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Can countries rely on foreign saving for investment and economic development?

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Abstract Contrary to widespread presumption, a surprisingly large number of countries have been able to finance a significant fraction of their investment for extended periods using foreign finance. While many of these episodes are in countries where official finance is important, we also identify episodes where a substantial fraction of domestic investment is financed by private capital inflows. Although there is evidence of a positive growth effect of such inflows in the short run, that positive impact dissipates after 5 years and turns negative over longer horizons. Many such episodes end abruptly, with compression of the current account and sharp slowdowns in investment and growth. Summing over the inflow (current account deficit) episode and its aftermath, we find that growth is slower than when countries rely on domestic savings. The implication is that financing growth and investment out of foreign savings, while not impossible, is risky and too often counterproductive.

Keywords Current account · Growth · Volatility · Savings

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1 Introduction

Financially open economies can in principle invest more than they save by tapping foreign finance. In theory, a poor country with a low saving rate but good growth prospects can build up its capital stock by running large and sustained current account deficits. The question is whether this approach to fostering development and growth is feasible and productive in practice.

Skeptics question the advisability of relying on foreign finance in good times and bad. In good times, when foreign funding is freely available, capital inflows may lead to resource misalloation, as funding becomes available to less efficient projects and firms and as the associated consumption boom causes resources to be reallocated to the nontradables sector. In bad times, when foreign finance dries up, the country on the receiving end is then forced to undertake a painful and dangerous adjustment. According to urban legend, the IMF has long regarded current account deficits greater than 4% of GDP as a danger sign: deficits above this threshold indicate that a country is exposing itself to the risk of a current account reversal and growth collapse when the capital inflow that financed the deficit comes to a sudden stop.[1] Aware of the risks, investors will be reluctant to finance current account deficits that persistently exceed this threshold. Countries seeking to build up their capital stocks therefore must and, indeed, should rely on domestic savings to finance domestic investment. The point is often thought be epitomized by China, which has more than fully financed exceptionally high investment rates out of high domestic savings and thereby sustained near-double-digit growth for three decades. Such is the conventional wisdom, in other words.

Our analysis supports one part of this conventional wisdom but not the other. Contrary to the received wisdom, we identify a substantial number of countries that have been able to run current account deficits in excess of 4% of GDP for periods as long as 10 years. It has been possible, in other words, for countries to finance a significant portion of domestic investment out of foreign saving, contrary to popular presumption.

To be sure, a substantial number of these episodes are in Sub-Saharan Africa, where official finance has been more important than private finance. Official finance tends to be larger, relative to both private capital flows and the size of the recipient country, and more stable, given its sources and motivations. However, in a significant number of other episodes, large and persistent current account deficits have been financed with private capital inflows, of foreign direct investment in particular.

But how do large and persistent current account deficit episodes end? Here our results are more consistent with the conventional wisdom: typically they do not end

[1] See for example, Fischer (1988, 1994, 2003) for warnings on the risks associated with large current account deficits.

happily. Instead they end abruptly, with compression of the current account, real exchange rate depreciation, and a sharp drop in investment.

We show that large and persistent deficit episodes are characterized by above-average growth in the first 4 to 5 years. However, this positive impact dissipates after 5 years. Over a 20-year period, the cumulative growth effect turns negative.[2] In addition, periods following large and persistent current account deficit episodes are characterized by unusually severe output volatility. We conclude that financing growth and investment out of foreign savings is not impossible, but it is risky and does not yield a clear growth dividend.[3]

Our findings relate to four kindred literatures. First, there is research on the relationship between saving and investment adopting the pioneering approach of Feldstein and Horioka (1980) but analyzing data for more recent periods. (The subsequent literature is large: for a survey see Apergis and Tsouimas 2009.) These studies show that the tight correlation between domestic saving and investment found in the original Feldstein-Horioka study loosened after the authors wrote their seminal piece, as international financial markets developed further and governments relaxed and, in the limit, removed their capital controls.

Second, there is the literature on the years before 1913, when the savings-investment correlation was also looser than in the third quarter of the twentieth century, and when late-developing countries like Canada, Australia and Argentina relied very substantially on foreign savings for domestic investment. Bayoumi (1990) and Taylor (1994) show that data like those used by Feldstein and Horioka look very different in this earlier period. Schularick and Steger (2010) show that countries relying most heavily on foreign saving for investment grew most rapidly in this period. Fishlow (1985) and Eichengreen (1985) observe that much of the investment financed with foreign capital was in infrastructure and tradable-goods capacity where it could be used to generate the exports needed to service the additional external debt, and that borrowing took place in a setting characterized by strong political ties between the lenders (often European) and borrowers (often overseas regions of recent European settlement).[4]

Third, there is the literature on lending booms and sudden stops, which highlights the risks of heavy reliance on private capital inflows (Calvo et al. 2004; Cavallo and Frankel 2008). Sudden stops are when foreign investors curtail their purchases of domestic assets and/or local investors engage in capital flight. By definition, they reduce or eliminate the external financing available to countries that previously invested more than they saved, requiring the affected country to eliminate its current account deficit abruptly. This adjustment is usually accomplished through a combination of real exchange rate depreciation and import contraction, both of which are often associated with recession. Real depreciation can be disruptive

[2] Although the difference in long-run growth between episodes and non-episodes is not always statistically significant.

[3] Reinhart and Trebesch (2015) suggest that Greece's long history of debt crisis is a classic example of the pitfalls of relying on external financing.

[4] Adalet and Eichengreen (2007) document that current account reversals were relatively few before 1914, compared to the last quarter of the 20th century. This speaks to the third related literature considered in the next paragraph.

because it raises the cost of servicing foreign-currency-denominated debt, triggering bankruptcies that create output costs. Import compression is achieved through expenditure-reducing policies that typically also reduce output and employment. For all these reasons, sudden stops are costly in terms of output. At the same time, there is also a related literature documenting that not all externally-financed lending booms end in sudden stops and hard landings (see e.g. Gourinchas et al. 2001), and some work suggesting that even when they do the net growth effects remain positive (Tornell and Westermann 2002; Ranciere et al. 2006).

Complementing the literature on sudden stops is research on "current account reversals" (i.e., Milesi Ferretti and Razin 2000; Edwards 2004; Adalet and Eichengreen 2007; Freund and Warnock 2007). Contributors ask whether countries can avoid disruptive current account reversals by strengthening their macroeconomic fundamentals. They establish that countries with weak macroeconomic frameworks are more likely to experience current account reversals. In the paper closest to our own, Edwards (2004) analyzes a data set for 157 countries covering the period 1970–2001. He finds that large current account deficits are typically limited in duration; financing them for extended periods is problematic. In addition, he finds that the probability of a reversal can be predicted by a relatively small number a of variables, including a country's (lagged) current account to GDP ratio, the external debt to GDP ratio, the level of international reserves, domestic credit growth, and the debt-service ratio.

A fourth and final literature considers implications for growth of capital inflows and their termination. Prasad et al. (2007) study the growth experience of countries that rely on foreign finance for investment. They conclude that developing countries have limited absorptive capacity, whether because their financial markets are underdeveloped or because their exchange rates are prone to overvaluation in the event of large capital inflows, excessive consumption growth, or a combination of these factors.[5] Gopinath et al. (2016) focus on capital inflows into Southern Europe following the advent of the euro and show that the short-term boost to growth was swamped by the longer-term negative effects of resource misallocation. Blanchard (2007) and Benigno and Fornaro (2014) all provide detailed analyses of Portugal, again showing that the loosening of external financial constraints following euro adoption was associated with stagnant productivity and ultimately negative impacts on growth. The conclusions of these studies of the recent period are in striking contrast to those of Schularick and Steger (referenced above) for the years before 1913. Moreover, these studies of recent experience generally focus only on a relatively small subset of countries (sometimes as few as one), so their generality is not established.

Establishing it is our goal in this paper. We do so by analyzing data for the population of developing countries and emerging markets over the entire period 1970–2013, a larger panel than considered in previous work. We provide a new and more precise definition of "large and persistent current account deficits" and use that definition to construct a treatment group of episodes, behavior in which we then

[5] See also Reisen (1997) and Bussière and Fratzscher (2008) on the complex interrelationships between foreign savings, financial openness, stability and growth.

Table 1 Number of observations

	1970	1980	1990	2000	2010
SSA	1	32	38	35	35
Asia		11	15	18	19
MNA	1	13	13	13	16
LAC	4	26	25	27	27
EME		1	4	23	24
AE	4	24	23	24	24
Total	14	107	118	140	145

compare with that in a matching set of control-group cases. We vary the thresholds used in constructing our deficit measure and establish the robustness of our results with respect to a large range of alternative thresholds. The analysis establishes more definitively than before which part of the conventional wisdom regarding large and persistent current account deficits survives, and which part does not.

2 Large and persistent current account deficits

Our sample includes 24 advanced and 121 developing and emerging market countries. Of the developing countries, 35 are in Sub-Saharan African, 27 in Latin America and the Caribbean, 24 in Emerging Europe, 19 in Asia, and 16 in the Middle East and North Africa region (Table 1). In 1975 we have data for only 54 countries (19 advanced economies, 13 in Sub-Saharan Africa and 10 in Latin America and Caribbean). Only after 1978 are there more than 100 countries in the sample.

We focus on current account deficits that are *both* large and persistent. We define a deficit as persistent when it lasts for at least 10 years and as large when the average deficit is greater than 4, 6, 8 or 10% of GDP. Considering these different thresholds is important for establishing that patterns are robust. To ensure that our sample does not include episodes with large current account swings, we only classify a deficit as persistent when it is larger than the threshold listed above and there are no years with current account deficits smaller than 50% of that threshold. Because it is possible for overlapping periods to satisfy our definitions, and since the presence of overlapping episodes would complicate analysis, we build a data set of non-overlapping episodes by selecting, among possible candidates, the episode with the largest average current account deficit.

Using this approach, we identify 90 4% episodes, 56 6% episodes, 39 8% episodes, and 25 10% episodes.[6] The resulting list is in Table 8 in the "Appendix".

Following Eichengreen and Panizza (2016), we build our control group using all non-overlapping 10-year periods between 1970 and 2013 (1970–1979; 1980–1989; 1990–1999; 2000–2010) that (i) do not overlap with one of the deficit episodes and (ii) do not overlap with any other period for which the 10-year average of the

[6] Table 8 in the "Appendix" provides the full list.

current account deficit exceeds the threshold. The sum of episodes and control-group cases gives the total number of usable observations for each threshold. When we use the 4% threshold, for example, we have 250 observations (90 episodes and 160 control-group periods), whereas when we use the 10% threshold we have 317 observations (25 episodes and 292 control-group periods).

4% episodes are not uncommon: 36% of our observations are so classified (Table 2). Sub-Saharan Africa and Emerging Europe have the greatest prevalence of such episodes, but we also find a substantial number of them in other developing regions and in advanced economies. By comparison, the share of 4% episodes is very high (73%) in low income countries (most low income countries in the sample being in Sub-Saharan Africa).

Using the 6% threshold, 20% of observations qualify. We still find that a large number of episodes (more than a third) are in Sub-Saharan Africa and Emerging Europe. In other developing regions, in contrast, the share of episodes is often less than 15%, and in the advanced economies it is just 10%. In low income countries the share of 6% episodes is close to 50%.

With an 8% threshold, 13% of observations qualify as episodes, with a relatively large number of large, persistent deficit episodes in Sub-Saharan Africa, Emerging Europe, and low income countries (about 30% of observations) and a moderate number of episodes in Latin America and the Caribbean (10% of observations). There are very few episodes in Asia, Middle East and North Africa and the advanced economies (the share of episodes ranges between 2 and 6%, and the number of episodes is never greater than three).

In the case of the 10% threshold, large and persistent current account deficits are predictably rare. There are only 25 such episodes (8% of observations in our sample). These 10% episodes are concentrated in Sub-Saharan Africa and Emerging Europe. There are no 10% episodes in Asia and in the advanced economies, just two in the Middle East and North Africa, and just four in in Latin America and the Caribbean (one in Central America and three in the Caribbean).

Are large and persistent deficits more likely in countries that receive large official flows, defined as situations in which more than 30% of the current account deficit is financed with official flows?[7] Some 56% of periods characterized by large official flows overlap with 4% episodes. Focusing on 6% episodes, we find a 28% overlap with periods characterized by large official flows, and for 8 and 10% episodes the overlaps with large official flows periods are 16 and 11%, respectively.

A problem with scaling official flows by the current account is that we may have large ratios not because official inflows are large but because the deficit (the denominator) is small. We therefore also look at cases where net official inflows are greater than 30% of the thresholds used to build the episodes.[8] When scaling official flows by GDP, we find a 71% overlap between large official flows periods and 4%

[7] We use total net official flows and divide them by the current account balance. We set this variable equal to zero for country-years with negative official flows or a current account surplus.

[8] These values are 1.2% of GDP when we look at 4% current account deficits, 1.6% of GDP for 6% current account deficits, 2.4% of GDP for 8% current account deficits, and 3% of GDP for 10% current account deficits.

Table 2 Episodes and control periods

	4% CA Deficit				6% CA Deficit			
	Episodes	Control	% Episodes	Total	Episodes	Control	% Episodes	Total
ALL countries	90	160	36%	250	56	222	20%	278
SSA	31	22	58%	53	23	37	38%	60
Asia	10	23	30%	33	4	30	12%	34
MNA	6	16	27%	22	4	27	13%	31
LAC	17	38	31%	55	9	53	15%	62
EME	12	6	67%	18	9	12	43%	21
AE	14	55	20%	69	7	63	10%	70
LIC	22	8	73%	30	16	18	46%	34
Large off. flows to CA	36	28	56%	64	20	52	28%	72
Large off. flows to GDP	49	20	71%	69	30	28	52%	58
	8% CA Deficit				10% CA Deficit			
	Episodes	Control	% Episodes	Total	Episodes	Control	% Episodes	Total
ALL countries	39	265	13%	304	25	292	8%	317
SSA	19	48	28%	67	15	62	19%	77
Asia	1	37	2%	38	0	37	0%	37
MNA	2	31	6%	33	2	32	6%	34
LAC	7	62	10%	69	4	67	6%	71
EME	7	16	30%	23	4	19	17%	23
AE	3	71	4%	74	0	75	0%	75
LIC	11	27	29%	38	8	36	19%	44
Large off. flows to CA	14	72	16%	86	10	84	11%	94
Large off. flows to GDP	17	28	31%	55	11	35	24%	35

episodes; the overlaps are 52% for 6% episodes and 31 and 24 for 8 and 10% episodes, respectively.

3 Correlates

As a first step in examining the correlates, Table 3 focuses on 4% episodes. Persistent deficits in excess of 4–5% enter the danger zone distinguished by the IMF in its research and policy analysis (see e.g. Ghosh and Ramakrishnan 2017 and the citations in our introduction), making this threshold a logical cut-off. We flag results that are different for the other thresholds in the text below.[9]

[9] Table O1 in the online appendix considers 6, 8 and 10% episodes.

Table 3 The correlates of large and persistent current account deficits 4% definition

	All countries			Developing countries		
	Episode	Control	Diff	Episode	Control	Diff
Exports to GDP	34.93	36.50	− 1.58	34.03	34.17	− 0.14
Imports to GDP	47.39	35.70	11.69***	47.93	34.46	13.47***
Share of machinery imports	22.9	27.1	− 4.2***	22.1	27.4	− 5.3***
Imports of machinery to GDP	10.4	9.9	0.5	10.2	9.2	1.0
Net FDI inflows to GDP	4.25	2.48	1.77***	4.39	2.25	2.14***
Net portfolio investment to GDP	0.40	− 0.42	0.81***	0.20	− 0.13	0.32
Net foreign assets to GDP	− 68.77	− 10.10	− 58.67***	− 72.04	− 17.61	− 54.43***
Real GDP growth	5.44	4.98	0.46	5.55	5.35	0.10
Saving rate	14.38	23.72	− 9.33***	13.93	23.67	− 9.74***
Investment rate	23.74	22.36	1.38*	23.37	22.41	0.97
GDP per capita	11,619	19,369	− 7750***	7215	9382	− 2167
Terms of trade	− 0.09	− 0.03	− 0.05	− 0.10	− 0.04	− 0.05
Return differential	0.37	− 1.17	1.54***	0.38	− 1.37	1.75***
Net official flows to CA				34.4	19.5	0.00
Net official flows to GDP				2.7	0.6	2.1***
External debt to GDP				74.22	44.80	29.42***
Short term debt to Ext Debt				13.69	14.04	− 0.35
Concessional debt to Ext Debt				91.55	85.16	6.39**

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

We start by considering the effects of exports and imports, which generally dominate the current account. We do not find a statistically significant difference in export-to-GDP ratios between our episodes and control group. In contrast, episodes have import-to-GDP ratios 12 percentage points higher than the control group (the difference reaches 21 percentage points for 8% episodes). This is unsurprising: finance for the current account deficit allows countries to import more. Still, that the difference in imports relative to GDP is very large is striking and noteworthy.

De Long and Summers (1991) found that investment in equipment is a key driver of economic growth. We therefore check whether countries with large and persistent deficits use foreign savings to finance the imports of machinery and equipment. To the contrary, large and persistent current account deficits are actually associated with *lower* imports of machinery relative to GDP. The difference between episodes and control-group cases is 4 percentage points (7 percentage points for 10% episodes) and statistically significant at the 1% confidence level. The higher import ratios of countries that rely on foreign savings are fully offset by the lower share of imports of machinery. It follows that imports of machinery (as a share of GDP) are essentially identical in treatment and control-group cases. Further results below cast doubt on whether foreign finance has sustained faster rates of economic growth. The

failure of countries to use that foreign finance to boost imports of equipment and machinery may be part of the explanation.[10]

Countries running current account deficits should be accumulating foreign liabilities, and deficit episodes are in fact associated with lower net foreign assets. Net foreign assets can take a variety of forms, however, some of which do not vary between the treatment and control groups. For example, there is no difference in international reserves, on average, between treatment and control-group cases, the same applies to the level of the real exchange rate and capital account openness (results available upon request).

There is also no statistically significant correlation between the likelihood of observing an episode on the one hand and the terms of trade, and GDP growth on the other. However, the averages in Table 3 mask more complicated dynamic behavior of these variables, as we show below.

Deficit episodes are most prevalent in poor countries. GDP per capita is $7000 lower in the treatment group than the control group (the difference is $9000 for 10% episodes). In the subsample of developing countries the difference is, predictably, smaller and not statistically significant.[11]

Investment rates are 1.4 percentage points higher in countries experiencing deficit episodes.[12] At the same time, savings rates are 9 percentage points lower. This suggests that, on average, countries running large and persistent current account deficits have investment rates somewhat higher than the control group, but that their investment rates would have been much lower had they had not been able to tap foreign savings. Put another way, our large-and-persistent-deficit episodes reflect low savings rates more than high investment rates.

We also compute the difference between net investment income recorded in the balance of payments and the notional income a country would obtain if it received (or paid) 5% interest on its net foreign assets (the return assumed by Hausmann and Sturzenegger 2007).[13] The likelihood of observing an episode is positively correlated with this return differential.

Are these results dominated by official flows? As a first indicator of official flows, we use the share of the current account balance financed by net official inflows. We divide the net official inflows by the current account deficit and set this indicator to zero for countries with a current account surplus and countries with net official

[10] In contrast, large and persistent current account deficits are associated with above-average FDI inflows. While portfolio inflows are also higher than in than control group cases, the difference is not large, and it is never statistically significant for developing countries. Whether large current account deficits financed mainly by FDI "turn out better"—whether or not followed by equally sharp changes in GDP growth—is a separate question, to which we turn in Sects. 4 and 5 below.

[11] This is in line with the results of Table 2 showing that episodes are more frequent in developing countries.

[12] It goes up to 3 percentage points in the 8% episodes, though the difference is not always statistically significant.

[13] While there is much analysis of why some countries earn excess returns on their net foreign assets and whether these returns are sustainable (see inter alia Gourinchas and Rey 2007; Curcuru et al. 2007; Hausmann and Sturzenegger 2007; Eichengreen 2004), we simply note that countries may be able to run larger current account deficits when the return on their gross foreign assets is higher than that on their gross foreign liabilities.

outflows. In most cases, episodes are characterized by a larger share of official finance, but the difference is not statistically significant. As mentioned above, this may reflect fact that small current account deficits lead to high ratios even in the presence of limited official flows (because the current account deficit is the denominator). When we instead scale total net official flows (either positive or negative) by GDP, official flows are significantly larger during episodes, confirming the importance of official finance.

Unsurprisingly, large and persistent current accounts deficit are associated with large debt stocks. The difference ranges from 30 to 47% of GDP and is statistically significant at conventional confidence levels. However, there is no difference in the shares of short- and long-term debt between treatment and control-group cases, although deficit episodes are characterized by larger shares of public and publicly-guaranteed external debt. This is another nail in the coffin of the Lawson-Robichek doctrine that countries can sustain large current account deficits so long as they are associated with private sector borrowing.

Finally, episodes are associated with a larger share of concessional debt, consistent with the high number of episodes in low-income countries.

3.1 Soft landing or sudden stop?

We now examine the behavior of a set of macroeconomic variables over the course of the deficit episode itself.

In Fig. 1 the episode is the shaded area; we also report data 1 year before the beginning of the episode and 1 year following it. The solid line is the average during the episode (with 95% confidence intervals) and the horizontal dashed line is the overall average for episodes and tranquil periods alike.

The top left figure of each panel plots the current account. In the presence of well-functioning capital markets, countries that use foreign savings to build up their capital stocks and use their newly accumulated capital and become richer should see their current account deficits to narrow gradually. This does not seem to be the case in practice. Evidently, episodes do not end because countries are growing up and out of their deficits, but rather because they abruptly lose access to credit.

The conclusion that deficit episodes end when countries lose access to market-based finance is also supported by the fact that investment, which during the episode is often significantly above average, collapses subsequently. In all episodes we also observe a sudden drop in imports. The real effective exchange rate appreciates sharply during the first 7–8 years of current account deficit episodes, and there is some reversion towards the end. These are classic signs of a sudden stop in capital flows.[14]

To learn more about financing mechanisms, we use balance of payment accounts to decompose the net capital inflows associated with large and persistent deficit episodes. We divide net inflows into capital account balance; net errors and

[14] There are instead no clear patterns for GDP growth. The real exchange rate tends to depreciate at the end of the episode but the effect is not statistically significant.

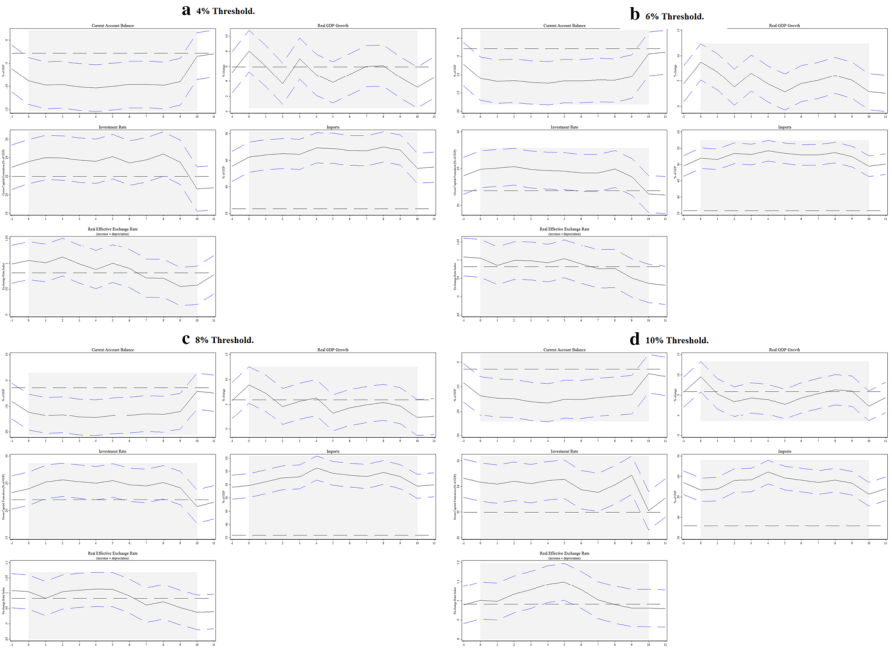

Fig. 1 Evolution of main economic variables during episodes. The solid line plots the average value during episodes with 95% confidence intervals. The horizontal line is the overall average in tranquil and episode periods

omissions and the four main categories of the financial account balance.[15] We track the composition of net inflows starting 5 years before the onset of the episode and going all the way to 15 years after the inset of the episode.

Comparing the current account deficit (the solid line in Fig. 2) with its financial components (the colored bars in Fig. 2), we find that the two main sources of financing are "net direct investment" and "net other investment." Net direct investment is more stable and remains positive after the episode ends while "net other investment" dries up (and turns into a net outflow).

The figure also shows that international reserves increase during the first 7 years of episodes (i.e., there are negative changes in reserves-to-GDP ratio). In the boom years, evidently, capital inflows are larger than the current account deficit and that the authorities are doing at least something to limit overheating. Reserves start falling, however, towards the end of the episode. This is consistent with the idea that the central bank is trying to offset the impact of the decline in private capital inflows.

We also study the coincidence with various crisis indicators. The first one is the Catão and Milesi-Ferretti's (2014) "external crisis" measure. This variable takes a

[15] Balance of payments accounting distinguishes three main sources of external financing: (i) capital transfers (for example, grants and debt forgiveness by creditors) which are recorded in the *capital account* of the balance of payment; (ii) liabilities creating capital inflows (direct investment, portfolio investment, other investment, and changes in reserve assets) which are recorded in the *financial account* of the balance of payments; and (iii) net errors and omissions which is a residual category to insure that the balance of payments sums to zero.

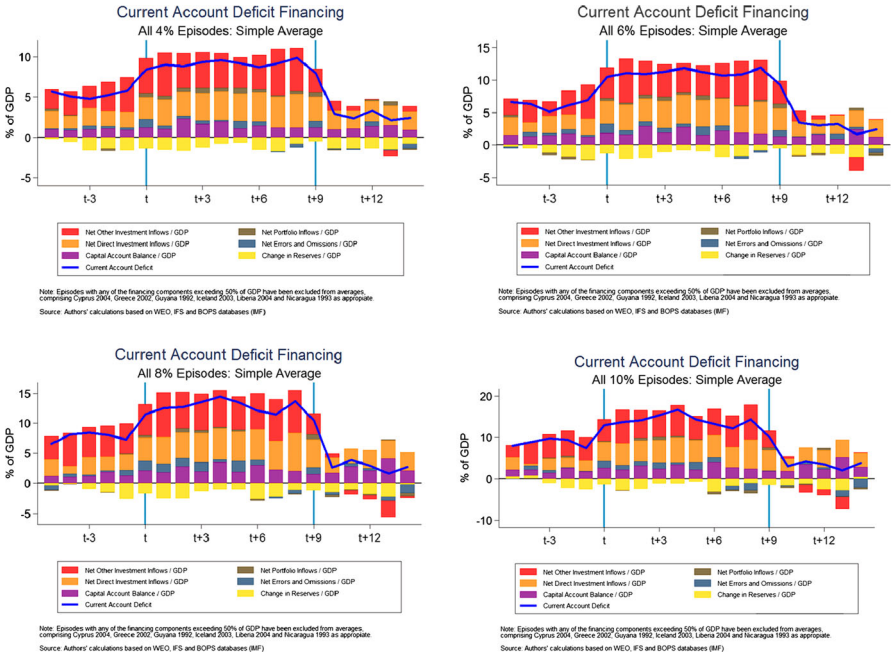

Fig. 2 The financing of large and persistent current account deficits

value of one in the presence of debt defaults, rescheduling events, and events that require IMF support bigger than twice the respective country's IMF quota. It is available for 89 countries in our sample with annual frequency over the period 1970–2011. The second indicator variable, which takes a value of one in the presence of a systemic banking crisis, is from Laeven and Valencia (2012) and covers all countries in our sample over the period 1970–2011. Finally, we measure crises with data on sudden stops in net capital flows from Cavallo et al. (2015). A sudden stop is a large (i.e., 2 standard deviations) and abrupt contraction in the net capital flows recorded in the financial account of the balance of payments. These data are available for 105 countries in our sample with annual frequency over the period 1980–2014.

Table 4 shows that the unconditional probability of observing an external crisis in an advanced economy ranges between 1 and 2%, while the probability conditional on observing a large and persistent current account deficit rises as high as 14% in the 5 years following an 8% episode. That this conditional probability is only 14% reminds us that current account deficits are not a very reliable leading indicator of external crises in advanced economies, where crises can also result from inter alia the elasticity and malfunctioning of highly liquid domestic financial markets (as argued and documented by Jordà et al. 2011; Taylor 2013).

This conclusion does not carry over to developing countries, however. Whereas the unconditional probability of an external crisis there is 22%, the conditional probability can be as high as 53%. That large and persistent current account deficits culminate in debt defaults, reschedulings and resort to IMF assistance more frequently in developing than advanced economies is no surprise. But this is an

Table 4 Episodes and financial crises

	Advanced economies			Developing countries		
	Years	Years	Unconditional	Years	Years	Unconditional
Crisis/years	6–10	11–15	Probability	6–10	11–15	Probability
4% episodes						
External	3%	3%	2%	26%	32%	21%
Systemic Banking	26%	24%	15%	8%	8%	8%
Sudden Stop	8%	28%	14%	6%	8%	4%
6% episodes						
External	6%	4%	1%	32%	45%	22%
Systemic Banking	30%	17%	11%	10%	12%	8%
Sudden Stop	3%	17%	13%	8%	7%	4%
8% episodes						
External	13%	14%	1%	30%	53%	22%
Systemic Banking	40%	29%	10%	10%	9%	8%
Sudden Stop	10%	50%	13%	7%	9%	4%
10% episodes						
External	NA	NA	NA	39%	42%	22%
Systemic Banking	NA	NA	NA	13%	7%	9%
Sudden Stop	NA	NA	NA	3%	0%	4%

important reminder for those tempted to generalize, erroneously, from the absence of this association in high-income countries to the experience and prospects of their lower-income brethren.

The results for systematic banking crises and sudden stops are again different. For systemic banking crises, the unconditional probability in advanced economies is between 10 and 15%, but the conditional probability can be as high as 40%. In this case the difference between unconditional and conditional probability of observing a banking crisis is instead smaller in developing countries. The unconditional probability of observing a sudden stop in an advanced economy is approximately 13%, but the conditional probability can be as high as 50%. In the case of developing countries the unconditional probability is 4% and the conditional probability ranges between 6 and 9%. Evidently, advanced countries are not immune from the negative consequences of large and persistent current account deficits, but when these occur they manifest themselves in sudden stops and systemic banking problems rather than in debt default and restructuring, which are relatively more prevalent in the developing world.

3.2 Regression analysis

We now estimate probit models where the units of observation are based on the 10-year periods described above and the dependent variable takes a value of one during episodes and zero otherwise. Without an instrumental variables strategy we cannot make strong claims of causality. The statistical analysis of this section just allows us to describe the

conditional correlation between current account episodes and a large set of variables (in an effort to do more we use identification by heteroskedasticity below).

We start by regressing the dependent variable on a set of regional dummies. Consistent with Table 2, we find that 4, 6 and 8% episodes are more likely in Sub-Saharan Africa and Emerging Europe, while there is no statistically significant difference for advanced economies (the excluded category), Asia, Middle East and North Africa, and Latin America and Caribbean (columns 1, 3, and 5 of Table 5, the Table reports marginal effects).[16]

Table 3 showed that deficit episodes are more likely in poorer economies, and the list of episodes in Table 8 suggests that episodes are more likely in small economies. We therefore augment the model with country size (measured by the log of total GDP) and the level of economic development (measured by the log of GDP per capita). Country size is always negatively and significantly correlated with the likelihood of an episode (evidently, large countries find it more difficult to finance large, persistent deficits). The coefficient on income per capita is sometimes negative (4 and 6% episodes), sometimes positive (8 and 10% episodes) and rarely significant at conventional confidence levels. Controlling for GDP and GDP per capita reverses the coefficients of most of the regional dummies; the exception is Emerging Europe, which remains positive but is no longer statistically significant. Conditional on country size and income per capita, we are now *less* likely to observe 4 and 8% episodes in developing regions.

Next we drop the regional dummies and augment the model with measures of capital account openness, the savings rate and terms of trade. We focus on 4% episodes and run regressions for the full sample (Table 6, columns 1 and 3) and the subsample of developing countries (columns 2 and 4).[17] Our results for total GDP and GDP per capita are robust to controlling for these variables. Capital account openness is positively correlated with the likelihood of observing an episode but only in the sample that includes advanced economies.

Recall that terms of trade were not statistically significant in the univariate correlations of Table 3. The multivariate results are more intuitive insofar as theory and logic suggest that countries wish to borrow abroad in bad times. What is surprising here is that in at least some cases they can borrow abroad in face of adverse shocks for periods as long as 10 years. Finally, our previous result that the likelihood of observing an episode is negatively correlated with domestic savings is robust to controlling for the variables in Table 6.

We can augment the model with FDI, portfolio inflows, and official inflows (all in net terms and scaled by GDP) and corroborate the finding of the univariate analysis that FDI and official inflows are positively associated with large and persistent current account deficits (columns 3 and 4). Consistent with the textbook distinction between portfolio flows on the one hand and FDI and official flows on the other (Frankel and Rose 1996; Carlson and Hernandez 2002), countries that rely on portfolio inflows are less likely to experience a large and persistent current account deficit, presumably because portfolio flows are more prone to interruption.

[16] The results of columns 7 and 8 and difficult to interpret because, when we consider 10% episodes, the dependent variable becomes collinear with the advanced economies and Asian dummies.

[17] Tables O2 and O3 in the online appendix report results for 6, 8, and 10% episodes.

Table 5 Regional distribution of episodes controlling for GDP and GDP per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(GDP)		− 0.137***		− 0.093***		− 0.049***		− 0.001**
		(0.025)		(0.015)		(0.011)		(0.0005)
Ln(GDPPC)		− 0.070*		− 0.021		0.001		0.0003
		(0.037)		(0.022)		(0.012)		(0.0003)
SSA	0.398***	− 0.334***	0.315***	− 0.168***	0.288***	− 0.0470	0.895***	0.736***
	(0.087)	(0.090)	(0.092)	(0.053)	(0.092)	(0.039)	(0.038)	(0.115)
ASIA	0.121	− 0.300***	0.026	− 0.158***	− 0.030	− 0.078***		
	(0.112)	(0.079)	(0.098)	(0.035)	(0.069)	(0.024)		
MNA	0.086	− 0.240***	0.042	− 0.133***	0.036	− 0.051**	0.924***	0.906***
	(0.130)	(0.085)	(0.103)	(0.036)	(0.089)	(0.024)	(0.022)	(0.087)
LAC	0.127	− 0.342***	0.063	− 0.179***	0.075	− 0.064**	0.795***	0.702***
	(0.096)	(0.074)	(0.083)	(0.044)	(0.074)	(0.032)	(0.079)	(0.125)
EME	0.467***	0.041	0.383***	0.008	0.352**	0.094	0.984***	0.990***
	(0.105)	(0.153)	(0.131)	(0.093)	(0.138)	(0.096)	(0.014)	(0.005)
Observations	250	247	278	275	304	299	280	274
Pseudo R2	0.09	0.25	0.10	0.27	0.08	0.31	0.15	0.39
Sample	All	All	All	All	All	All	All	All
Threshold	4%	4%	6%	6%	8%	8%	10%	10%

This table reports the results of a set of probit regressions where the dependent variable takes a value 1 during episodes and 0 in control periods. The control variables are dummy variables for Sub-Saharan Africa (SSA), Asia (ASIA), Middle East and North Africa (MNA), Latin America and the Caribbean (LAC), and emerging Europe (EME). The excluded group is advanced economies. The remaining controls are the log of GDP and log of GDP per capita (both measured in constant dollars). The table reports marginal effects

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 6 Correlates of current account episodes

	(1)	(2)	(3)	(4)
Ln(GDP)	− 0.097***	− 0.121***	− 0.064***	− 0.056
	(0.024)	(0.031)	(0.024)	(0.035)
Ln(GDPPC)	0.009	− 0.011	0.038	0.0437
	(0.033)	(0.049)	(0.038)	(0.060)
CA open	0.211*	0.217	0.254**	0.361**
	(0.115)	(0.149)	(0.120)	(0.157)
Saving rate	− 0.026***	− 0.023***	− 0.022***	− 0.021***
	(0.005)	(0.006)	(0.006)	(0.007)
Ter. of tr.	− 0.287**	− 0.328**	− 0.402**	− 0.500***
	(0.131)	(0.145)	(0.157)	(0.192)
Official			0.100**	0.129***
			(0.039)	(0.048)
FDI			0.003***	0.005***
			(0.0009)	(0.001)
Portfolio			− 0.003**	− 0.007***
			(0.001)	(0.002)
No. obs	205	139	196	132
	0.30	0.29	0.37	0.40
Sample	All	Dev	All	Dev
Threshold	4%	4%	4%	4%

This table reports the results of a set of probit regressions where the dependent variable takes a value 1 during episodes and 0 in control periods. The control variables are the log of GDP and log of GDP per capita (both measured in constant dollars), the Chinn and Ito index of capital account openness, national savings over GDP, terms of trade, official flows over GDP, FDI flows over GDP and portfolio flows over GDP. The table reports marginal effects

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

4 Growth and volatility

Figure 1 showed that there was no clear link between large sustained current account deficits and growth. In this section we analyze these dynamics in more detail.

4.1 Growth during and after episodes

To explore what happens to growth during and after large deficit episodes, we build impulse response functions using a methodology similar to Jordà's (2005) local projections method. Specifically, we estimate:

$$G_{i,t,t+h} = \alpha + \beta^h EPI_{i,t} + X_{i,t}\Gamma^h + \varepsilon_{i,t+h} \quad (1)$$

Here t is the first year of either an episode or a control period, $G_{i,t,t+h}$ is average growth between period t and period $t + h$ (with $h = \{1, 2, \ldots, 20\}$), EPI_t is a

dummy variable that takes a value of 1 if t is the first year of an episode and zero if t is the first year of a control period, and X_t is a set of controls.

In Eq. (1), β^h is the impulse response h periods after the start of an episode. Since $G_{t,t+h}$ is average growth between t and $t+h$, β^h should not be interpreted as the effect of the episode in year $t+h$ (that interpretation would be valid had the dependent variable instead been $G_{t+h-1,t+h}$). Instead, β^h summarizes the average effect of the episode over the period starting at t and ending at $t+h$. This is the equivalent of an accumulated impulse response function with the traditional VAR methodology.

We estimate four models. The first model does not include controls (we set $X_t = 0$). In the second model we include the log of initial GDP per capita (to control for convergence), average years of education of the adult population (to control for human capital), and the saving rate (since we found that large and persistent episodes are more likely in countries with low saving rates).[18] In the third model we add a dummy variable (OFF) that takes a value of one for periods characterized by high levels of official financial flows (where net official financial flows scaled by GDP are above the sample median), and the interaction between this dummy and the episode dummy. Thus we estimate:

$$G_{i,t,t+h} = \alpha + \beta^h\left(EPI_{i,t} \times \left(1 - OFF_{i,t}\right)\right) + OFF_{i,t}\left(\delta^h EPI_{i,t} + \theta^h\right) + X_{i,t}\Gamma^h + \varepsilon_{i,t+h} \quad (2)$$

In this set-up, β^h measures growth after episodes that took place in periods characterized by low official inflows, while δ^h measures growth after episodes that took place in periods characterized by high official inflows. We estimate Eq. (2) controlling for initial income and human capital.

In the fourth model we explore the role of FDI inflows and check whether episodes characterized by high FDI inflows are different from episodes characterized by low FDI inflows. In practice, we estimate Eq. (2) by replacing the OFF dummy with a dummy that takes a value of one in periods characterized by high FDI inflows.[19]

While the impulse responses obtained from Eqs. (1) and (2) cannot be interpreted as the causal effect of an episode on growth, they allow us to track what happens to growth over the course of an episode compared to tranquil periods. (We return to this issue of causality later in this section.)

Building these impulse-response functions requires estimating 20 regressions for each equation, since $h = 20$.[20] In Figs. 3, 4, 5 and 6, the solid line is the point estimate while the dashed lines indicate 95% confidence intervals.[21]

[18] Results are essentially identical if we estimate this model without controlling for the saving rate.

[19] We define as high FDI inflows periods where FDI inflows relative to GDP are above the sample median.

[20] Since we have four models and four thresholds, we estimate a total of 320 regressions. Full regression results are in Tables O7–O22 in the online Appendix.

[21] For instance, the top left panel of Fig. 3 plots the coefficients of the regressions reported in Table O7: when $h = 1$, EPI has a positive and statistically significant coefficient (the point estimate is 0.0205), the

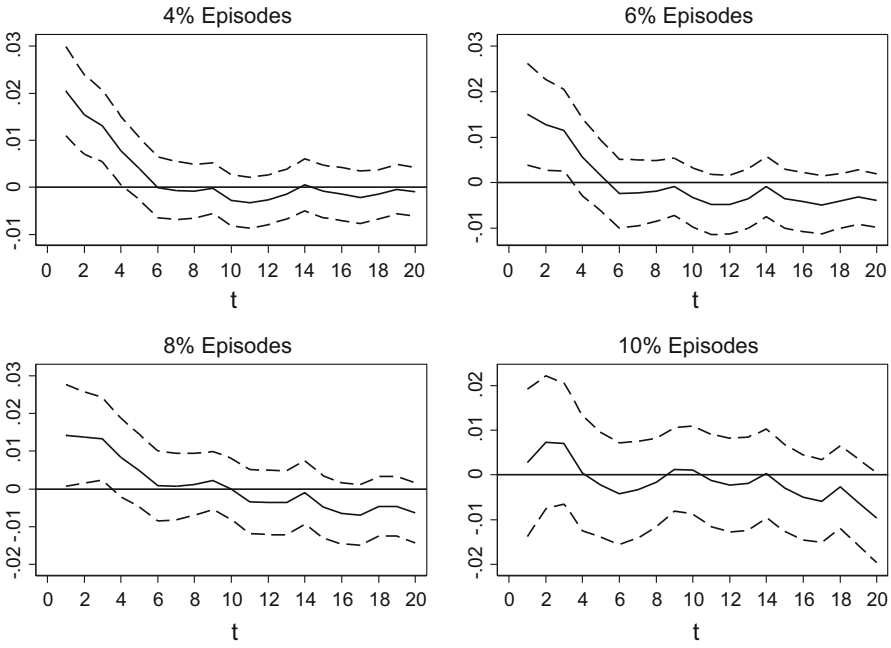

Fig. 3 GDP growth after the onset of the episode, no control

In the model with no controls (Fig. 3), 4 and 6% episodes are associated with above-average growth in the first 3–4 years, but after the fifth year there is no statistically significant difference between episodes and other periods. In both cases, the point estimates become negative (suggesting that episodes lead to lower growth in the long run), but the difference is never statistically significant. We find that 8% episodes are similar, although the results are somewhat weaker (we find small positive and marginally significant growth in the first 3 years and then a declining and statistically insignificant effect with negative point estimates 10 years after the start of the episode). In the case of 10% episodes, growth during the episode itself is never significantly different from that in the control group, although we find that 20-year growth is negative and statistically significant at the 10% confidence level (see Table O10 of the online appendix).

In regressions controlling for convergence, human capital, and the saving rate we again find that current account episodes do not have any positive effect on long run growth (the top left panel plots of Fig. 4 plots the result for 4% episodes, Figure O1 in the online appendix compares 4% episodes with 6, 8, and 10% episodes). If anything, 10% episodes are followed by lower growth at long horizons (the

Footnote 21 continued
coefficient remains positive and statistically significant until $h = 4$, at $h = 5$ is positive but not significant, and at $h = 6$ it becomes negative but still insignificant. For $h > 6$, the coefficient remains negative but it is never statistically significant. The top-left panel of Fig. 7, instead, plots the coefficient reported in Table A12. In this case, the coefficient is always positive but not statistically significant when $h > 6$.

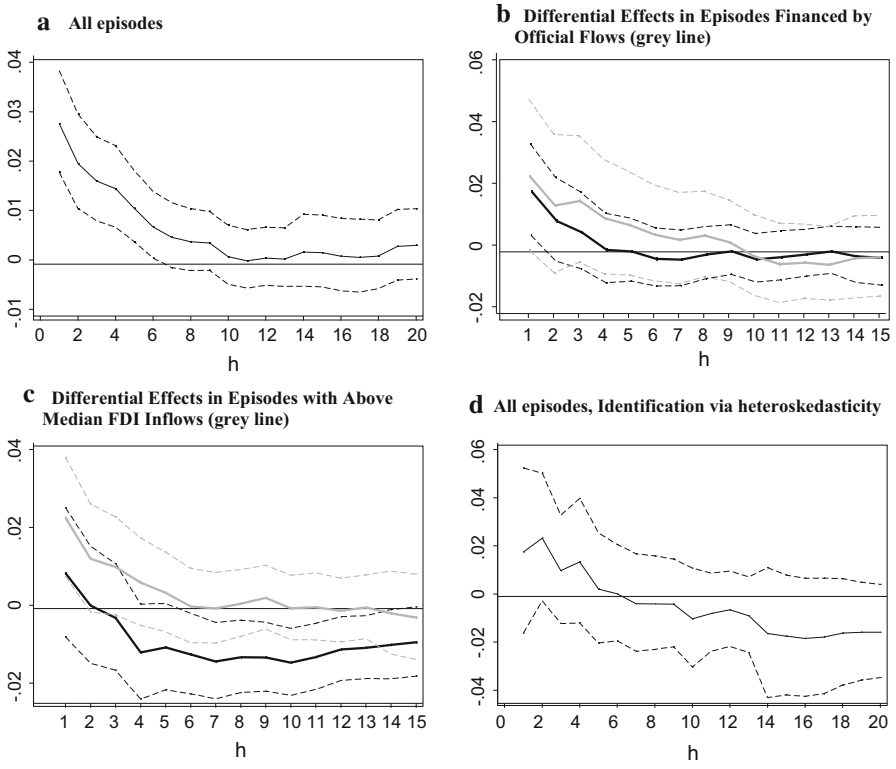

Fig. 4 GDP growth after the onset of 4% episode, controlling for convergence, human capital, and saving rate

difference from the control group is again significant at the 10% confidence level for 20-year horizons, Table O14 in the online appendix).

One important caveat is that the control variables that we include in the regression may themselves have been influenced by capital inflows and hence controlling for these factors dampens the growth effect of inflows.[22] This is why we show that our results are robust to not controlling for these factors.

When we compare growth after episodes financed with official inflows (the gray lines in the top right panel of Fig. 4) with growth after episodes financed by other means (the black lines in the graph), we find no difference for 4% episodes but we find slightly higher growth for 6 and 8% episodes not financed with official flows (Figure O2 in the online appendix). Thus, it is difficult to draw strong conclusions about differences in the growth effects of large deficits financed by official versus other types of flows.

Next, we consider FDI financing: the gray lines in bottom left panel of Fig. 4 (and in Figure O3 of the online appendix) plot post-episode growth in episodes where FDI inflows were above the sample median. For 4 (and 6) percent episodes,

[22] A possible solution to this problem would be estimating a full-fledged simultaneous equation model, but the estimation of such a model is well beyond the objective of this paper.

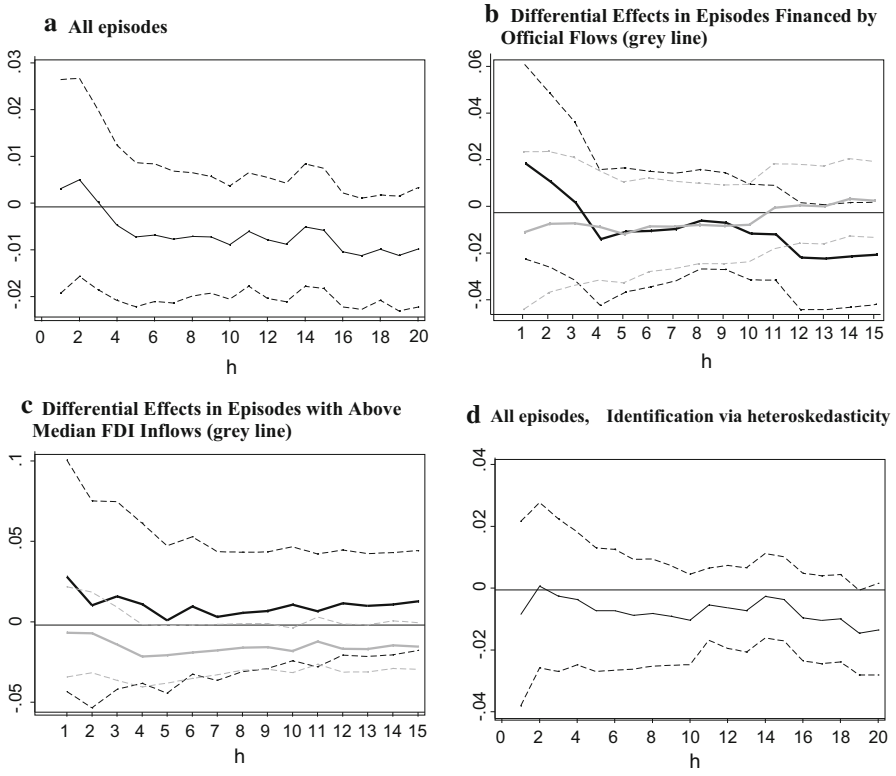

Fig. 5 GDP growth after the onset of 4% episode, controlling for convergence, human capital, and saving rate dropping low income countries

FDI flows seem to deliver higher post-episode growth. But, as before, the difference between the two paths is not statistically significant.[23]

We also estimate Eqs. 1 and 2 by dropping low income countries. The results (reported in Fig. 5) show that if we drop these countries, 4% episodes do not boost growth even in the short run. We also experiment by estimating the model for 4% episodes but dropping from the control group all countries that had persistent deficit that ranged between 1 and 4%. The results (reported in Fig. 6) are essentially identical to the baseline results of Fig. 3.[24]

In the top left panel of Fig. 7 we use the model that controls for convergence, human capital and the saving rate to compare the evolution of log GDP per capita in a control-group country (the solid line) with a treatment-group country with the same initial conditions. For 4% episodes (Figure O4 in the online appendix compares 4% episodes with 6, 8, and 10% episodes). In most cases, there is no

[23] For 8 and 10% episodes, there seem to be no difference between episodes with large and small FDI flows.

[24] We would like to thank an anonymous referee for suggesting to drop low income countries and intermediate cases.

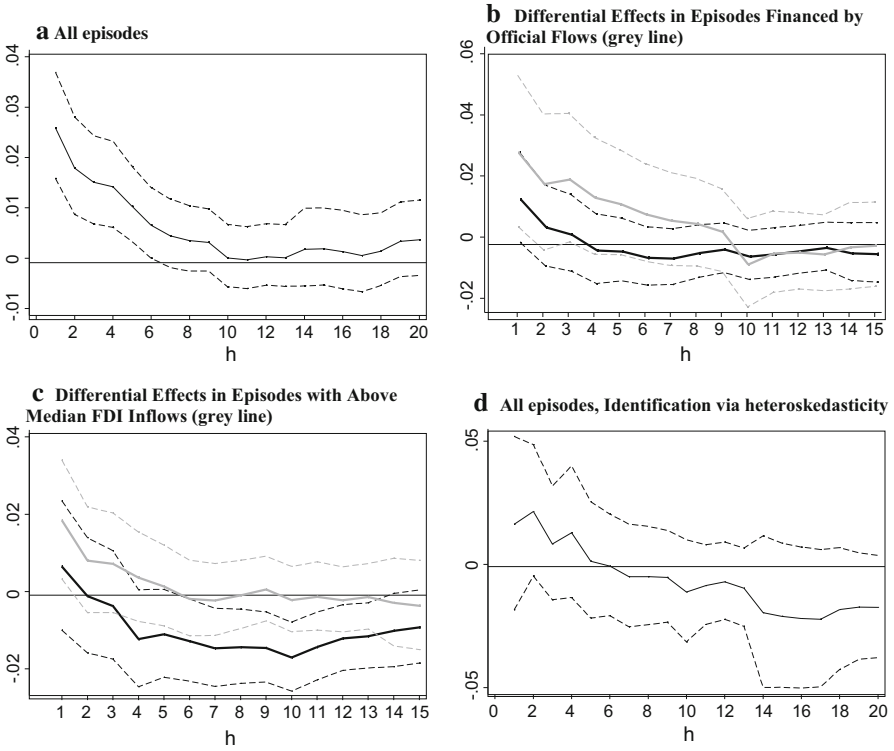

Fig. 6 GDP growth after the onset of 4% episode, controlling for convergence, human capital, and saving rate dropping 1–3.99% episodes

difference between episodes and control-group cases, but for 10% episodes, we find that after 20 years the level of GDP is 17% lower in deficit countries than in control-group cases. When we drop low income countries from the sample (bottom left panel of Fig. 7) we find that that 4% episodes have a negative effect on the level of income at a 20-year horizon.

Recall that 10% episodes are concentrated in countries receiving official finance (mostly in Sub-Saharan Africa). Insofar as official finance is provided in response to country problems, lower growth at long horizons may reflect those problems (selectivity) and not the effects of extended periods of foreign finance per se. Given this, we attempt to identify how large and persistent current account deficits affect subsequent growth by using heteroskedasticity in the regression residuals to identify causal relationships, following Hogan and Rigobón (2003) and Lewbel (2012).

Assume that we are interested in estimating Eq. (1), that the episode dummy is endogenous, and that $\boldsymbol{X}$ is a matrix of exogenous variables. If to the standard OLS assumptions, we add an heteroskedasticity assumption (i.e., we assume that $E(Xu^2) \neq 0$, where u is the error term in the equation in which the episode depends on growth), then we can use Xu^2 as an instrument for *EPI*.

The resulting impulse responses functions, in the bottom right panels of Figs. 4, 5 and 6, again paint a largely negative picture of the growth effects of large and

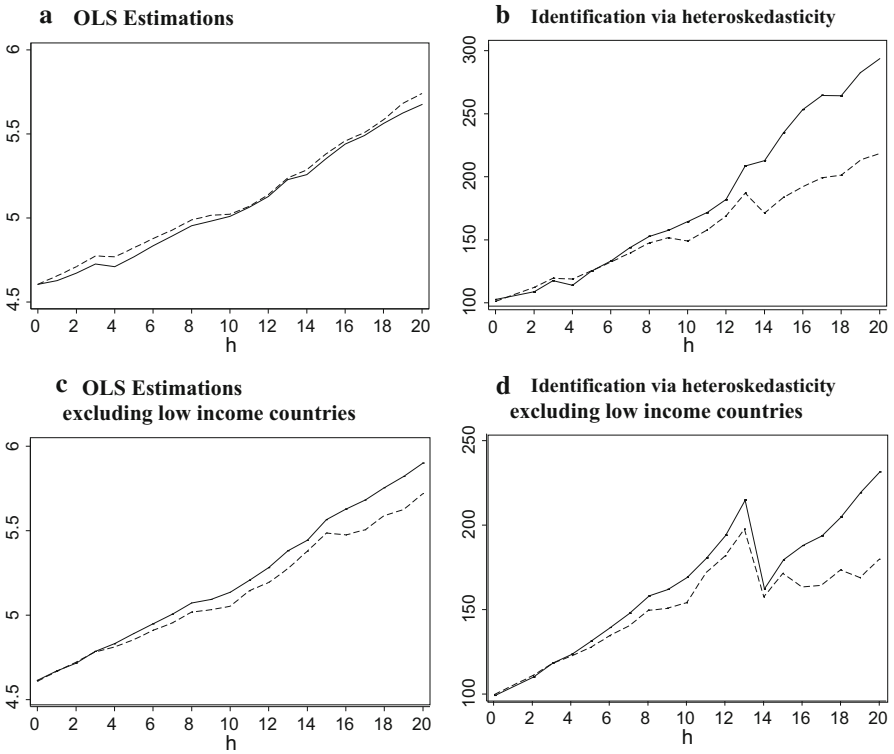

Fig. 7 Counterfactual analysis: the level of income with and without episodes (controlling for convergence, human capital, and saving rate)

persistent current account deficits.[25] We find no significant positive effect, not even in the short run, but large negative effects in the long run that are sometimes statistically significant at the 5% confidence level (for 6 and 10% episodes, see Figure XO5 in the online appendix). The level of income is lower, not higher, after 20 years (compare the actual and counterfactual paths in Fig. 7 above).

In sum, we do not find that large and persistent current account deficits are associated with higher long-term growth. If anything the opposite is true. These conclusions contrast with those of Ranciere et al. (2006), who similarly consider both the positive impact on growth of access to external finance but also the negative impact of the heightened crisis risk associated with external financial dependence, and conclude that the former outweighs the latter. However, they consider a much smaller sample of emerging and developing countries, but also and more importantly limit their focus to five-year periods, where we similarly show that the net impact is positive in the first five years but turns negative thereafter.

[25] The first stages of the IH regressions pass the standard weak instrument and specification tests. The Cragg Donald Wald F test is 14.87 for the regressions that focus on 4% episodes, 19.69 for 6% episodes, 20.39 for 8% episodes, and 13.95 for 10% episodes. The p value of the Sargan tests are 0.36, 0.71, 0.74, and 0.92, respectively.

4.2 Volatility

So far we have shown that large and persistent current account deficits do not pay dividends in terms of long-run growth. We now check if there are costs in terms of output volatility by estimating the following GARCH model:

$$G_{i,t+h} = \alpha + \delta R_i + \varepsilon_{i,t+h} \tag{3}$$

$$\sigma_{i,t+h} = \phi + \psi EPI_{i,t} + \vartheta \sigma_{i,t+h-1} + \rho u^2_{i,t+h-1} + u_{i,t+h} \tag{4}$$

In Eq. (3) we regress annual growth h years after the episode on a set of regional dummies. In Eq. (4) the variance of annual growth is a function of being within 20 years of the beginning of an episode (EPI), a GARCH (1) component and an ARCH (1) component. The GARCH and ARCH parameters ϑ and ρ capture the persistence in output volatility, while ψ captures differences in the annual volatility of GDP growth between years that follow episodes and control periods.

We estimate Eqs. (3) and (4) by setting $h = \{1, 2, \ldots, 20\}$ (average volatility during the full twenty years following the beginning of the episode or the beginning of the control period), $h = \{1, 2, \ldots, 10\}$ (average volatility during the episode compared with average volatility in the first ten years of the control period), and $h = \{11, 12, \ldots, 20\}$ (average volatility in the ten years following the end of the episode compared with volatility in the 10 years that follow the end of the control period).

Examining 4% episodes (Table 7, column 1) reveals no difference in output volatility over the full 20 year period (top panel of Table 7). However, the treatment group is less volatile during the episode itself (middle panel of Table 7) and more volatile afterwards (bottom panel of Table 7). Together with the results of the previous section, this suggests that relatively small (4%) deficits deliver both higher growth and less volatility in the short run at the price of more volatility after the episode and no difference in long-run growth or the level of output. When we consider 6, 8 and 10% episodes (Table 7 columns 2–4), current account deficits are associated with higher output volatility both during and after the episodes.

Table 7 Growth volatility

	(1) 4% episodes	(2) 6% episodes	(3) 8% episodes	(4) 10% episodes
	$h = \{1, 2, \ldots, 20\}$			
ψ	− 0.09	0.81***	0.30	0.55**
	(0.11)	(0.14)	(0.27)	(0.27)
	$h = \{1, 2, \ldots, 10\}$			
ψ	− 0.22*	0.27*	0.44**	0.59***
	(0.13)	(0.15)	(0.18)	(0.20)
	$h = \{11, 12, \ldots, 20\}$			
ψ	0.21*	1.44***	1.18***	0.46
	(0.14)	(0.30)	(0.38)	(0.79)

This table reports the results of the GARCH estimates of the model described in Eq. (4)

Overall, it would appear that large and persistent current account deficits deliver little if any gain in terms of growth and some pain in terms of additional volatility.

5 Investment

Our analysis has focused on the impact on economic growth of large and persistent current account deficits, rather than the channels linking the two variables. Recall how in motivating our analysis we invoked the accounting identity that the current account is equal to the difference between national savings and investment and the implication that, in the presence of low domestic savings, investment needs to be financed with "foreign savings", implying a current account deficit. In this section we therefore look directly at the operation of this mechanism.

The simple correlation of Table 3 showed that current account deficits are not associated with higher imports of machinery. At the same time, Fig. 1 shows that investment rates tend to be higher during the first 7–8 years of current account deficit episodes but then collapse toward the end of the episode. Panel a of Fig. 8 confirms that investment rates are higher in the first 3 years of 4% episodes. After 4 years,

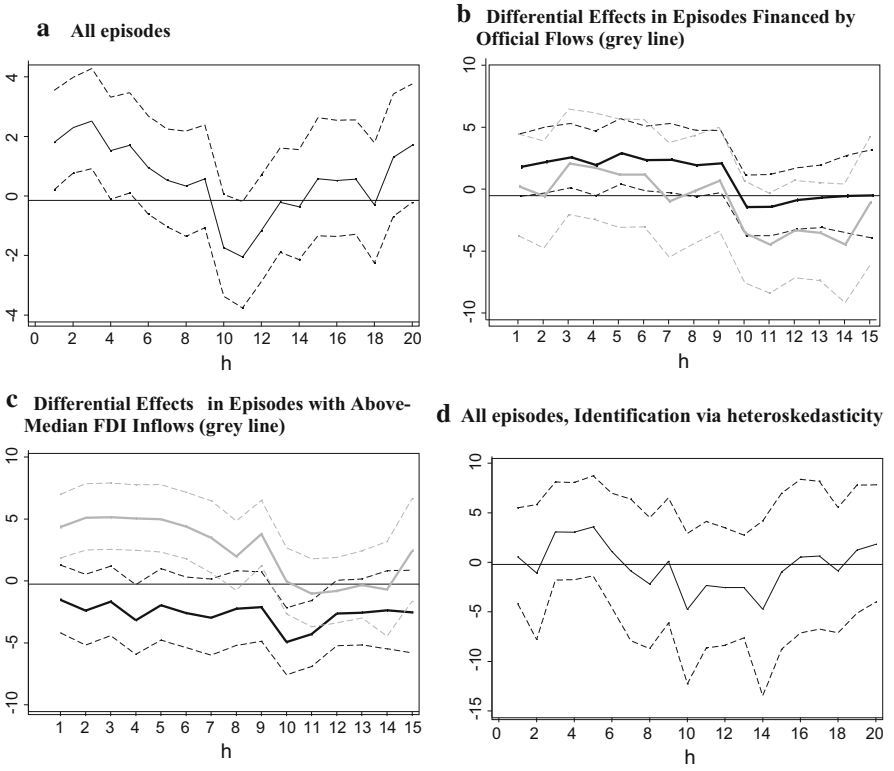

Fig. 8 Investment rate after the onset of 4% episode, controlling for convergence, human capital, and saving rate

however, the difference between episodes and the control-group cases is no longer statistically significant. Around year 9 of the episode the difference becomes negative (i.e., investment is lower in the treatment group than in the control group).[26]

Panel b of Fig. 8 shows that there are no differences between episodes financed with official flows and episodes financed with private funds. However, there is a substantial difference between episodes financed with FDI flows and episodes financed with other types of funds (Panel c of Fig. 8). Whereas investment ratios are significantly higher in episodes financed with FDI flows, they are lower than in the control group for other types of funding (although the difference is not statistically significant). Identification via heteroscedasticity suggests no difference in investment ratios between treatment- and control-group cases (panel d of Fig. 8).

6 Conclusion

Foreign funding offers attractive opportunities for financing domestic investment but comes with risks. To analyze the tradeoffs, we examined episodes characterized by large and sustained current account deficits, of which there turn out to be a surprising number. Since 1970 a substantial number of countries have been able to finance significant portions of their domestic investment out of foreign saving. While a non-negligible fraction of these episodes are in low-income countries where official finance is more important than private finance, we have also identified episodes financed with private capital inflows, in sharp contrast to received wisdom.

But our analysis also suggests that foreign funding is not a good substitute for domestic savings in the sense that episodes characterized by current account deficits that are both large and persistent do not end well. They often end with sharp compression of the current account, a drop in investment, and a fall in economic growth, where the deterioration in growth performance in the medium and long term dominates any short-term boost to growth in the short run.

Thus whatever its short-term benefits, reliance on foreign savings delivers higher volatility together with sub-par long-run growth performance. We conclude that financing growth and investment out of foreign savings, while not impossible, is risky and is best pursued cautiously if at all.

Acknowledgements We would like to thank Luis Servén, and two anonymous referees for very useful comments and Kailin Chen, Matías Marzani and Juan Espinosa for research assistance. The opinions expressed are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.

Appendix

See Tables 8 and 9.

[26] That difference is statistically significant at year 11.

Table 8 Full list of episodes at various current account deficit thresholds

4%					6%					8%		10%	
AUS1981	AE	ALB2004	EME	BEN1979	SSA	CYP1976	AE	COG1987	SSA	GRC2002	AE	LBN2002	MNA
AUS2003	AE	ARM1994	EME	BEN1997	SSA	ESP2001	AE	CPV2003	SSA	PRT2000	AE	ARM1994	EME
CYP1976	AE	BGR2000	EME	CAF1983	SSA	GRC2002	AE	GHA2004	SSA	SGP1973	AE	BIH1999	EME
CYP2004	AE	BIH1999	EME	CMR1978	SSA	IRL1977	AE	GNB1987	SSA	MDV2003	Asia	EST1999	EME
ESP2001	AE	CZE1995	EME	COG1987	SSA	NZL1979	AE	LBR2004	SSA	LBN2002	MNA	GEO2003	EME
GRC1977	AE	EST1999	EME	CPV2003	SSA	PRT2000	AE	LSO1995	SSA	ALB2004	EME	BHS2004	LAC
GRC2002	AE	GEO2003	EME	GHA1992	SSA	SGP1974	AE	MDG1979	SSA	ARM1994	EME	BRB1970	LAC
IRL1977	AE	HRV1997	EME	GHA2004	SSA	MDV2003	Asia	MDG1990	SSA	BIH1999	EME	JAM2002	LAC
ISL2003	AE	HUN1998	EME	GNB1987	SSA	NPL1988	Asia	MLI1981	SSA	EST1999	EME	NIC1993	LAC
NZL1979	AE	LTU1999	EME	KEN1990	SSA	PNG1980	Asia	MOZ2004	SSA	GEO2003	EME	COG1990	SSA
NZL1999	AE	LVA1999	EME	LBR2004	SSA	VUT1987	Asia	MRT1979	SSA	LTU1999	EME	CPV1995	SSA
PRT2000	AE	ROU2003	EME	LSO1995	SSA	LBN2002	MNA	MWI1979	SSA	LVA1999	EME	GNB1987	SSA
SGP1975	AE	BHS2004	LAC	MDG1979	SSA	SAU1983	MNA	NER1986	SSA	BHS2004	LAC	LBR2004	SSA
USA1999	AE	BLZ1999	LAC	MDG1990	SSA	TUN1977	MNA	SDN2000	SSA	BRB1970	LAC	LSO1995	SSA
KHM2004	Asia	BOL1984	LAC	MLI1981	SSA	ALB2004	EME	SEN1979	SSA	GUY1992	LAC	MLI1981	SSA
LAO1988	Asia	BRB1970	LAC	MOZ2004	SSA	ARM1994	EME	SEN2002	SSA	HND1976	LAC	MOZ2004	SSA
LKA1985	Asia	CHL1978	LAC	MRT1979	SSA	BIH1999	EME	SLE2003	SSA	JAM2002	LAC	MRT1979	SSA
MDV2003	Asia	CRI1999	LAC	MWI1979	SSA	EST1999	EME	SYC1980	SSA	NIC1993	LAC	SEN1979	SSA
NPL1988	Asia	DOM1974	LAC	NER1986	SSA	GEO2003	EME	SYC2004	SSA	COG1990	SSA	SLE2003	SSA
PAK1988	Asia	GTM1998	LAC	RWA1980	SSA	HUN1998	EME	TGO1997	SSA	CPV2003	SSA	SYC1980	SSA
PNG1980	Asia	GUY1992	LAC	SDN2000	SSA	LTU1999	EME	TZA1990	SSA	GHA2004	SSA	SYC2004	SSA
THA1976	Asia	GUY2004	LAC	SEN1979	SSA	LVA1999	EME	TZA2004	SSA	GNB1987	SSA	TGO1997	SSA
THA1988	Asia	HND1979	LAC	SEN2002	SSA	ROU2003	EME	ZMB1981	SSA	LBR2004	SSA	TZA1990	SSA
VUT1987	Asia	HND2003	LAC	SLE2003	SSA	BHS2004	LAC			LSO1995	SSA	ZMB1981	SSA
ISR1975	MNA	HTI1977	LAC	SYC1980	SSA	BRB1970	LAC			MDG1979	SSA		

Table 8 continued

4%				6%				8%	10%
LBN2002	MNA	JAM2002	LAC	SYC2004	SSA	CHL1978	LAC	MLI1981	SSA
SAU1983	MNA	NIC1993	LAC	TGO1997	SSA	GUY1992	LAC	MOZ2004	SSA
TUN1977	MNA	PER1986	LAC	TZA1990	SSA	HND1978	LAC	MRT1979	SSA
TUN1992	MNA	PRY1979	LAC	TZA2004	SSA	HND2003	LAC	NER1986	SSA
				UGA1994	SSA	JAM2002	LAC	SEN1979	SSA
				ZMB1981	SSA	NIC1993	LAC	SEN2002	SSA
						PRY1979	LAC	SLE2003	SSA
								SYC1980	SSA
								SYC2004	SSA
								TGO1997	SSA
								TZA1990	SSA
								ZMB1981	SSA

Table 9 Description of the variables and data sources

Variable	Description and source
Current account to GDP	Current account balance divided by GDP in %. Source: World Bank, World Development Indicator (WDI). When WDI data are missing we use data from the IMF balance of payment statistics
Exports to GDP	Total exports divided by GDP in %. Source: World Bank, World Development Indicator (WDI). When WDI data are missing we use data from the IMF balance of payment statistics
Imports to GDP	Total exports divided by GDP in %. Source: World Bank, World Development Indicator (WDI). When WDI data are missing we use data from the IMF balance of payment statistics
Share of machinery imports	Machinery imports over total imports in %. Source: World Bank, World Development Indicator (WDI)
Imports of machinery to GDP	Machinery imports over total GDP in %. Source: World Bank, World Development Indicator (WDI)
Capital account to GDP	Capital account balance divided by GDP in %. Source: IMF balance of payment statistics
Net FDI inflows to GDP	Net Foreign Direct Investment inflows divided by GDP in %. Source: IMF balance of payment statistics
Net portfolio investment to GDP	Net Foreign Direct Investment inflows divided by GDP in %. Source: IMF balance of payment statistics
Net foreign assets to GDP	Net Foreign Direct Investment inflows divided by GDP in %. Source: IMF balance of payment statistics
Real GDP growth	Growth of GDP per capita (%) in constant PPP US$. Source: World Bank, World Development Indicator (WDI)
Saving rate	National savings divided by GDP in %. Source: World Bank, World Development Indicator (WDI)
Investment rate	National investment divided by GDP in %. Source: World Bank, World Development Indicator (WDI)
GDP per capita	GDP per capita in constant PPP US$. Source: World Bank, World Development Indicator (WDI)
Terms of trade	Terms of trade index. Source: World Bank, World Development Indicator (WDI)
Return differential	Difference between net investment income recorded in the balance of payments and the notional income that a country would obtain if it received (or paid) 5% interest on its net foreign assets. Source: Own calculations based on IMF balance of payment statistics and External Wealth of Nations data
Net official flows to CA	Net Foreign Direct Investment inflows divided by current account balance in %. Source: IMF balance of payment statistics
Net official flows to GDP	Net Foreign Direct Investment inflows divided by GDP in %. Source: IMF balance of payment statistics
Real exchange Rate	Real exchange rate. Source: World Bank, World Development Indicator (WDI) and Bank for International Settlements real exchange rate data
Human capital	Percentage of Secondary Schooling Attained in Population. Source: Barro and Lee
External crisis	Dummy variable that takes a value 1 of there is an external debt crisis. Source: Catão and Milesi-Ferretti (2014)
Systemic banking crisis	Dummy variable that takes a value 1 of there is a systemic bank crisis. Source: Laeven and Valencia (2012)

Table 9 continued

Variable	Description and source
Sudden stop	Dummy variable that takes a value 1 of there is a sudden stop. Source: Cavallo et al. (2015)

References

Adalet, M., & Eichengreen, B. (2007). Current account reversals: always a problem? In *G7 current account imbalances: Sustainability and adjustment, Clarida*. 2007.

Apergis, N., & Tsouimas, C. (2009). A survey of the Feldstein-Horioka puzzle: What has been done and where we stand. *Research in Economics, 63,* 64–76.

Bayoumi, T. (1990). Savings-investment correlations: Immobile capital, government policy or endogenous behavior? *IMF Staff Papers, 37,* 360–387.

Benigno, G., & Fornaro, L. (2014). The financial resource curse. *Scandinavian Journal of Ecnoomics, 116,* 58–86.

Blanchard, O. (2007). Adjustment within the Euro: The difficult case of Portugal. *Portuguese Economic Journal, 6,* 1–21.

Bussière, M., & Fratzscher, M. (2008). Financial openness and growth: Short-run gain, long-run pain? *Review of International Economics, 16*(1), 69–95.

Calvo, G., Izquierdo, A., & Mejía, L.-F. (2004). *On the empirics of sudden stops: The relevance of balance-sheet effects*. Paper presented at the conference "Emerging Markets and Macroeconomic Volatility: Lessons from a Decade of Financial Debacles," San Francisco, United States, Federal Reserve Bank of San Francisco, June 4–5.

Carlson, M., & Hernandez, L. (2002). *Determinants and repercussions of the composition of capital inflows* (International Finance Discussion Paper 717). Washington, DC, United States: United States Federal Reserve System.

Catão, L. A., & Milesi-Ferretti, G. M. (2014). External Liabilities and Crises. *Journal of International Economics, 94,* 18–32.

Cavallo, E., & Frankel, J. (2008). Does openness to trade make countries more vulnerable to external crises, or less? Using gravity to establish causality. *Journal of International Money and Finance, 27,* 1430–1452.

Cavallo, E., Powell, A., Pedemonte, M., & Tavella, P. (2015). A new taxonomy of sudden stops: Which sudden stops should countries be most concerned about? *Journal of International Money and Finance, 51,* 47–70.

Curcuru, S., Dvorak, T., & Warnock, F. (2007). *The stability of large external imbalances: The role of returns differentials* (NBER Working Paper 13074). Cambridge, United States: National Bureau of Economic Research.

De Long, J. B., & Summers, L. H. (1991). Equipment investment and economic growth. *Quarterly Journal of Economics, 106*(2), 445–502.

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

Eichengreen, B. (1985). The Gold Standard since Alec Ford. In B. Eichengreen & M. Flandreau (Eds.), *The Gold standard in theory and history* (pp. 187–206). London: Routledge.

Eichengreen, B. (2004). *Global imbalances and the lessons of Bretton Woods* (NBER Working Paper 10497). Cambridge, United States: National Bureau of Economic Research.

Eichengreen, B., & Panizza, U. (2016). A surplus of ambition: Can Europe rely on large primary surpluses to solve its debt problem? *Economic Policy, 31*(85), 5–49.

Feldstein, M., & Horioka, C. (1980). Domestic saving and international capital flows. *Economic Journal, 90*(358), 314–329.

Fischer, Stanley. (1988). Real balances, the exchange rate, and indexation: Real variables in disinflation. *Quarterly Journal of Economics, 103*(1), 27–49.

Fischer, S. (1994). Comments on Dornbusch and Werner. Brookings Papers on Economic Activity, No. 1, pp. 304–309.

Fischer, Stanley. (2003). Financial crises and reform of the international financial system. *Review of World Economics/Weltwirtschaftliches Archiv, 139*(1), 1–37.
Fishlow, A. (1985). Lessons from the past: Capital markets during the 19th century and the interwar period. *International Organization, 39,* 383–439.
Frankel, J. A., & Rose, A. K. (1996). Currency crashes in emerging markets: An empirical treatment. *Journal of International Economics, 41,* 351–366.
Freund, C., & Warnock, F. (2007). Current account deficits in industrial countries: The bigger they are, the harder they fall? In *G7 current account imbalances: Sustainability and adjustment*, Clarida, 2007.
Ghosh, A., & Ramakrishnan, U. (2017). Current account deficits? Is there a Problem? *Finance and Development*. http://www.imf.org/external/pubs/ft/fandd/basics/current.htm.
Gopinath, G., Kalemli-Ozcan, S., Karabarbounis, L., & Villegas-Sanchez, C. (2016). Capital allocation and productivity in South Europe. *Quarterly Journal of Economics* (forthcoming).
Gourinchas, P-O., & Rey, H. (2007). From world banker to world venture capitalist: U.S. external adjustment and the exorbitant privilege. In R. Clarida (Ed.), *G7 current account imbalances: Sustainability and adjustment*, Chicago, United States.
Gourinchas, P.-O., Valdes, R., & Landerretche, O. (2001, January). Lending Booms: Latin America and the World. *Economic Journal of the Latin American and Caribbean Economic Association*.
Hausmann, R., & Sturzenegger, F. (2007). The missing dark matter in the wealth of nations and its implications for global imbalances. *Economic Policy, 22,* 469–518.
Hogan, V. P., & Rigobón, R. (2003). *Using heteroscedasticity to estimate the returns to education* (Working Papers 200301). Dublin, Ireland: University College Dublin, School of Economics.
Jordà, Ò. (2005). Estimation and inference of impulse responses by local projections. *American Economic Review, 95,* 161–182.
Jordà, Ò., Schularick, M., & Taylor, A. (2011). Financial crises, credit booms and external imbalances: 140 Years of lessons. *IMF Economic Review, 59,* 340–378.
Laeven, L., & Valencia, F. (2012). *Systemic banking crises database: An update* (IMF Working Paper 12/163). Washington, DC, United States: International Monetary Fund.
Lewbel, A. (2012). Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models. *Journal of Business & Economic Statistics, 30*(1), 67–80.
Milesi Ferretti, G. M., & Razin, A. (2000). Current account reversals and currency crises: Empirical regularities. In *Currency Crises*, Krugman, 2000.
Prasad, E., Rajan, R., & Subramanian, A. (2007). Foreign capital and economic growth. Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution, vol. 38(2007-1), pp. 153–230.
Ranciere, R., Tornell, A., & Westermann, F. (2006). Decomposing the effects of financial liberalization: Crises vs. growth. *Journal of Banking & Finance, 30,* 3331–3348.
Reinhart, C., & Trebesch, C. (2015). The pitfalls of external dependence: Greece, 1829–2015. *Brookings Papers on Economic Activity* (Fall), 307–328.
Reisen, H. (1997). The limits of foreign savings. In R. Hausmann & H. Reisen (Eds.), *Promoting savings in Latin America* (pp. 233–264). Washington/Paris: IDB/OECD.
Schularick, M., & Steger, T. (2010). Financial integration, investment and economic growth: Evidence from two eras of financial globalization. *Review of Economics and Statistics, 92,* 756–758.
Taylor, A. (1994). *Domestic saving and international capital flows reconsidered* (NBER Working Paper 4892). Cambridge, United States: National Bureau of Economic Research.
Taylor, A. (2013). *External imbalances and financial crises* (IMF Working Paper no. WP/13/260).
Tornell, A., & Westermann, F. (2002). Boom-bust cycles in middle income countries: Facts and explanation. IMF Staff Papers, Palgrave Macmillan, vol. 49(Special i), pp. 111–155.