), \tag{1}$$

where β is the discount factor. For simplicity, we assume Cobb-Douglas preferences, so that:

$$C_t = \left(c_t^T\right)^{\gamma} \left(c_t^N\right)^{1-\gamma}, \tag{2}$$

where γ is the share of tradable goods in consumption. Households can invest in a foreign asset denominated in units of tradable goods. This asset matures in one period and pays a fixed gross interest rate R. Taking the price of tradables as the numeraire and denoting by p_t^N the price of nontradables, the representative household's budget constraint can be written as:

$$b_{t+1} + c_t^T + p_t^N c_t^N = y_t^T + p_t^N y_t^N + Rb_t, \tag{3}$$

where b_{t+1} represents the amount of bonds held by the household at time t.[2]

We assume that this economy faces a credit constraint. More specifically, we assume that access to foreign financing is constrained to a fraction k of tradable income. In this case, the credit constraint is represented by:

$$b_{t+1} \geq -ky_t^T. \tag{4}$$

The market clearing condition in the nontradables sector is given by $c_t^N = y_t^N$, which we substitute into the budget constraint in equation 3 to rewrite it as:

$$c_t^T = y_t^T + Rb_t - b_{t+1}. \tag{5}$$

Our main interest lies in investigating the impact of sudden stops on this small open economy. In line with Mendoza (2005, 2010); Bianchi (2011); Korinek and Mendoza (2013), we model sudden stops as situations in which the international borrowing constraint becomes binding. These events will generate a decrease in tradable goods consumption, a RER depreciation and a current account deficit smaller than desired. Hence, we start by describing the equilibrium when the credit constraint is not binding, and then we compare this with the situation when it is binding. Finally, we show how the effect of a sudden stop differs according to the degree of openness of the economy.

2.1 Non-binding credit constraint

Assume that nontradable output is constant over time, $y_t^N = \bar{y}^N$, for all t and that $\beta R = 1$. Given these assumptions, when the credit constraint does not bind, the equilibrium simply reflects a perfect consumption smoothing of tradable goods: $c_t^T = \bar{c}^T$ for all t. Under a no-Ponzi game condition, the intertemporal budget constraint 5 implies the following constant tradables consumption:

$$\bar{c}^T = \left(\frac{R-1}{R}\right)\left(\sum_{t=0}^{\infty} R^{-t} y_t^T + Rb_0\right). \tag{6}$$

Consumers maximize utility when the relative price of nontradables is equal to the marginal rate of substitution between the two types of goods:

$$p_t^N = \left(\frac{1-\gamma}{\gamma}\right)\frac{c_t^T}{\bar{c}^N} \equiv \bar{p}^N. \tag{7}$$

Note also that the RER (ε), which is the ratio between the price of tradables and nontradables ($\varepsilon_t = \frac{1}{p_t^N}$), is also constant ($\bar{\varepsilon}$) in this unconstrained economy.

[2]Here b corresponds to the net international investment position. Notice that debtor countries present a negative value of b.

To simplify notation, we follow Mendoza (2005) and define a sequence of time invariant tradables endowment $\bar{y}^T$ that yields the same present value of the actual arbitrary time varying sequence of tradables income. We denote this virtual sequence of constant endowment the *permanent endowment*. According to this definition, tradables consumption under no credit constraints (equation 6) is equal to the permanent endowment, as in:

$$\bar{c}^T = \bar{y}^T + (R-1)\, b_0, \tag{8}$$

where b_0 is the initial net international investment position of the country.

Let us consider a country that is accumulating foreign debt, with a non-binding credit constraint. In terms of our model, it means that the current endowment of tradables, y_t^T, is smaller that its permanent endowment, $\bar{y}^T$. Debt accumulation, which is also the current-account balance, is given by:

$$b_{t+1} - b_t = y_t^T - \bar{y}^T < 0. \tag{9}$$

At some time in the future, tradables endowment will be higher than its permanent value, in such a way that the country will eventually reimburse its debt.

2.2 Binding credit constraint: sudden stop episode

We now analyze the impact of a **sudden stop**, which is a situation in which the country would be willing to get more indebted but foreign investors are not willing to offer that credit. Sudden stops may be triggered, for instance, by contagion from crises in other countries. We capture this situation in our model by a shock to the credit constraint parameter k. This parameter decreases to a new value k^{SS} that renders binding the liquidity constraint 4, that is, $b_{t+1} < -k^{SS} y_t^T$. We define as b_{t+1}^{SS} the debt level that satisfies the new liquidity contraint, such that $b_{t+1}^{SS} = -k^{SS} y_t^T > b_{t+1}$

Under the new credit constraint, consumers are no longer able to completely smooth consumption of tradables. Tradables consumption becomes:

$$c_t^{T,SS} = \left(1 + k^{SS}\right) y_t^T + R b_t, \tag{10}$$

which is smaller than the original consumption smoothing plan: $c_t^{T,SS} < \bar{c}^T$. Moreover, the price of nontradables is now equal to:

$$p_t^{N,SS} = \left(\frac{1-\gamma}{\gamma}\right) \frac{c_T^{T,SS}}{\bar{c}^N} < \bar{p}^N, \tag{11}$$

which means a more depreciated RER: $\varepsilon_t^{SS} > \bar{\varepsilon}$.

Notice that, with the binding credit constraint, the current account is also larger than in the case of the unconstrained economy, i.e. $b_{t+1}^{SS} - b_t >$

$b_{t+1} - b_t$, since $b_{t+1}^{SS} > b_{t+1}$. Furthermore, the difference between the two values of the current account is captured by the drop in tradables consumption. From equation 5, we have that the relation between the drop in consumption and the change in current account is:

$$\bar{c}^T - c_t^{T,SS} = \left(b_{t+1}^{SS} - b_t\right) - \left(b_{t+1} - b_t\right) \equiv \Delta CA > 0, \tag{12}$$

where ΔCA corresponds to the increase in current-account balance induced by the sudden stop.

In sum, when an unanticipated shock triggers the credit constraint to bind, i.e., when a sudden stop episode occurs, we have that: (i) the consumption of tradable goods decreases, (ii) the real exchange rate depreciates, and (iii) the current account deficit is smaller than it would be under no credit constraint.

2.3 The role of trade openness

We define the degree of openness of an economy as the share of tradable goods in consumption, which, given consumers' preferences represented in equation 2, can be expressed as:

$$Openness_t = \frac{c_t^T}{p_t^N \bar{c}^N + c_t^T} = \gamma. \tag{13}$$

From equation 10, we see that trade openness affects the equilibrium price of nontradables. Substituting the consumption level under sudden stop from equation 12 into the pricing equation 11 and rearranging, we have that:

$$p_t^{N,SS} = \left(\frac{1-\gamma}{\gamma}\right)\left(\frac{\bar{c}^T - \Delta CA}{\bar{c}^N}\right). \tag{14}$$

Equation 14 establishes the relation between the equilibrium price of nontradables and the change in the current-account balance brought about by the sudden stop. According to this equation, the higher the increase in current-account balance (higher ΔCA), the lower will be the price of nontradables (more depreciated RER). Moreover, as depicted in the equation, also trade openness affects this relation: in more open economies, there is a smaller price change for a given change in current-account balance.

Going back to the Keynes-Ohlin debate, we could say, in light of this argument, that Ohlin would be right for economies with a high degree of openness. The credit constraint triggered by a sudden stop decreases the disposable income, depressing consumption of both types of goods. Nontradables prices have then to decrease to reestablish equilibrium in the nontradables market. The more open the economy, the larger is the decrease in total tradables consumption and the smaller the decrease in nontradables

consumption for a given decrease in available income. Hence, the lesser the relative price change.

We investigate whether the data meets this argument: does the relation between current account changes and RER depreciations is affected by trade openness? In order to try and capture the sort of credit constraint shock depicted in our theoretical framework, we investigate the relation between these two variables in events of sudden stops, which are defined as episodes of sudden reversals of capital flows.

As we will explain in detail in the next section, sudden stops are identified as periods in which capital inflow falls by at least two standard deviations below its mean. However, there may be situations in which volatility of capital flows is so high, that an economically significant reversal of capital flow is not identified as a sudden stop. Nevertheless, it would still require current account and RER adjustments. In order to capture those episodes, as an alternative to sudden stop episodes, we investigate events of abrupt exchange rate depreciations.

3 Event analysis and data

This section describes how we identify sudden stops and exchange rate depreciation episodes, which are the events on which we base our empirical investigation. We use quarterly data from the IFS-IMF database for a sample of 181 developed and emerging economies for the period 1970-2011.[3]

3.1 Sudden stops

We define sudden stops following the methodology implemented by Calvo et al. (2004). We identify an episode as a sudden stop when the year-over-year change in quarterly net capital flows falls two standard deviations below its mean.[4] As common in the literature, once an episode is identified, we set the beginning of the sudden stop in the first quarter in which the fall in capital flows is larger than one standard deviation below its mean. The episode ends once the fall in net capital flows is smaller than one standard deviation.

[3]The list of countries and the period of availability of the data are provided in Appendix Table A1.

[4]In our approach, we follow a large literature that identifies sudden stops as changes in net capital flows. Recent studies on sudden stops are interested in the behavior of different types of gross capital flows and their role in the determination of sudden stops (see Broner et al., 2013; Calderón and Kubota, 2013; Forbes and Warnock, 2012; Rothenberg and Warnock, 2011). Abrupt reversals in these gross capital flows are not necessarily associated with abrupt falls in net capital inflows and are generally due to cross-border bank flows. However, there is no clear evidence that these reversals are associated with real exchange rate depreciations and current account adjustments, which are our main variables of interest.

In line with Calvo et al. (2004), and contrary to other studies (i.e. Guidotti et al., 2004; Edwards, 2004; Calderón and Kubota, 2013), we do not normalize the changes in capital flows by GDP and exclude the episodes for which the shock does not exceed a certain threshold of GDP. By limiting sudden stops to events for which the change in net capital flows exceed a certain threshold (for example Guidotti et al., 2004, fix this threshold at 5% of GDP), we might exclude episodes that occurred in countries characterized by a low capital flows volatility or less open economies.

Our methodology differs from Calvo et al. (2004) in three main aspects. First, we adapt this methodology to quarterly data and compute the year-over-year changes to avoid seasonal fluctuations. Second, we use three different approaches to computing the average and standard deviation of capital flows. In addition to the historical average used by Calvo et al. (2004), we identify sudden stops by looking at the three/five years moving averages and standard deviations. By limiting the time horizon for the computation of the mean, we are able to detect more accurately "unexpected" reductions in net capital flows. Our baseline specification considers the three year moving average and standard deviation, but we estimate our results using all alternative models. Finally, whenever we identify two sudden stops episodes separated by only one quarter, we consider them as a unique episode.

We proxy the capital inflows K of country c in quarter q as the quarterly change in international reserves IR minus the quarterly current account CA:[5]

$$K_{c,q} = (IR_{c,q} - IR_{c,q-1}) - CA_{c,q}. \tag{15}$$

The year-over-year changes in capital flows are then defined as $\Delta K_{c,q} = K_{c,q} - K_{c,q-4}$. We identify sudden stops whenever the following condition is met:

$$\Delta K_{c,q} < \mu_q(\Delta K_{c,q}) - 2\sigma_q(\Delta K_{c,q}), \tag{16}$$

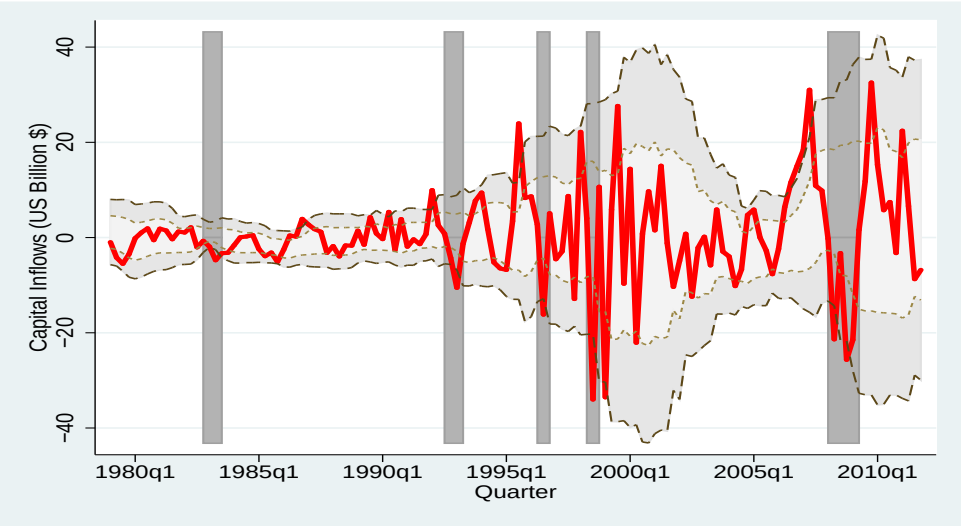
where μ_q and σ_q represent the three year moving average and standard deviation, respectively in our baseline regressions. We also consider the five year and historical moving averages in alternative specifications.

As an example, the vertical bars in Figure 1 depicts the sudden stop episodes identified for Brazil from 1979 to 2011. The solid line plots $\Delta K_{c,q}$. The values within the dashed lines are up to two standard deviations above and below the three years moving average, while the short dashed lines delimit values within one standard deviation of that average. During this period, Brazil experienced five sudden stops, as highlighted by the vertical bars.

Using this methodology we identify 325 sudden stop episodes for a sample of 105 countries, during the period 1970-2011: 204 of them occurred in

[5] All series are measured in constant 2005 dollars.

Figure 1: Sudden stops in Brazil (1979-2011)



emerging markets and developing countries (as classified by the IMF World Economic Outlook) and 121 in advanced economies. Figure 2 shows the dispersion of sudden stops across countries.

Figure 2: Sudden stop episodes across countries (1970-2011)

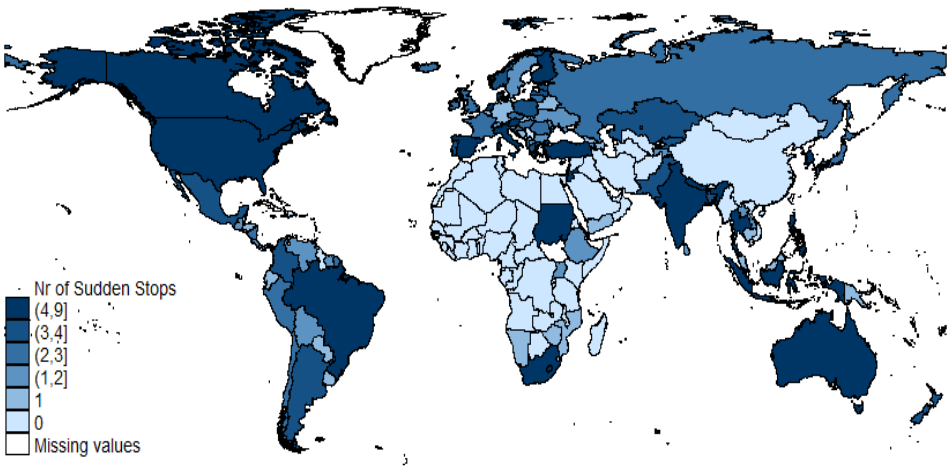
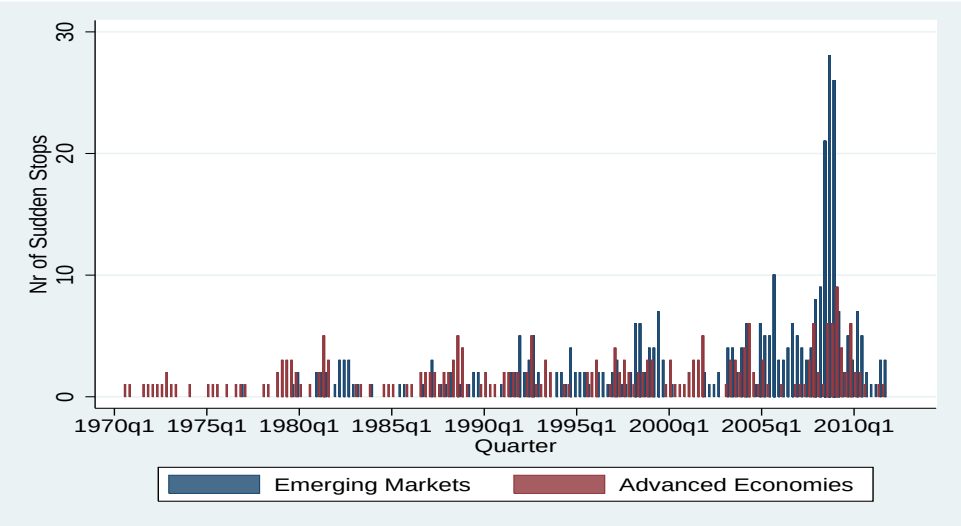


Figure 3 shows the distribution of these events across time. For advanced economies, we observe an increase in sudden stop episodes during the European Monetary System crisis (1990 and 1992) and the Asian crisis (1998). In emerging markets these episodes are concentrated around the Mexican (1994 to 1995), Asian (1997), Russian (1998) and Argentinean (2001) crises.

Figure 3: Frequency of sudden stops (1970-2011)



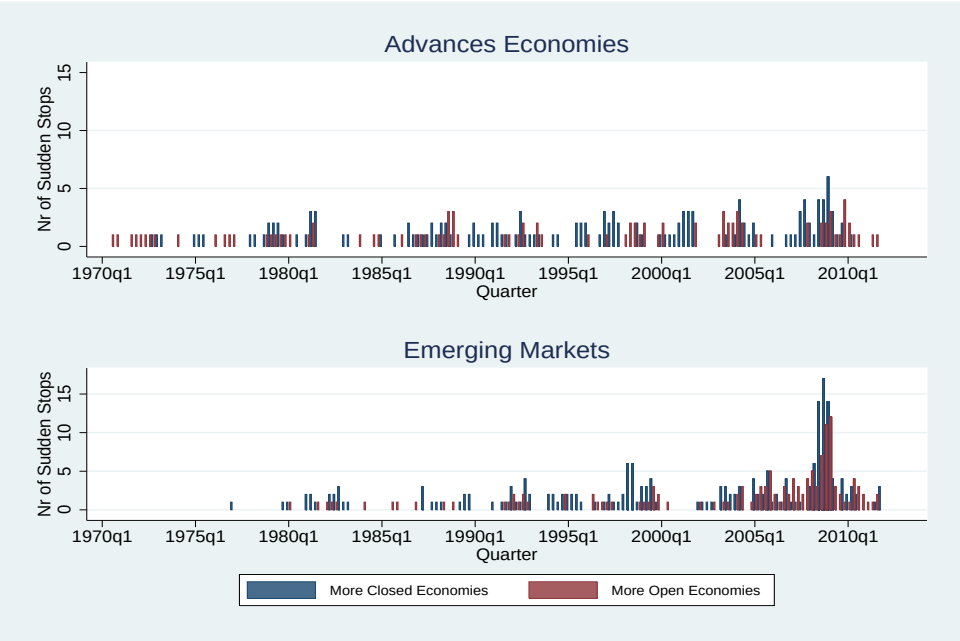
Note that there are missing data for many emerging market economies before the 1990s, which may explain the relatively fewer sudden stops among those countries for the first twenty years of our sample. Looking at the period 1990–2011, we find 157 sudden stops in capital flows among emerging and developing countries and 84 in advanced economies. As expected, these events are much more common in emerging markets. A large number of sudden stops in both emerging and developed economies is detected over the late 2000s, in the midst of the global financial crisis.

Next, we split our sample in terms of their openness to trade (see also Rey and Martin, 2006). We measure trade openness as the average of exports plus imports as a ratio of GDP, over the whole period. We then classify as more open economies those for which the openness ratio is above the median of its group. Figure 4 confirms that more closed economies have experienced a higher number of sudden stops among both advanced economies and emerging markets, in line with the results from Calvo et al. (2004) and Cavallo and Frankel (2008).

3.2 Episodes of abrupt exchange rate depreciations

Empirical studies on exchange rate variations commonly focus their attention on nominal exchange rate movements and, more specifically, on currency crises (see, among others, Milesi-Ferretti and Razin, 2000; Laeven and Valencia, 2013). We, in turn, focus on identifying episodes of abrupt RER

Figure 4: Frequency of sudden stops, by degree of openness (1970-2011)



depreciation.[6]

We introduce the concept of **abrupt real exchange rate (RER) depreciations**, applying to RERs the same methodology used for the identification of sudden stops, described in subsection 3.1. More precisely, an abrupt RER depreciation occurs when the year-over-year depreciation of the quarterly real exchange rate is larger than two standard deviations above its mean. Moreover, the episode window of a RER depreciation: i) begins once the RER depreciation is higher than one standard deviation above its mean; ii) ends when the RER increase falls below one standard deviation of its mean.

We use the real effective exchange rate (REER) as an alternative measure, even if the availability of REER data is restricted to a smaller sample of countries and a shorter period.[7] We compute episodes of abrupt REER

[6]The real exchange rate ε of country c in quarter q is measured as the nominal exchange exchange rate E, defined as domestic currency per unit of US dollar, multiplied by the ratio between the consumer price index in the US and in country c:

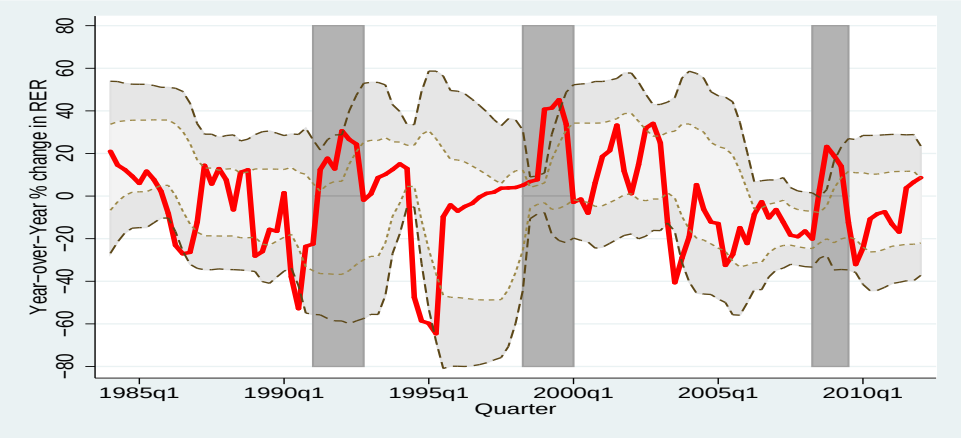
$$\varepsilon_{c,q} = E_{c,q} * \frac{CPI_{US,q}}{CPI_{c,q}}.$$

We then compute the yearly change of the quarterly RER as: $\Delta\varepsilon_{c,q} = ln(\varepsilon_{c,q}/\varepsilon_{c,q-4})$.

[7]The IMF defines the REER as domestic price index divided by foreign price indices, measured in the same currency, so that a decline in its value denotes a real depreciation of the home currency. To facilitate a comparison of the results obtained for REER with

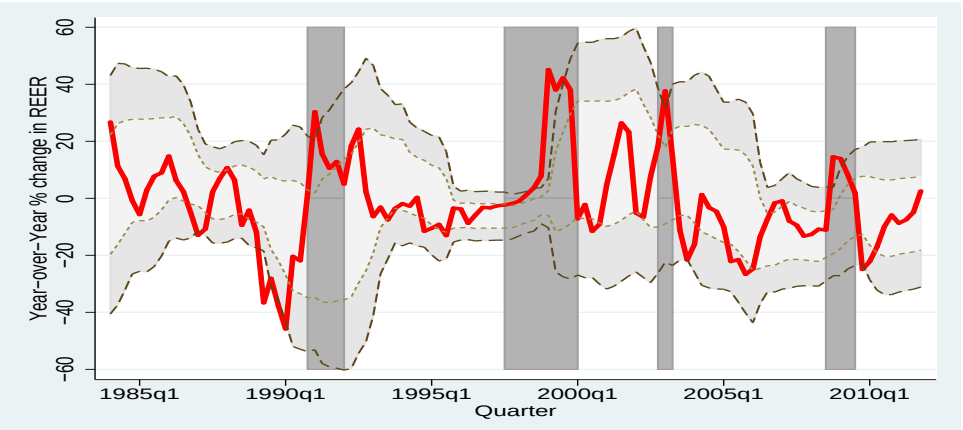
depreciation following the same methodology used for the RER.

Figure 5: ΔRER and depreciation episodes in Brazil (1981-2011)



Figures 5 and 6 portray the cases of abrupt RER and REER depreciation episodes identified for Brazil from 1981 to 2011. Similarly to Figure 1 from the previous section, the solid lines plot $\Delta RERc, q$ and $\Delta REERc, q$, while the dashed and short dashed lines depict the intervals of two and one standard deviations from the moving average, respectively. Over the period, Brazil experienced three abrupt RER depreciation episodes and four abrupt REER depreciations, indicated by the vertical bars in Figures 6 and 5.

Figure 6: ΔREER and depreciation episodes in Brazil (1981-2011)

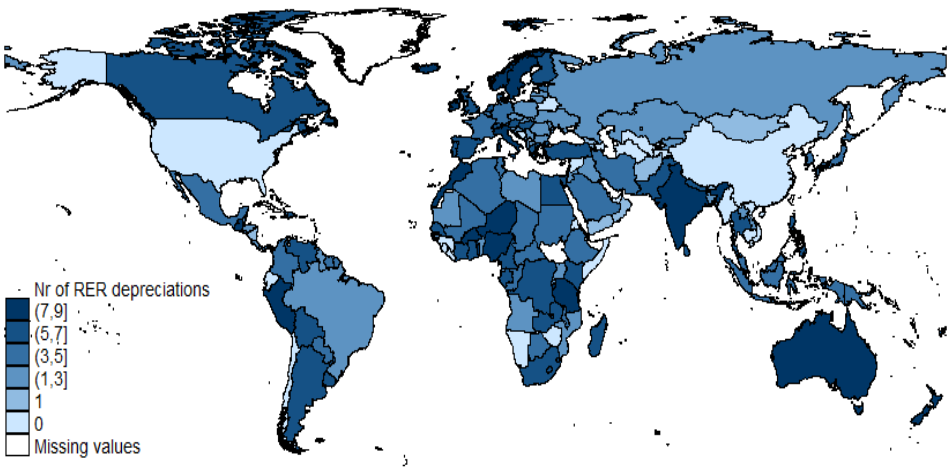


Comparing the two figures, we notice that the real appreciation of the

those of real exchange rates (RER), we compute the year-over-year change of the quarterly REER as $\Delta REER_{c,q} = ln(REER_{c,q-4}/REER_{c,q})$. Consequently, a positive variation of the REER represents a real depreciation of the home country.

Brazilian currency between 1994 and 1995, was not followed by an appreciation of the real effective exchange rate. This event could have had a negative impact on the bilateral trade between Brazil and the US and only a marginal effect on the overall values of imports and exports of the country. Apart from that event, the RER and the REER follow similar patterns.

Figure 7: RER depreciation episodes across countries (1970-2011)



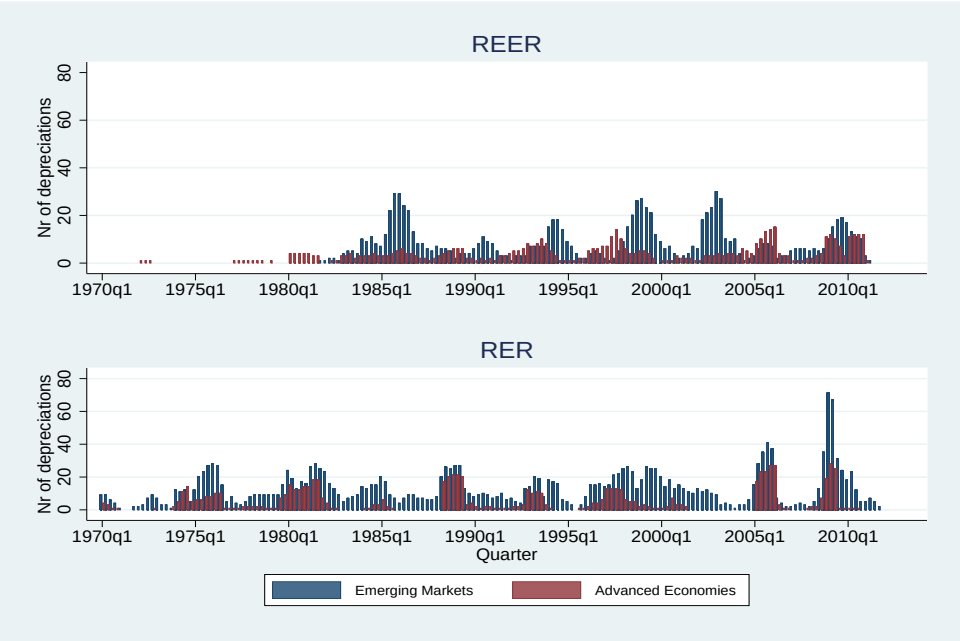
In a broad set of 166 countries, for the period 1970–2011, we find 781 abrupt RER depreciation episodes and 374 for the REER. Figure 7 shows how these episodes are spread across countries, whereas Figure 8 depicts their frequency over time. Comparing the frequency of episodes we see that REER depreciations events are more spread over time (starting from the 1980s) compared to RER depreciations episodes.

The descriptive statistics presented in this section highlight the relatively large frequency of sudden stops and of episodes of abrupt exchange rate depreciations. They also provide motivation for our methodological approach in which we single out these episodes in a cross-section. We turn to describing this methodology next.

3.3 Event-study analysis

Our goal is to identify whether the degree of trade openness of a country has an impact on the relationship between current account and exchange rate changes during episodes of sudden stops and of abrupt exchange rate depreciations. To that end, our approach differs from the literature that studies the probability of occurrence of sudden stops, which relies on panel data analysis where these extreme events are captured by a categorical variable. Part of the empirical literature on currency crisis, on its turn, has also

Figure 8: Frequency of exchange rate depreciation episodes (1970-2011)



used event-study analysis, such as Eichengreen et al. (1995), Reinhart and Kaminsky (1999) and Gourinchas and Obstfeld (2012).

We implement an event-study analysis in which each of the events identified in sections 3.1 and 3.2 represents one observation. The event-study analysis allows us to circumvent the problem related to the identification of all the variables that might affect the relationship between current account and exchange rate changes.[8]

To avoid transitory movements, we add three quarters to each episode window identified, that is, the episode window is $[t_{eb}, t_{ee} + 3]$, where t_{eb} represents the beginning of an episode and t_{ee} its end.[9] The pre-episode horizon is, on its turn, defined as $[t_{eb-1-n}, t_{eb-1}]$, where $n \equiv t_{ee} + 3 - t_{eb}$, so that it includes the same number of quarters as the episode window. This ensures us that we compute the average value of our key variables over two symmetric periods around a sudden stop or an abrupt exchange rate depreciation.

Using the episode and pre-episode windows as explained in the previous paragraph, we compute the changes in current account and trade balance

[8]For discussion on the variables that might affect current account and exchange rate changes see, for example, Calderón and Kubota (2013), Calvo et al. (2004) and Milesi-Ferretti and Razin (2000).

[9]Recall that an episode ends once the change in the variable of interest bounces back within the range of one standard deviation around its mean.

over GDP, as well as the changes in RER and REER, as the difference in (the log of) their averages over the two symmetric intervals around a shock.

3.4 Sources of data

We use quarterly data on exchange rates, current accounts, CPI, imports and exports obtained from the International Monetary Fund's International Financial Statistics (IFS). We compute the changes in these variables following the event study technique previously outlined.

We employ three alternative proxies to compute our main variable of interest, namely, the degree of openness to trade. First, we use a standard measure of openness in the literature, which considers the sum of imports and exports over GDP. This measure, however, is not exactly the definition of openness used in the theoretical model, where we define it as the share of tradables in consumption. Literally, tradable goods should be the sum of all goods that could potentially be exported and the imported goods. We know, however, that there is a big difference between being *potentially* exported, and being *actually* exported. For a potentially exportable good to be exported there are non negligible costs involved, and a fast growing literature, particularly after the influential paper of Melitz (2003), certifies that these fixed costs do prevent a large fraction of tradable goods to be actually traded. The tradable goods in the theoretical model refer to "goods which go easily between [the countries]", again, paraphrasing Ohlin. Hence, the sum of imports and exports is a good proxy for this kind of goods.

Furthermore, the toy model in section 2 actually considers the share of tradables in *consumption*. Thus we employ a second measure of openness defined as the share of imports in total consumption. This measure has been previously employed (see Bussière et al., 2013, for example) and assumes that the domestic economy imports all the tradable goods from abroad and that the degree of openness is given by the ratio between the imported goods and the sum of tradable (imported) and non tradable (domestically produced) goods which can be proxied by the level of aggregate consumption.

Finally, we compute a third measure of openness, which is the ratio of Imports to GDP as in Yanikkaya (2003). Once again, the introduction of this variable as a proxy of openness requires the assumption that the degree of openness in a country is dictated by its imports. It is important to notice that the decision to employ several definitions for openness is driven by the desire to potentially mitigate some of the concerns regarding the difficulty in measuring the degree of trade volumes of a country.

Since the degree of openness to trade might be influenced by the changes in the current account, trade balance and real exchange rates during the episode window of the shocks identified, we need to control for possible endogeneity issues. Our main approach is to look at the lagged value of openness as the average in the year prior to the start of a shock. Our iden-

tification assumes that past levels of openness are unlikely to be strongly correlated to current changes in the current account or trade balance. Similarly, past levels of openness which are rather stable over short time spans are also not expected to play a strong role in the determination of future quarterly fluctuations in exchange rates. Furthermore, we check the robustness of this method by looking at two- and three-year averages prior to the episode year.[10]

Apart from our main variable of trade openness, we control for other factors that are generally recognized to play an important role in the relationship between the current account and exchange rate changes. These include: terms of trade, world export growth, exchange rate flexibility, government debt to GDP, an index of the original sin and one of financial dollarization. The measure of terms of trade used is the annual Net barter terms of trade index provided by the World Bank, interpolated to obtain quarterly data. However, for a large country in the international goods market, changes in trade balance might impact its terms of trade. Again, to avoid endogeneity problems, we compute the average change in the quarterly terms of trade data in the year before the beginning of each shock.

World real exports growth is computed as the year-over-year change in quarterly exports obtained from the International Monetary Fund's International Financial Statistics (IFS). Similarly to the terms of trade measure, we compute its average value in the year before the beginning of each shock. Next, the degree of exchange rate flexibility is obtained from the exchange rate regime classification developed by Reinhart and Rogoff (2004) and updated by Ilzetzki et al. (2008). An higher value of this measure corresponds to more flexible exchange rate regimes.

The fact that governments in emerging markets cannot finance their debt in domestic currency increases their vulnerability to shocks.[11] Moreover, in countries characterized by a positive net foreign currency position (foreign currency assets minus foreign currency liabilities), exchange rate depreciations might deteriorate the current account, instead of improving it, due to its impact of the country's debt burden. Hence, we also control for the

[10] An alternative approach to controlling for the endogeneity of openness to trade is an instrumental variable approach, where trade is instrumented by a gravity equation (see Silva and Tenreyro, 2006, among others). While extensively employed in the literature, this measure is of a static nature since it relies on the distances between countries and other geographical specifications to assess the levels of bilateral trade between countries. This undermines the dynamic nature of trade volumes which play a key function in our analysis. Namely, since countries generally experience several episodes of sudden stops or exchange rate depreciations during the analyzed period, the evolution of openness to trade might be able to capture more accurately the importance of gradually opening ones economy to trade during these extreme episodes.

[11] Tovar (2005) documents that, in Latin America, around two fifths of government bonds have been issued internationally, and virtually none of this is denominated in local currency.

degree of financial dollarization of the country.

More precisely, we add the following explanatory variables: the ratio of government debt over GDP, an index of the original sin and an index of financial dollarization. The gross government debt-to-GDP ratio is obtained from Abbas et al. (2010). Following Hausmann and Panizza (2003), we compute the original sin index (OSIN) of a country as one minus the share of the stock of international securities issued by the country in its own currency. Data for computing the index have been obtained from Fitch Ratings. Finally, the index of financial dollarization has been obtained from Levy Yeyati (2006), who uses data on official credit, cross-border loans, external private and public bonded debt and domestic deposits, to compute the degree of financial dollarization of a country. For all of these three measures, we use their values in the year before the beginning of each episode.

4 Empirical results

We now investigate the impact of trade openness on changes in current account and real exchange rate, as established by equation 14 from our theoretical framework. Notice that the equation establishes the relation between relative prices and changes in current account, but it does not imply causality. In our economy, a liquidity shock generates a change in relative prices so as to achieve the level of tradables consumption compatible with the new current-account balance. Both the current account and the RER are determined simultaneously by the equilibrium conditions of the model.

In the real world, however, other shocks to the economy that affect the exchange rate may occur simultaneously to capital reversals, such as government interventions in the foreign currency market. The exchange rate change, in turn, has an impact on the current account. Hence, reverse causality would be an issue were we use the real exchange rate as the dependent variable in our regressions. For this reason, we look at this question from the opposite perspective, namely, we investigate whether current account reversals are stronger in more open economies, after controlling for RER changes.

We first examine the impact of openness to trade on the relationship between current account and exchange rate changes during episodes of sudden stops. We then consider the same empirical exercise when looking at episodes of abrupt RER and REER depreciations.

4.1 Openness, current account reversals and exchange rates during sudden stops

We first investigate the link between current account/trade balance adjustments, trade openness and exchange rates and during episodes of sudden stops in capital inflows. In this event-study analysis, some countries may

appear more than once if they suffer more than one sudden stop over the time span of our study. Therefore, in all our regressions we relax the assumption of independently distributed error terms across time, allowing the clustering of observations by country. We assume instead that the error term is i.i.d. across countries, but not necessarily so for different observations for the same economy. All reported standard errors are adjusted for clustering.

We check whether openness affects the current account, after controlling for the changes in both RER or REER. We present the results pertaining to RER changes in Table 1. More specifically, Columns (1), (6) and (11) present our baseline regression for each different measure of trade openness employed. We find that the coefficient of openness to trade is always positive and statistically significant across all specifications. This confirms our main hypothesis that, during sudden stop episodes, countries more open to trade experience a larger change in current account to GDP for the same level of real exchange rate depreciation. At the same time, ΔRER is also positive and statistically significant in this baseline estimation, in line with intuition.

Our main result is also also robust to the inclusion of other relevant control variables which can influence the current-account adjustment, such as changes in terms of trade, world exports growth, exchange rate regime and external debt proxies. The coefficient of terms of trade is positive and statistically significant across most specifications, suggesting that improvements in the terms of trade can stimulate current-account reversals. World export growth is generally not significant in these estimations. The same goes for our controls for the level of countries' external indebtedness. The exchange rate regime dummy is negative and significant in most cases, suggesting that economies with less flexible exchange rate regimes might experience higher changes in the current account over GDP when facing a sudden stop.

Finally, we add a dummy variable for emerging markets to capture possible differences between developed and emerging economies. These two types of economies differ in a number of ways, including the level of external debt, risk, trade patterns, among others, which could potentially affect how their current accounts respond to exchange rate changes. We also control for time fixed effects with three decade dummies, for the 1970s, 1980s and 1990s. Results are consistent with the inclusion of these additional robustness checks.

We obtain similar results when controlling for the changes in REER as opposed to RER. We present these estimations in Appendix Table A2. The coefficient of openness to trade is also positive and highly statistically significant across all definitions of openness. Similar to the RER estimations, the changes in REER also have a positive impact on current-account variations, although the coefficient is not very precisely estimated in all specifications. These results are, again, robust to the inclusion of the same set of control variables.

Table 1: Current account and openness during sudden stops

Dependent variable: Changes in current account/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0240**	0.0205*	0.0231*	0.0238	0.0806***										
	(0.010)	(0.012)	(0.012)	(0.018)	(0.017)										
Openness2						0.0506***	0.0692***	0.0532***	0.0662***	0.0983***					
						(0.015)	(0.023)	(0.019)	(0.020)	(0.028)					
Openness3											0.0526***	0.0421*	0.0482**	0.0449	0.1235***
											(0.017)	(0.021)	(0.021)	(0.037)	(0.028)
Δ RER	0.0473**	0.0416	0.0330	0.0055	0.0556	0.0532**	0.0520	0.0448	0.0221	0.0490	0.0471**	0.0362	0.0271	0.0000	0.0484
	(0.022)	(0.033)	(0.032)	(0.042)	(0.045)	(0.022)	(0.038)	(0.040)	(0.043)	(0.046)	(0.021)	(0.032)	(0.031)	(0.043)	(0.043)
Control Variables:															
Δ Terms of Trade		0.1202***	0.1292**	0.0699	0.1394***		0.0870**	0.0653*	0.0561	0.1082**		0.0957**	0.1046**	0.0380	0.1588***
		(0.044)	(0.051)	(0.051)	(0.050)		(0.034)	(0.039)	(0.036)	(0.044)		(0.046)	(0.051)	(0.059)	(0.045)
World Real Export Growth		0.0300	0.0186	0.0389	-0.0106		0.0126	-0.0032	-0.0021	-0.0353		0.0095	-0.0042	0.0114	-0.0099
		(0.026)	(0.025)	(0.027)	(0.043)		(0.025)	(0.023)	(0.022)	(0.042)		(0.029)	(0.029)	(0.034)	(0.041)
IMF Emerging Mkt Dummy		-0.0015	-0.0013	0.0041	0.0190		-0.0012	-0.0027	0.0191*	0.0251*		-0.0015	-0.0016	0.0070	0.0106
		(0.006)	(0.006)	(0.011)	(0.013)		(0.008)	(0.007)	(0.011)	(0.013)		(0.006)	(0.006)	(0.011)	(0.012)
Exchange Rate Regime		-0.0057**					0.0041					-0.0053*			
		(0.003)					(0.004)					(0.003)			
Debt/GDP			-0.0002					-0.0002					-0.0002*		
			(0.000)					(0.000)					(0.000)		
Original Sin				0.0329					0.0948**					0.0376	
				(0.044)					(0.042)					(0.043)	
Financial Dollarization					0.0007					-0.0001					0.0005
					(0.001)					(0.001)					(0.001)
Observations	285	177	178	124	104	195	120	119	98	72	285	178	179	125	104
Nr. of countries	87	79	81	64	47	57	54	54	52	34	88	80	82	65	47
R-squared	0.051	0.087	0.086	0.040	0.176	0.093	0.107	0.110	0.119	0.138	0.076	0.087	0.092	0.035	0.178

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Trade balance and openness during sudden stops

Dependent variable: Changes in trade balance/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0263**	0.0227*	0.0224*	0.0153	0.0753***										
	(0.011)	(0.012)	(0.012)	(0.015)	(0.016)										
Openness2						0.0323**	0.0608***	0.0469**	0.0594***	0.0949***					
						(0.015)	(0.022)	(0.020)	(0.021)	(0.031)					
Openness3											0.0556***	0.0552**	0.0518**	0.0304	0.1105***
											(0.019)	(0.023)	(0.022)	(0.028)	(0.028)
Δ RER	0.0917***	0.1054*	0.0961*	0.0327	0.1108	0.0678*	0.0851	0.0790	0.0209	0.0885	0.0899***	0.1052*	0.0965*	0.0331	0.1040
	(0.032)	(0.056)	(0.055)	(0.040)	(0.084)	(0.035)	(0.066)	(0.066)	(0.038)	(0.086)	(0.033)	(0.055)	(0.055)	(0.040)	(0.081)
Control Variables:															
Δ Terms of Trade		0.2707***	0.2474***	0.2209***	0.2568***		0.2500***	0.2241***	0.2138***	0.3097***		0.2797***	0.2540***	0.2280***	0.2778***
		(0.070)	(0.066)	(0.081)	(0.081)		(0.083)	(0.079)	(0.078)	(0.105)		(0.070)	(0.066)	(0.080)	(0.089)
World Real Export Growth		0.0498	0.0384	0.0636***	0.0164		0.0441*	0.0209	0.0317	-0.0169		0.0489	0.0375	0.0637***	0.0179
		(0.032)	(0.031)	(0.024)	(0.059)		(0.023)	(0.021)	(0.020)	(0.057)		(0.033)	(0.031)	(0.024)	(0.055)
IMF Emerging Mkt Dummy		-0.0060	-0.0049	-0.0060	0.0090		-0.0079	-0.0099	0.0082	0.0079		-0.0095	-0.0079	-0.0063	0.0002
		(0.007)	(0.007)	(0.011)	(0.011)		(0.007)	(0.007)	(0.011)	(0.013)		(0.007)	(0.007)	(0.010)	(0.010)
Exchange Rate Regime		-0.0066**					0.0015					-0.0051*			
		(0.003)					(0.003)					(0.003)			
Debt/GDP			-0.0002					-0.0003					-0.0002		
			(0.000)					(0.000)					(0.000)		
Original Sin				0.0087					0.0757					0.0132	
				(0.048)					(0.046)					(0.049)	
Financial Dollarization					0.0008					0.0006					0.0007
					(0.001)					(0.001)					(0.001)
Observations	287	179	179	125	105	195	120	119	98	72	285	179	179	125	105
Nr. of countries	89	80	81	64	48	57	54	54	52	34	89	80	81	64	48
R-squared	0.058	0.156	0.133	0.114	0.178	0.055	0.143	0.153	0.197	0.177	0.074	0.172	0.149	0.115	0.173

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Trade balance is an important part of the current account, and current-account reversals are achieved mainly through improvements in the trade balance. We thus re-do the empirical investigation using trade balance as dependent variable. The results, presented in Table 2 are qualitatively similar and support our main hypothesis. Furthermore, when controlling for the same additional determinants of trade, we obtain the similar results. Yet, while we note no relevant differences in the ability of openness to impact changes in current account or in trade balance, we do observe that exchange rate changes seem to have a stronger impact on trade balance compared to current account changes. This suggests that the mechanism our estimations capture is mainly obtained through adjustments in trade balance. Again, we check the robustness of these results when controlling for changes in real effective exchange rates as compared to RER. These additional findings are presented in Appendix Table A3 and are qualitatively the same.

Overall, our results show that, during sudden stops, countries more open to trade experience a higher improvement in current account and trade balance, controlling for exchange rate changes. In other words, to achieve the same level of current account or trade balance improvement, a more open economy endures a smaller exchange rate depreciation. This effect is also economically significant. In our sample, the degree of openness to trade varies significantly across countries, with a mean of 64% and a standard deviation of 44%. Given the coefficients presented in column (1) of Tables A2 and A3, a country with a degree of openness equal to the mean will have to depreciate its currency by less than 1% in order to obtain an increase of its current account over GDP equal to 2% (1.5% for the case of trade balance). For countries with a lower degree of openness, say, equal to the 1^{st} quartile (37%), a real exchange rate depreciation of more than 11% is needed in order to obtain the same variation in the current account, and of more than 6.7% for the same change in the trade balance.

Table 3: Current account and openness during RER depreciation episodes

Dependent variable: Changes in current accoumt/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0244***	0.0255***	0.0269***	0.0336**	0.0850***										
	(0.006)	(0.008)	(0.007)	(0.014)	(0.022)										
Openness2						0.0618***	0.0841***	0.0756**	0.0714**	0.1600***					
						(0.022)	(0.031)	(0.029)	(0.032)	(0.044)					
Openness3											0.0580***	0.0557***	0.0588***	0.0817***	0.1590***
											(0.014)	(0.016)	(0.014)	(0.029)	(0.039)
Δ RER	0.0534**	0.0769**	0.0709***	0.0632**	0.0891***	0.0601**	0.0636*	0.0637**	0.0607*	0.0636*	0.0589***	0.0766**	0.0745***	0.0664**	0.0985***
	(0.020)	(0.030)	(0.025)	(0.031)	(0.024)	(0.025)	(0.037)	(0.029)	(0.035)	(0.037)	(0.020)	(0.030)	(0.025)	(0.029)	(0.024)
Control Variables:															
Δ Terms of Trade		0.0939**	0.0758*	0.0919	0.1690**		0.1941**	0.1690*	0.1286	0.1865		0.0926**	0.0747*	0.1018*	0.1897***
		(0.045)	(0.045)	(0.058)	(0.065)		(0.085)	(0.092)	(0.089)	(0.118)		(0.043)	(0.043)	(0.054)	(0.059)
World Real Export Growth		-0.0190	-0.0156	-0.0245	-0.1270		-0.0913	-0.0877	-0.0761	-0.2268		-0.0437	-0.0386	-0.0602	-0.1554
		(0.062)	(0.064)	(0.075)	(0.088)		(0.095)	(0.100)	(0.118)	(0.164)		(0.059)	(0.060)	(0.071)	(0.096)
IMF Emerging Mkt Dummy		0.0178**	0.0163*	0.0029	0.0048		0.0266**	0.0238*	0.0083	-0.0026		0.0137*	0.0123	0.0023	-0.0038
		(0.008)	(0.008)	(0.016)	(0.013)		(0.012)	(0.012)	(0.027)	(0.020)		(0.008)	(0.008)	(0.015)	(0.012)
Exchange Rate Regime		-0.0019					0.0006					-0.0012			
		(0.003)					(0.005)					(0.003)			
Debt/GDP			-0.0003**					-0.0002					-0.0003**		
			(0.000)					(0.000)					(0.000)		
Original Sin				-0.0975*					-0.0816					-0.0776	
				(0.056)					(0.092)					(0.053)	
Financial Dollarization					0.0026***					0.0030***					0.0024***
					(0.001)					(0.001)					(0.001)
Observations	311	182	181	120	92	192	113	111	93	60	313	183	182	121	92
Nr. of countries	93	87	87	68	50	58	58	58	54	34	93	87	87	68	50
R-squared	0.039	0.087	0.109	0.101	0.235	0.067	0.167	0.175	0.128	0.281	0.059	0.103	0.128	0.126	0.256

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

4.2 Openness, current-account reversals and exchange rates during abrupt exchange rate depreciations

We follow the same empirical strategy as in the previous section to study the link between openness and the balance of payments during events of abrupt exchange rate depreciations. Since these events are generally similar or accompanied by sudden stops we expect similar associations between our main variables of interest. Table 3 presents the results of the regressions explaining current-account changes in events of abrupt depreciations in exchange rates. Comparing to the results in Table 1, we notice important similarities. Current-account improvements tend to be larger when real exchange rate depreciations are larger and when the economy is more open to trade. Again, the coefficients of the three measures of openness are positive and highly significant. For abrupt RER depreciation episodes, these effects are significant and robust to the inclusion of similar control variables as in Section 4.1.

Differently from the episodes of sudden stops, however, we now find not only a significant impact of the changes in the terms of trade, but also of the emerging market dummy and the proxies for external debt. We find that countries with higher Debt/GDP or higher debt denominated in foreign currency (Original Sin) are associated with lower current account reversals during episodes of real exchange rate depreciation. However, contrary to our expectations, we find that countries with more foreign currency denominated debt also enjoy larger reversals in current account. This means that the increased interest payments due to the depreciation of the currency is offset by the reversal in trade balance. Finally, we also check the robustness of these results when considering abrupt changes in real effective exchange rates. Results, presented in Appendix Table A4, are qualitatively the same.

Table 4 presents the results obtained under the same specifications as in Table 3, but looking this time at the impact on trade balance variation. Here, again, exchange rate depreciations and openness have a positive and significant impact on trade balance, and this impact is robust to the inclusion of a number of control variables.

We view the evidence presented in this section as complementary to the previous one in highlighting the important role that trade openness might play during extreme events such as sudden stops or abrupt exchange rate depreciations.

Table 4: Trade balance and openness during RER depreciation episodes

Dependent variable: Changes in trade balance/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0248*	0.0355*	0.0346	0.0265**	0.0473**										
	(0.013)	(0.019)	(0.022)	(0.011)	(0.018)										
Openness2						0.0559***	0.0931***	0.0905***	0.0690***	0.1530***					
						(0.019)	(0.029)	(0.028)	(0.023)	(0.049)					
Openness3											0.0796**	0.1024**	0.1039*	0.0825***	0.1197***
											(0.035)	(0.052)	(0.057)	(0.026)	(0.043)
Δ RER	0.0556**	0.0467	0.0294	0.0645***	0.0668***	0.0453	0.0459	0.0490	0.1090***	0.1050***	0.0638**	0.0515	0.0389	0.0706**	0.0757***
	(0.025)	(0.036)	(0.029)	(0.024)	(0.018)	(0.035)	(0.042)	(0.045)	(0.025)	(0.036)	(0.025)	(0.036)	(0.031)	(0.027)	(0.020)
Control Variables:															
Δ Terms of Trade		0.1417***	0.1283***	0.1721**	0.2074***		0.2295**	0.2418**	0.2168*	0.3417*		0.1443***	0.1325***	0.1971***	0.2233***
		(0.039)	(0.036)	(0.070)	(0.059)		(0.104)	(0.120)	(0.110)	(0.175)		(0.039)	(0.036)	(0.071)	(0.060)
World Real Export Growth		0.0312	0.0246	0.0244	-0.0849		-0.0311	-0.0473	-0.0278	-0.1632		0.0274	0.0239	0.0210	-0.0924
		(0.042)	(0.041)	(0.053)	(0.051)		(0.063)	(0.067)	(0.072)	(0.112)		(0.043)	(0.042)	(0.054)	(0.057)
IMF Emerging Mkt Dummy		0.0163*	0.0133	0.0009	-0.0103		0.0175*	0.0199**	-0.0049	-0.0093		0.0103	0.0081	0.0011	-0.0123
		(0.009)	(0.009)	(0.011)	(0.013)		(0.010)	(0.009)	(0.021)	(0.019)		(0.008)	(0.008)	(0.010)	(0.011)
Exchange Rate Regime		-0.0078*					0.0039					-0.0055			
		(0.005)					(0.004)					(0.004)			
Debt/GDP			-0.0002					0.0001					-0.0002		
			(0.000)					(0.000)					(0.000)		
Original Sin				-0.0938**					-0.1023					-0.0764**	
				(0.039)					(0.077)					(0.038)	
Financial Dollarization					0.0034***					0.0036***					0.0033***
					(0.001)					(0.001)					(0.001)
Observations	575	282	280	139	133	210	117	115	94	63	575	282	280	139	133
Nr. of countries	133	118	117	75	67	60	60	60	55	35	133	118	117	75	67
R-squared	0.029	0.138	0.109	0.140	0.231	0.070	0.161	0.158	0.194	0.327	0.072	0.226	0.207	0.181	0.283

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

4.3 Robustness checks

Apart from the use of three alternative proxies for trade openness and the use of both real exchange rates and real effective exchange rates, we perform a series of other robustness checks, in particular with regards to the identification methodology of sudden and abrupt exchange rate depreciations, as well as the specification of the sample.

First, we redefine sudden stops and exchange rate depreciations by looking at both the five years and historical averages as a threshold for identifying the events. This latter method is also employed by Calvo et al. (2004). This alternative identification strategy reduces the number of shocks identified, however it does not significantly impact our main results. We present the results for these robustness checks in Appendix Table A5 for the five year average and in Appendix Table A6 for the historical average, respectively.[12]

Next, we exclude from our sample events that also correspond to banking and currency crisis. We do this by cross checking whether any of the shocks identified using our methodology happen in years in which Laeven and Valencia (2013) identified a banking or a currency crises.

Finally, we re-run our estimations excluding all the sudden stops in which an abrupt depreciation occurred in the quarter before the episode window of such event. We also excluded all depreciations anticipated by a sudden stop. Again, all of these checks do not impact our results quantitatively. The results of the robustness checks have not been included here, but are available upon request.

5 Concluding remarks

We investigate whether openness to trade facilitates current account and trade balance improvements. To this end, we identify events of sudden stops in capital flows and of abrupt exchange rate depreciations and we check whether openness helps explain current account and trade balance improvements.

We present a simple theoretical framework that highlights the mechanism through which openness should affect the relation between current-account changes and real exchange rate depreciation. It should be noted that, according to this simple model, the size of the exchange rate depreciation does not have any impact on welfare. Welfare changes depend on the size of the income shocks that cause the sudden stop, but not on how the economy adapts to it. More specifically, whether the economy adjusts through major relative price changes or through income effects.

In line with the predictions of our theoretical model, we find that the degree of openness has a positive effect on changes in current account and on

[12] We also check the robustness of our results with respect to the variations in trade balance. Results are qualitatively the same and can be obtained from the authors.

trade balance. Our results indicate that more open economies can rebalance their current account and trade balance with smaller domestic currency depreciations after an external shock. Hence, more open economies would be better able to overcome external shocks that entails the need of current-account reversals.

References

Abbas, S., N. Belhocine, A. A. ElGanainy, and M. Horton (2010). A historical public debt database. *IMF Working Papers*, 1–26.

Bianchi, J. (2011). Overborrowing and systemic externalities in the business cycle. *American Economic Review 101*(7), 3400–3426.

Broner, F., T. Didier, A. Erce, and S. L. Schmukler (2013). Gross capital flows: Dynamics and crises. *Journal of Monetary Economics 60*(1), 113–133.

Bussière, M., G. Callegari, F. Ghironi, G. Sestieri, and N. Yamano (2013). Estimating Trade Elasticities: Demand Composition and the Trade Collapse of 2008-2009. *American Economic Journal: Macroeconomics 5*(3), 118–51.

Calderón, C. and M. Kubota (2013). Sudden stops: Are global and local investors alike? *Journal of International Economics 89*(1), 122–142.

Calvo, G. A., A. Izquierdo, and L.-F. Mejia (2004). On the empirics of sudden stops: The relevance of balance-sheet effects. NBER Working Papers 10520, National Bureau of Economic Research, Inc.

Cavallo, E. A. and J. A. Frankel (2008). Does openness to trade make countries more vulnerable to sudden stops, or less? using gravity to establish causality. *Journal of International Money and Finance 27*(8), 1430–1452.

Corsetti, G., P. Martin, and P. Pesenti (2013). Varieties and the transfer problem. *Journal of International Economics 89*(1), 1–12.

Edwards, S. (2004). Financial openness, sudden stops, and current-account reversals. *The American Economic Review 94*(2), 59–64.

Eichengreen, B., A. K. Rose, C. Wyplosz, B. Dumas, and A. Weber (1995). Exchange market mayhem: The antecedents and aftermath of speculative attacks. *Economic Policy 10*(21), pp. 249–312.

Forbes, K. J. and F. E. Warnock (2012). Capital flow waves: Surges, stops, flight, and retrenchment. *Journal of International Economics 88*(2), 235–251. {NBER} Global.

Glick, R. and M. Hutchison (2011). Currency crises. Working Paper Series 2011-22, Federal Reserve Bank of San Francisco.

Gourinchas, P.-O. and M. Obstfeld (2012). Stories of the twentieth century for the twenty-first. *American Economic Journal: Macroeconomics 4*(1), 226–65.

Guidotti, P. E., F. Sturzenegger, A. Villar, J. d. Gregorio, and I. Goldfajn (2004). On the consequences of sudden stops. *Economia 4*(2), 171–214.

Hausmann, R. and U. Panizza (2003). On the determinants of Original Sin: an empirical investigation. *Journal of International Money and Finance 22*(7), 957–990.

Ilzetzki, E., C. Reinhart, and K. Rogoff (2008). Exchange rate arrangements entering the 21st century: Which anchor will hold? *mimeo*.

Keynes, J. M. (1929). The German transfer problem. *The Economic Journal 39*(153), 1–7.

Korinek, A. and E. G. Mendoza (2013). From sudden stops to fisherian deflation: Quantitative theory and policy implications. Working Paper 19362, National Bureau of Economic Research.

Laeven, L. and F. Valencia (2013). Systemic banking crises database. *IMF Economic Review 61*(2), 225–270.

Levy Yeyati, E. (2006). Financial dollarization: evaluating the consequences. *Economic Policy 21*(45), 61–118.

Melitz, M. J. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica 71*(6), 1695–1725.

Mendoza, E. G. (2005). Real exchange rate volatility and the price of nontradable goods in economies prone to sudden stops. *Economia*.

Mendoza, E. G. (2010). Sudden stops, financial crises, and leverage. *American Economic Review 100*(5), 1941–66.

Milesi-Ferretti, G.-M. and A. Razin (2000). Current account reversals and currency crises, empirical regularities. In *Currency Crises*, NBER Chapters, pp. 285–326. National Bureau of Economic Research, Inc.

Obstfeld, M. and K. Rogoff (2007). The unsustainable u.s. current account position revisited. In *G7 Current Account Imbalances: Sustainability and Adjustment*, NBER Chapters, pp. 339–376. National Bureau of Economic Research, Inc.

Obstfeld, M. and K. S. Rogoff (2005). Global current account imbalances and exchange rate adjustments. *Brookings Papers on Economic Activity 36*(1), 67–146.

Ohlin, B. (1929). The reparation problem: a discussion. *Economic Journal 39*(154), 172–182.

Reinhart, C. M. and G. L. Kaminsky (1999). The Twin Crises: The Causes of Banking and Balance-of-Payments Problems. *American Economic Review 89*(3), 473–500.

Reinhart, C. M. and K. S. Rogoff (2004). The modern history of exchange rate arrangements: A reinterpretation. *The Quarterly Journal of Economics 119*(1), 1–48.

Rey, H. and P. Martin (2006). Globalization and emerging markets: With or without crash? *American Economic Review 96*(5), 1631–1651.

Rothenberg, A. D. and F. E. Warnock (2011). Sudden flight and true sudden stops. *Review of International Economics 19*(3), 509–524.

Silva, J. M. C. S. and S. Tenreyro (2006). The Log of Gravity. *The Review of Economics and Statistics 88*(4), 641–658.

Tovar, C. E. (2005). International government debt denominated in local currency: recent developments in latin america. *BIS Quarterly Review, December*.

Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. *Journal of Development Economics 72*(1), 57 – 89.

Appendix Tables

Table A1: Analyzed countries and data availability

Country	Capital Flows	Δ RER	Δ REER	Country	Capital Flows	Δ RER	Δ REER
Afghanistan	–	2005-2011	–	Estonia	1993-2011	1993-2012	–
Albania	1996-2011	1993-2011	–	Ethiopia	1978-2009	1967-2011	–
Algeria	–	1975-2011	1981-2011	Euro Area	2000-2011	–	1981-2011
Angola	–	1993-2011	–	Fiji	2001-2010	1970-2011	1981-2011
Anguilla	–	1999-2011	–	Finland	1976-2011	1966-2012	1968-2011
Antigua and Barbuda	–	–	1977-2011	France	1976-2011	1966-2012	1981-2011
Argentina	1977-2011	1966-2011	–	Gabon	–	1966-2011	1981-2011
Armenia	1994-2011	1994-2011	1995-2011	Gambia, The	2008-2010	1966-2011	1981-2011
Aruba	1987-2010	1987-2011	–	Georgia	1998-2011	1996-2012	1994-2011
Australia	1966-2010	1966-2011	1981-2011	Germany	1972-2011	1966-2012	1976-2011
Austria	1971-2011	1966-2012	1976-2011	Ghana	–	1966-2011	1981-2011
Azerbaijan	2000-2011	–	–	Greece	1977-2011	1966-2012	1981-2011
Bahamas, The	1977-2011	1967-2011	1981-2011	Grenada	–	1977-2011	1977-2011
Bahrain, Kingdom of	–	1967-2011	1981-2011	Guatemala	1978-2011	1966-2011	–
Bangladesh	1977-2011	1994-2011	–	Guinea	–	2005-2011	–
Barbados	–	1966-2011	–	Guinea-Bissau	–	1987-2011	–
Belarus	2003-2011	–	–	Guyana	–	1995-2011	1981-2011
Belgium	2003-2011	1966-2012	1976-2011	Haiti	–	1966-2011	–
Belize	2002-2011	1984-2011	1981-2011	Honduras	2005-2011	1966-2012	–
Benin	–	1993-2011	–	Hungary	1990-2011	1977-2012	1981-2011
Bhutan	–	1980-2010	–	Iceland	1977-2011	1966-2012	1976-2011
Bolivia	1978-2010	1966-2011	1981-2011	India	1976-2010	1966-2011	–
Bosnia and Herzegovina	2002-2011	2007-2011	–	Indonesia	1982-2011	1969-2012	–
Botswana	–	1975-2011	–	Iran, Islamic Republic of	–	1966-2011	1976-2011
Brazil	1976-2011	1981-2012	1981-2011	Iraq	–	1966-2011	–
Brunei Darussalam	2003-2009	1985-2011	–	Ireland	1982-2011	1966-2012	1976-2011
Bulgaria	1993-2011	1992-2012	1993-2011	Israel	1973-2011	1966-2012	1976-2011
Burkina Faso	–	1966-2011	–	Italy	1971-2011	1966-2012	1981-2011
Burundi	–	1966-2011	1976-2011	Jamaica	–	1966-2012	–
Cambodia	1995-2010	1995-2011	–	Japan	1978-2011	1966-2011	1981-2011
Cameroon	1980-1987	1969-2011	1981-2011	Jordan	1978-2011	1977-2012	–
Canada	1966-2011	1966-2011	1976-2011	Kazakhstan	1996-2011	1994-2012	–
Cape Verde	1999-2011	1985-2012	–	Kenya	–	1966-2012	–
Central African Rep.	–	1982-2010	1981-2011	Korea, Republic of	1977-2011	1971-2012	–
Chad	–	1984-2010	–	Kosovo	2010-2011	–	–
Chile	1992-2011	–	1981-2011	Kuwait	–	1974-2011	–
China, P.R.: Hong Kong	2000-2011	1981-2011	–	Kyrgyz Republic	1996-2011	1996-2011	–
China, P.R.: Macao	–	1989-2011	–	Lao, P.D.R.	1995-2010	1989-2010	–
China, P.R.: Mainland	2011-2011	–	1981-2011	Latvia	1994-2011	1993-2012	–
Colombia	1997-2011	1966-2012	1981-2011	Lebanon	2003-2010	–	–
Congo, Dem. Rep. of	–	1966-2009	1981-2010	Lesotho	1986-2007	1974-2011	1976-2011
Congo, Republic of	–	1991-2010	–	Libya	–	1966-2011	–
Costa Rica	2000-2011	1966-2011	1981-2011	Lithuania	1994-2011	1993-2012	–
Cote d'Ivoire	–	1966-2011	1981-2011	Luxembourg	1996-2011	1966-2012	1976-2011
Croatia	1994-2011	1993-2012	1993-2011	Macedonia, FYR	1997-2010	1994-2012	1993-2011
Cyprus	2002-2011	1966-2012	1981-2011	Madagascar	2004-2005	1966-2011	–
Czech Republic	1994-2011	1994-2012	1991-2011	Malawi	–	1981-2011	1981-2011
Czechoslovakia	1990-1992	–	–	Malaysia	2000-2010	1966-2011	1976-2011
Denmark	1976-2011	1966-2012	1976-2011	Maldives	–	2005-2011	–
Djibouti	–	1982-2011	–	Mali	–	1988-2011	–
Dominica	–	1966-2011	1976-2011	Malta	1996-2011	1966-2011	1976-2011
Dominican Republic	–	1966-2012	1981-2011	Mauritania	–	1986-2011	–
Ecuador	1994-2011	–	1981-2011	Mauritius	2001-2010	1966-2012	–
Egypt	–	1966-2011	–	Mexico	1980-2011	1966-2012	1981-2011
El Salvador	2000-2011	1966-2012	–	Moldova	1995-2011	1995-2011	1995-2011
Equatorial Guinea	–	1986-2008	1986-2011	Mongolia	2005-2010	1992-2011	–
Eritrea	1999-2000	–	–	Montenegro, Republic of	–	2006-2011	–

Country	Capital Flows	Δ RER	Δ REER	Country	Capital Flows	Δ RER	Δ REER
Morocco	2004-2010	1966-2011	1981-2011	Slovak Republic	1994-2010	1994-2012	1991-2011
Mozambique	2000-2010	1993-2011	–	Slovenia	1993-2011	1993-2012	–
Myanmar	1977-2011	1971-2011	–	Solomon Islands	2007-2010	1971-2011	1979-2011
Namibia	2000-2010	2003-2012	–	South Africa	1966-2011	1966-2012	1976-2011
Nepal	1978-2010	1966-2011	–	Spain	1976-2011	1966-2012	1981-2011
Netherlands	1968-2011	1966-2012	1976-2011	Sri Lanka	1978-2010	1966-2011	–
Netherlands Antilles	1999-2010	1969-2010	1976-2010	St. Kitts and Nevis	–	1980-2011	1976-2011
New Zealand	1981-2011	1966-2011	1976-2011	St. Lucia	–	1966-2011	1976-2011
Nicaragua	1994-2011	2000-2012	1981-2011	St. Vinc. and the Gren.	–	1976-2011	1976-2011
Niger	–	1969-2011	–	Sudan	1978-2010	1966-2011	–
Nigeria	1991-1994	1966-2011	1981-2011	Suriname	1978-2010	1966-2011	–
Norway	1976-2011	1966-2012	1976-2011	Swaziland	–	1966-2011	–
Oman	–	2002-2011	–	Sweden	1976-2011	1966-2012	1976-2011
Pakistan	1977-2011	1966-2011	1981-2011	Switzerland	2000-2011	1966-2012	1976-2011
Panama	1999-2011	1966-2011	–	Tajikistan	2003-2010	–	–
Papua New Guinea	1977-2001	1972-2011	1981-2011	Tanzania	–	1970-2012	–
Paraguay	2002-2011	1966-2011	1981-2011	Thailand	1977-2011	1966-2012	–
Peru	1978-2011	1966-2012	–	Togo	–	1971-2011	1981-2011
Philippines	1978-2011	1966-2012	1976-2011	Tonga	1978-2010	1977-2011	–
Poland	1986-2011	1981-2012	1981-2011	Trinidad and Tobago	–	1966-2011	1976-2011
Portugal	1976-2011	1966-2012	1976-2011	Tunisia	–	1988-2011	1976-2011
Qatar	–	2004-2012	–	Turkey	1985-2011	1970-2012	–
Romania	1992-2011	1991-2012	1981-2011	Uganda	1981-2010	1982-2012	1981-2011
Russian Federation	1995-2011	1993-2011	1995-2011	Ukraine	1995-2011	1993-2012	1993-2011
Rwanda	–	1966-2012	–	United Kingdom	1971-2011	1966-2012	1976-2011
Samoa	2004-2011	1966-2011	1976-2011	United States	1974-2011	1966-2012	1981-2011
San Marino	–	2004-2010	–	Uruguay	2001-2010	1966-2011	1981-2011
Saudi Arabia	2007-2011	1972-2011	1981-2011	Vanuatu	1985-2008	1977-2011	–
Senegal	–	1969-2011	–	Venezuela, Rep. Boliv.	1995-2011	1966-2011	1981-2011
Serbia, Republic of	2009-2011	1998-2011	–	Vietnam	–	1996-2011	–
Seychelles	1980-2011	1970-2011	–	Yemen, Republic of	2001-2010	1998-2011	–
Sierra Leone	–	–	1981-2011	Zambia	–	1986-2011	1981-2011
Singapore	1996-2010	1966-2011	1976-2011	Zimbabwe	1982-1994	–	–

Table A2: Current account and openness during sudden stops: REER estimations

Dependent variable: Changes in current account/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0194***	0.0228***	0.0231***	0.0294**	0.0389										
	(0.006)	(0.008)	(0.008)	(0.012)	(0.024)										
Openness2						0.0310***	0.0420**	0.0316*	0.0336**	0.0558**					
						(0.010)	(0.017)	(0.016)	(0.015)	(0.022)					
Openness3											0.0391***	0.0435***	0.0442***	0.0441	0.0720
											(0.011)	(0.016)	(0.015)	(0.029)	(0.048)
Δ REER	0.0634	0.1049**	0.1005*	0.0703	0.1083	0.0798	0.1308***	0.1344**	0.1041	0.1498**	0.0625	0.0922*	0.0848	0.0398	0.1026
	(0.043)	(0.048)	(0.050)	(0.076)	(0.083)	(0.053)	(0.045)	(0.053)	(0.069)	(0.058)	(0.041)	(0.048)	(0.051)	(0.078)	(0.083)
Control Variables:															
Δ Terms of Trade		0.0700	0.0618	0.0770	0.0589		0.0906	0.0917	0.0956	0.1369		0.0295	0.0158	0.0070	0.0796
		(0.044)	(0.049)	(0.057)	(0.050)		(0.058)	(0.063)	(0.065)	(0.096)		(0.058)	(0.063)	(0.079)	(0.060)
World Real Export Growth		0.0100	0.0061	0.0100	-0.0092		-0.0081	-0.0076	-0.0085	-0.0397		-0.0185	-0.0247	-0.0252	-0.0164
		(0.018)	(0.018)	(0.022)	(0.047)		(0.019)	(0.022)	(0.022)	(0.046)		(0.024)	(0.025)	(0.030)	(0.046)
IMF Emerging Mkt Dummy		-0.0076	-0.0079	-0.0057	0.0124		-0.0080	-0.0091	-0.0021	0.0114		-0.0063	-0.0072	0.0015	0.0093
		(0.006)	(0.006)	(0.010)	(0.012)		(0.008)	(0.008)	(0.011)	(0.010)		(0.007)	(0.007)	(0.012)	(0.011)
Exchange Rate Regime		-0.0008					0.0042					-0.0005			
		(0.002)					(0.003)					(0.002)			
Debt/GDP			-0.0000					-0.0000					-0.0001		
			(0.000)					(0.000)					(0.000)		
Original Sin				0.0100					0.0325					0.0278	
				(0.049)					(0.050)					(0.053)	
Financial Dollarization					0.0009					0.0004					0.0007
					(0.001)					(0.001)					(0.001)
Observations	184	111	110	84	54	145	84	83	73	40	185	112	111	85	54
Nr. of countries	59	55	55	47	28	45	42	42	41	22	60	56	56	48	28
R-squared	0.052	0.117	0.111	0.079	0.095	0.084	0.198	0.172	0.118	0.234	0.061	0.113	0.113	0.059	0.107

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Trade balance and openness during sudden stops

Dependent variable: Changes in trade balance/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0237**	0.0256**	0.0243**	0.0200*	0.0529**										
	(0.009)	(0.010)	(0.010)	(0.011)	(0.020)										
Openness2						0.0114	0.0280*	0.0245	0.0214	0.0607**					
						(0.010)	(0.015)	(0.015)	(0.014)	(0.022)					
Openness3											0.0505***	0.0644***	0.0632***	0.0424*	0.1159***
											(0.017)	(0.024)	(0.022)	(0.024)	(0.030)
Δ REER	0.0584	0.1090*	0.1036	0.1213*	0.0696	0.0629	0.1342***	0.1331***	0.1092*	0.1337**	0.0612	0.1043*	0.1022*	0.1194*	0.0679
	(0.048)	(0.059)	(0.062)	(0.065)	(0.116)	(0.053)	(0.040)	(0.044)	(0.060)	(0.049)	(0.046)	(0.055)	(0.059)	(0.063)	(0.111)
Control Variables:															
Δ Terms of Trade		0.1820**	0.1576*	0.2358***	0.1138		0.1951***	0.1919***	0.1958***	0.2632***		0.2016***	0.1803**	0.2475***	0.1537*
		(0.071)	(0.079)	(0.073)	(0.086)		(0.040)	(0.040)	(0.046)	(0.071)		(0.069)	(0.077)	(0.071)	(0.080)
World Real Export Growth		0.0477*	0.0409*	0.0437**	0.0493		0.0231	0.0223	0.0204	0.0029		0.0413*	0.0363*	0.0426*	0.0354
		(0.024)	(0.022)	(0.022)	(0.068)		(0.015)	(0.018)	(0.017)	(0.032)		(0.023)	(0.021)	(0.022)	(0.065)
IMF Emerging Mkt Dummy		-0.0109	-0.0100	-0.0161	0.0105		-0.0122*	-0.0125	-0.0121	-0.0002		-0.0154*	-0.0146*	-0.0166	0.0085
		(0.008)	(0.008)	(0.012)	(0.013)		(0.007)	(0.008)	(0.010)	(0.011)		(0.008)	(0.008)	(0.012)	(0.013)
Exchange Rate Regime		-0.0003					0.0013					0.0011			
		(0.003)					(0.003)					(0.003)			
Debt/GDP			-0.0001					-0.0000					-0.0001		
			(0.000)					(0.000)					(0.000)		
Original Sin				-0.0169					0.0049					-0.0086	
				(0.053)					(0.051)					(0.055)	
Financial Dollarization					0.0001					0.0002					-0.0004
					(0.001)					(0.001)					(0.001)
Observations	186	113	111	85	54	145	84	83	73	40	186	113	111	85	54
Nr. of countries	60	56	55	47	28	45	42	42	41	22	60	56	55	47	28
R-squared	0.038	0.108	0.104	0.179	0.073	0.042	0.283	0.255	0.204	0.403	0.052	0.142	0.145	0.184	0.106

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Current account and openness during REER depreciation episodes

Dependent variable: Changes in current accoumt/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0212**	0.0191*	0.0249*	0.0134	0.0323*										
	(0.009)	(0.010)	(0.013)	(0.009)	(0.016)										
Openness2						0.0380**	0.0437*	0.0456**	0.0362	0.0950					
						(0.018)	(0.023)	(0.021)	(0.023)	(0.069)					
Openness3											0.0511***	0.0503***	0.0571***	0.0412**	0.0720*
											(0.013)	(0.013)	(0.013)	(0.019)	(0.036)
Δ REER	0.1207***	0.1089***	0.0890***	0.0790**	0.0938	0.0987***	0.1045*	0.0926*	0.0643	0.1686*	0.1196***	0.1032***	0.0931***	0.0768**	0.1024*
	(0.030)	(0.036)	(0.032)	(0.036)	(0.058)	(0.033)	(0.056)	(0.051)	(0.054)	(0.094)	(0.027)	(0.035)	(0.032)	(0.030)	(0.056)
Control Variables:															
Δ Terms of Trade		0.0912**	0.0933**	0.1242***	0.1004*		0.0796	0.0714	0.0972	0.0875		0.1016***	0.1011**	0.1309***	0.1148**
		(0.037)	(0.040)	(0.041)	(0.053)		(0.061)	(0.071)	(0.098)	(0.064)		(0.036)	(0.039)	(0.043)	(0.048)
World Real Export Growth		-0.0447	-0.0613	-0.0544	-0.0829		-0.0386	-0.0456	-0.0451	-0.0849		-0.0486	-0.0594	-0.0519	-0.0804
		(0.039)	(0.040)	(0.040)	(0.146)		(0.052)	(0.053)	(0.051)	(0.214)		(0.038)	(0.040)	(0.039)	(0.144)
IMF Emerging Mkt Dummy		0.0115*	0.0107	-0.0061	0.0067		0.0087	0.0081	-0.0013	0.0065		0.0084	0.0071	-0.0064	0.0066
		(0.007)	(0.007)	(0.011)	(0.009)		(0.008)	(0.009)	(0.013)	(0.019)		(0.006)	(0.006)	(0.011)	(0.009)
Exchange Rate Regime		-0.0061**					-0.0021					-0.0035			
		(0.003)					(0.003)					(0.002)			
Debt/GDP			-0.0000					-0.0000					-0.0001		
			(0.000)					(0.000)					(0.000)		
Original Sin				-0.0673					-0.0514					-0.0613	
				(0.049)					(0.048)					(0.048)	
Financial Dollarization					0.0005					0.0004					0.0004
					(0.001)					(0.002)					(0.001)
Observations	193	128	126	100	57	139	90	88	79	41	193	128	126	100	57
Nr. of countries	62	61	61	53	28	43	43	43	42	19	62	61	61	53	28
R-squared	0.098	0.180	0.164	0.147	0.137	0.055	0.092	0.090	0.085	0.177	0.151	0.219	0.216	0.170	0.146

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Current account and openness during sudden stops (5 years average) estimations

Dependent variable: Changes in current account/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0231**	0.0206	0.0246*	0.0263	0.0671***										
	(0.011)	(0.013)	(0.014)	(0.019)	(0.020)										
Openness2						0.0504***	0.0635**	0.0497**	0.0653***	0.0872***					
						(0.018)	(0.024)	(0.019)	(0.021)	(0.030)					
Openness3											0.0552***	0.0542**	0.0612**	0.0711	0.1105***
											(0.020)	(0.025)	(0.026)	(0.043)	(0.031)
Δ RER	0.0515*	0.0865**	0.0790**	0.0518	0.0628	0.0590**	0.0635	0.0623	0.0456	0.0604	0.0550**	0.0837**	0.0772**	0.0497	0.0618*
	(0.027)	(0.037)	(0.039)	(0.047)	(0.037)	(0.023)	(0.038)	(0.039)	(0.039)	(0.039)	(0.026)	(0.035)	(0.036)	(0.043)	(0.035)
Control Variables:															
Δ Terms of Trade		0.1059***	0.1188**	0.0675	0.1431**		0.0742**	0.0246	0.0633	0.1066**		0.1133***	0.1257***	0.0979*	0.1605***
		(0.038)	(0.046)	(0.048)	(0.058)		(0.034)	(0.041)	(0.038)	(0.045)		(0.035)	(0.042)	(0.051)	(0.052)
World Real Export Growth		0.0261	0.0151	0.0330	-0.0302		0.0083	-0.0143	-0.0092	-0.0666		0.0266	0.0161	0.0420	-0.0275
		(0.030)	(0.029)	(0.034)	(0.046)		(0.031)	(0.032)	(0.026)	(0.053)		(0.030)	(0.031)	(0.034)	(0.044)
IMF Emerging Mkt Dummy		0.0028	0.0036	0.0052	0.0072		0.0029	0.0012	0.0203	0.0155		-0.0005	-0.0002	0.0038	0.0010
		(0.008)	(0.008)	(0.014)	(0.014)		(0.009)	(0.009)	(0.013)	(0.014)		(0.008)	(0.008)	(0.013)	(0.013)
Exchange Rate Regime		-0.0070**					0.0025					-0.0053*			
		(0.003)					(0.004)					(0.003)			
Debt/GDP			-0.0001					-0.0004*					-0.0001		
			(0.000)					(0.000)					(0.000)		
Original Sin				0.0219					0.0953*					0.0385	
				(0.051)					(0.051)					(0.049)	
Financial Dollarization					0.0011					0.0007					0.0010
					(0.001)					(0.001)					(0.001)
Observations	233	165	164	117	97	163	109	107	91	68	233	165	164	117	97
Nr. of countries	83	77	77	62	46	56	51	51	49	33	83	77	77	62	46
R-squared	0.049	0.108	0.090	0.050	0.144	0.091	0.108	0.127	0.118	0.117	0.081	0.135	0.125	0.083	0.157

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Current account and openness during sudden stops (5 years average) estimations

Dependent variable: Changes in current account/GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Openness1	0.0187*	0.0146	0.0198	0.0161	0.0686***										
	(0.011)	(0.017)	(0.017)	(0.018)	(0.017)										
Openness2						0.0440**	0.0519*	0.0403*	0.0505*	0.0864**					
						(0.017)	(0.026)	(0.020)	(0.027)	(0.036)					
Openness3											0.0550**	0.0528	0.0616*	0.0461	0.1387***
											(0.022)	(0.036)	(0.035)	(0.042)	(0.029)
Δ RER	0.0800***	0.1139***	0.0957***	0.0969**	0.0672**	0.0788***	0.0924**	0.0888**	0.0979***	0.0770**	0.0864***	0.1161***	0.1038***	0.0929**	0.0847***
	(0.021)	(0.036)	(0.033)	(0.038)	(0.031)	(0.021)	(0.037)	(0.033)	(0.033)	(0.029)	(0.022)	(0.036)	(0.033)	(0.037)	(0.031)
Control Variables:															
Δ Terms of Trade		0.1225***	0.1192**	0.1236**	0.1485***		0.0402	0.0076	0.0330	0.0804		0.1544**	0.1505**	0.1025**	0.2242***
		(0.041)	(0.047)	(0.056)	(0.052)		(0.047)	(0.058)	(0.054)	(0.066)		(0.060)	(0.063)	(0.048)	(0.071)
World Real Export Growth		-0.0031	-0.0136	-0.0088	0.0062		0.0088	-0.0040	-0.0022	-0.0503		-0.0207	-0.0296	-0.0293	-0.0044
		(0.029)	(0.029)	(0.035)	(0.053)		(0.034)	(0.035)	(0.034)	(0.045)		(0.032)	(0.033)	(0.039)	(0.051)
IMF Emerging Mkt Dummy		0.0016	0.0035	-0.0034	0.0086		0.0025	-0.0006	0.0074	0.0148		-0.0018	-0.0011	-0.0020	-0.0020
		(0.009)	(0.009)	(0.012)	(0.014)		(0.008)	(0.008)	(0.012)	(0.016)		(0.009)	(0.009)	(0.012)	(0.013)
Exchange Rate Regime		-0.0087*					0.0006					-0.0060			
		(0.005)					(0.005)					(0.005)			
Debt/GDP			-0.0002					-0.0003*					-0.0002		
			(0.000)					(0.000)					(0.000)		
Original Sin				-0.0466					0.0211					-0.0393	
				(0.049)					(0.061)					(0.049)	
Financial Dollarization					0.0019*					0.0013					0.0021*
					(0.001)					(0.001)					(0.001)
Observations	291	176	174	125	93	180	111	108	95	66	293	178	176	126	94
Nr. of countries	84	72	73	59	45	56	48	48	46	34	85	73	74	59	46
R-squared	0.051	0.115	0.101	0.077	0.202	0.098	0.128	0.133	0.108	0.169	0.079	0.143	0.140	0.086	0.296

Openness1 is measured as the ratio of exports plus imports to GDP, Openness2 as the share imports in total consumption, while Openness3 is the ratio of imports to GDP. Decades dummies (except in Columns (1), (6) and (11)) and a constant term are included but not reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

PARIS

ESSEC Business School
3, avenue Bernard-Hirsch
CS 50105 Cergy
95021 Cergy-Pontoise Cedex
France
Tél. +33 (0)1 34 43 30 00
www.essec.fr

ESSEC Executive Education
CNIT BP 230
92053 Paris-La Défense
France
Tél. +33 (0)1 46 92 49 00
www.executive-education.essec.fr

ESSEC Asia Pacific
2 One-North Gateway
Singapore 138502
Tél. +65 6884 9780
www.essec.edu/asia

SINGAPOUR

Contact :

Centre de Recherche
+33 (0)1 34 43 30 91
research.center@essec.fr

AACSB ACCREDITED
EFMD EQUIS ACCREDITED
affilié à la CCI PARIS ILE-DE-FRANCE

ESSEC BUSINESS SCHOOL