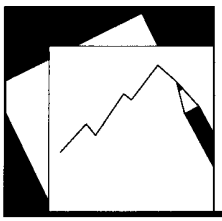

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Rapid Current Account Adjustments: Are Microstates Different?

Patrick Imam

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African Department

Rapid Current Account Adjustments: Are Microstates Different?

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Abstract

We describe unique aspects of microstates—they are less diversified, suffer from lumpiness of investment, they are geographically at the periphery and prone to natural disasters, and have less access to capital markets—that may make the current account more vulnerable, penalizing exports and making imports dearer. After reviewing the "old" and "new" view on current account deficits, we attempt to identify policies to help reduce the current account. Probit regressions suggest that microstates are more likely to have large current account adjustments if (i) they are already running large current account deficits; (ii) they run budget surpluses; (iii) the terms of trade improve; (iv) they are less open; and (v) GDP growth declines. Monetary policy, financial development, per capita GDP, and the de jure exchange rate classification matter less. However, changes in the real effective exchange rate do not help drive reductions in the current account deficit in microstates. We explore reasons for this and provide policy implications.

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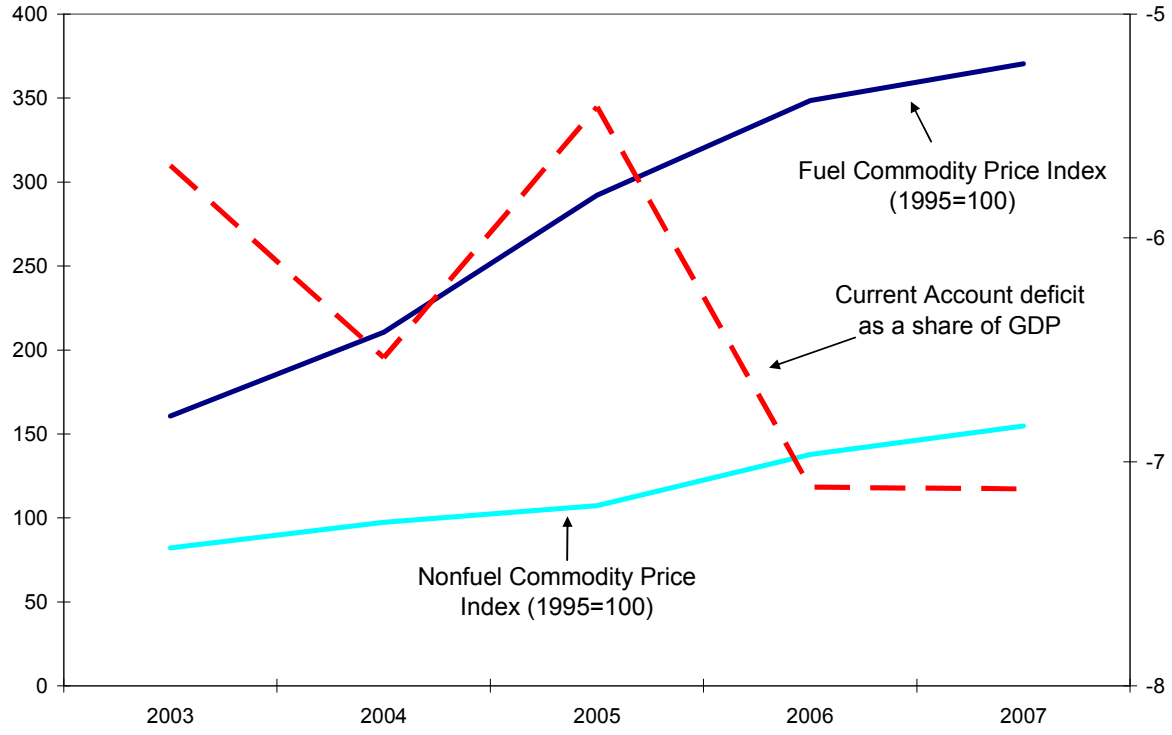
I. Introduction

Economists have long recognized that microstates—defined as countries with an average population of less than 2 million between 1970 and 2005—face distinctive challenges in their economic development. For example, a small population implies that domestic demand is insufficient to reach the minimum scale necessary for efficient output of most goods. Moreover, a small domestic market creates natural monopolies for many production goods, thereby raising domestic input costs. Smallness also implies that outputs and exports are not diversified, making the country more vulnerable and raising the cost of access to capital markets (see Armstrong and Read, 2002). These characteristics make microstates vulnerable to shocks, especially terms of trade shocks.

As commodity prices have risen, microstates have been hit hard. Petroleum prices have quadrupled since 1999, and food prices have increased by more than 50 percentage points since 2000. At the same time, the dismantling of preferential trade agreements, such as the Multi-Fiber Agreement (MFA), and lower guaranteed export prices from the European Union, such as for sugar, have reduced export earnings for many microstates. These multiple shocks have lead to a substantial deterioration in the terms of trade for microstates, which are typically net importers of commodities and which have long benefited from trade preferences for their exports. This had recently led to a widening current account (CA) deficit that is not expected to reverse soon (Figure 1).

Figure 1: Current Account Deficit of Microstates and Fuel and Nonfuel Commodity Price Index, 2003–2007



Source: IMF, World Economic Outlook.

CA deficits develop for a number of reasons. They can reflect a worsening of the terms of trade; if so, there will be different implications than a deficit that reflects a surge in consumption produced by government deficits. Therefore, while large CA deficits do not necessarily lead to a crisis, when they are caused by terms of trade shocks they are often an omen of a looming crisis. Advising governments on how to reduce the CA is therefore a precautionary tool to avoid a potential crisis. With this in mind, we will analyze how countries subject to large persistent and negative terms of trade shocks adjust their CA, with the goal of drawing policy lessons for microstates.

The paper makes two main contributions to the policy debate on CA adjustments:

1. It differentiates between microstates and other states, making it possible to draw conclusions specific to smaller economies.
2. It looks at sustained reduction of the CA deficit rather than just abrupt and short-lived fluctuations.

The remainder of the paper is structured as follows: After describing the evolution of CAs in microstates (Section II), we analyze their unique characteristics (Section III). After reviewing the "old" and "new" view of current account deficits (Section IV), we evaluate econometrically determinants of rapid CA improvements as they apply to microstates (Section V), draw conclusions, and discuss policy implications (Section VI).

II. Evolution of the Current Account of Microstates, 1980–2005

For our purposes we define as microstates those countries with an average population of less than 2 million inhabitants between 1970 and 2005.[2] Our sample covers 40 states, of which two-thirds are islands, ranging from St. Kitts and Nevis (population: 42,000), to countries like Mauritius (population: 1.3 million). Similarly, income ranges from very poor states, like Guinea-Bissau, to very wealthy ones, like Qatar and Bermuda. Geographically, micro-states are mainly found in the Caribbean, around the African Coast line and in the Pacific Ocean.

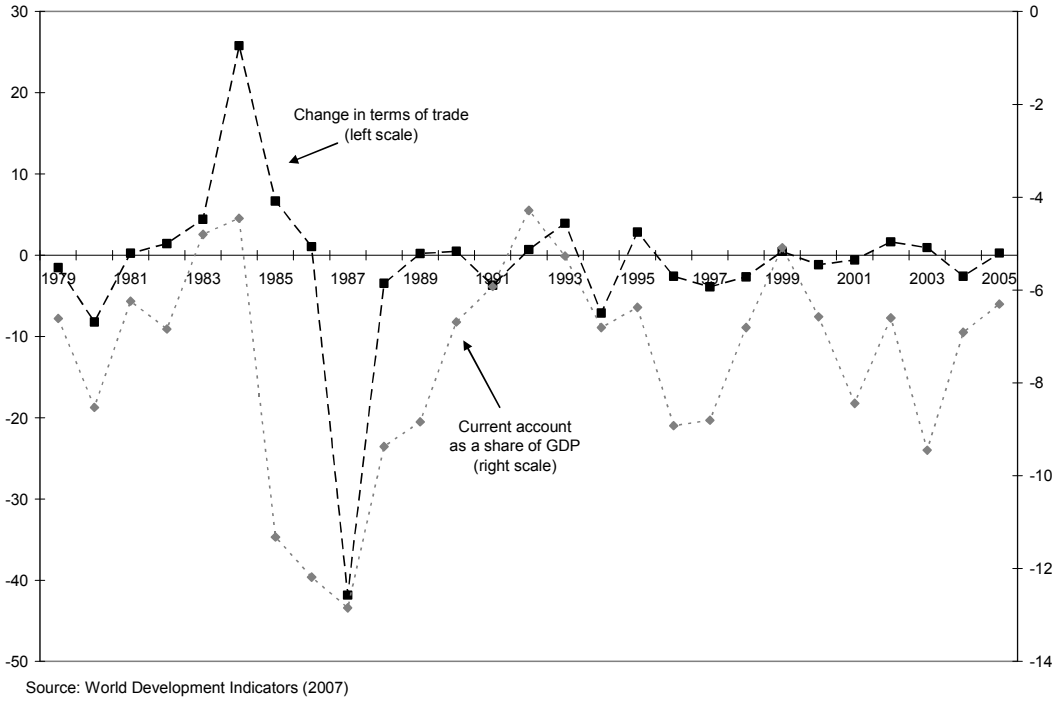
A brief look suggests that the variation of the CA in microstates can be explained in large part by terms of trade movements,[3] which have a large lagged effect on the CA and tend to co-move with it (Figure 2). Volatility in the CA of microstates is thus highly correlated with changes in

[2] While the 2 million benchmark was chosen arbitrarily, we believe that it is a good demarcation point. We tested for the 1 million and 3 million thresholds, but results did not change significantly. In alphabetic order, the microstates in the study are Antigua and Barbuda, Bahrain, the Bahamas, Belize, Bermuda, Barbados, Bhutan, Botswana, Comoros, Cape Verde, Cyprus, Dominica, Djibouti, Equatorial Guinea, Fiji, Gabon, The Gambia, Guinea-Bissau, Grenada, Guyana, Iceland, Kuwait, Lesotho, Luxembourg, Maldives, Malta, Mauritius, Namibia, Netherlands Antilles, Oman, Qatar, São Tomé & Príncipe, Seychelles, Solomon Islands, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Swaziland, Trinidad and Tobago, Vanuatu, and Samoa. For lack of historical data, we do not include the newest microstates, such as Timor-Leste or Palau.

[3] Kuwait is excluded from that graph, to account for the 1990/91 Gulf War.

the terms of trade. Developments in the CA of micro-states are heavily influenced by outside shocks, as opposed to simply domestic factors. This is to be expected: microstates are very open and have less diversified economies, which means that price changes of exports and imports have a large impact (see also Section III).

Figure 2: Current Account Balance and Lagged Terms of Trade Changes, 1980–2005
(Percent of GDP)



Source: World Development Indicators (2007)

That CA changes are affected by terms of trade movements was established by Harberger (1950) and Laursen and Metzler (1950). Both studies illustrate how a negative terms of trade shock leads to deterioration in the CA because a country's real income decreases. Both use a Keynesian framework that assumes a marginal propensity to consume that is less than unity, and both find that a negative terms of trade shock induces a decrease in savings and net exports because a fall in purchasing power (from exports) reduces real income. In their model (henceforth HLM), investment is assumed to remain unchanged, so the CA worsens.

Extending this model to view the CA as an outcome of maximizing intertemporal utility, Obstfeld (1983) and Svensson and Razin (1983) showed that with perfect capital mobility, price flexibility, and efficient capital markets, the relationship between terms of trade shocks and the CA depends on the persistence of the shocks: they found that the HLM effect occurs only if the shock is transitory. During temporary negative shocks, economic agents borrow from abroad to smooth consumption, which has the effect of worsening the CA. When the terms of trade shocks are permanent, the CA changes little, because rational agents adjust their behaviors, by revising their expected current and future income downward and reducing consumption without changing their savings.

Few studies have tested for these effects. A notable exception, Mendoza (1995), using a sample of 30 developed and developing countries for 1960–90, finds that the CA and terms of trade are positively correlated, which is consistent with the HLM effect. However, the fact that the positive correlations are seen to be independent of the persistence of terms of trade shocks challenges the validity of the model. Therefore, given the limited sample size and time period, we cannot draw solid conclusions from Mendoza's paper about how terms of trade shocks affect the CA. More generally, it is likely that CAs in micro-states are affected by more than simply terms of trade shocks, and this will be analyzed closely below.

In the last few years the CA of many microstates has deteriorated in the face of a negative terms of trade shock, implying that economic agents have so far behaved in a manner consistent with the assumption that the terms of trade shock is temporary. It would appear, however, that because the recent shocks stem from lower guaranteed agricultural export prices and textile quotas and probably higher commodity import prices—all of which are likely to be permanent—microstates will have to adjust to the new reality and improve the CA rapidly.

The issue is *how* to adjust. Before explaining what policies would bring the CA back to a more sustainable level after a persistent negative shock, we must first analyze why the CA in microstates is sensitive to terms of trade changes by looking at what makes them different from other countries.

III. Unique Aspects of the Current Account of Microstates

Microstates have unique vulnerabilities that tend to increase the volatility of the CA and worsen it compared to larger states:

1. Due to their size, microstates tend to specialize in fewer activities, which raises the degree of concentration and therefore the volatility of the CA (Ramey and Ramey, 1995). Table 1 illustrates how microstates as a whole have on average a higher export concentration than other countries.

Table 1: Export Concentration Index, 2001

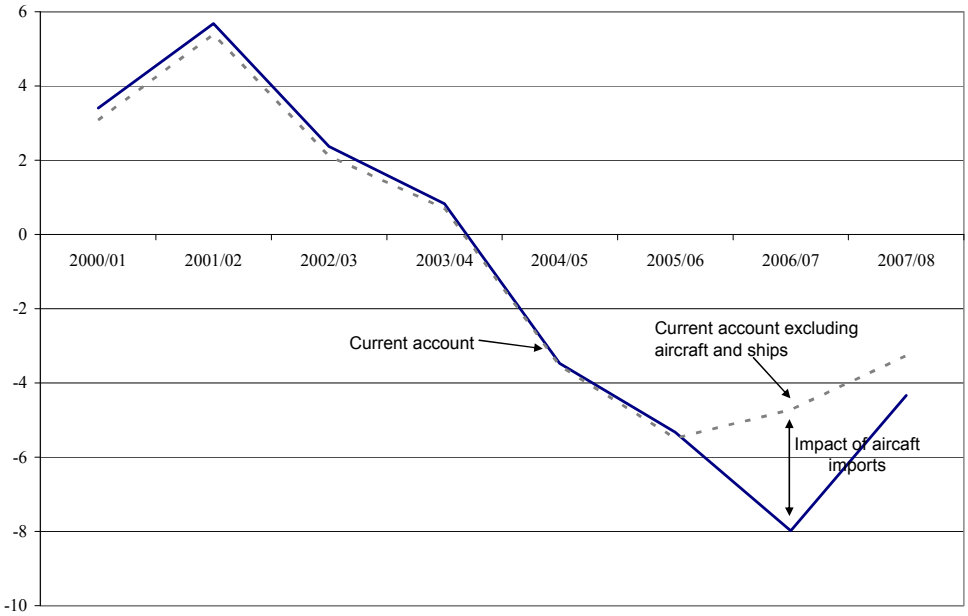
Micro-States	0.28
of which Maldives	0.39
of which Santa Lucia	0.56
of which Swaziland	0.28
Other States	0.23

Source: UNCTAD (2001) "Export Concentration Index" (Country coverage: 55).
The Herfindahl-Hirschmann index normalized to obtain values ranking from 0 to 1.
A higher value indicates a greater degree of export concentration.

Tourism and banking tend to be the main service sectors in microstates; they are often complemented by an indigenous agricultural industry, such as sugar, that is often not competitive. A small population, coupled with a limited domestic market, makes it difficult to diversify into manufacturing activities, though some micro-states, thanks to preferential trade agreements, in particular the MFA, had some textile activities.

2. Because they are small, microstates can suffer from lumpiness of investment. A company investing in a large project has an immediate effect on the CA, making it more volatile than it would be in diversified economies. For example, in 2007 Air Mauritius added two Airbus airplanes to its fleet, worth close to US$300 million, which led to a major deterioration in the current account (see Figure 3).

Figure 3: Mauritius: Current Account With and Without Aircraft and Ship Imports, 2000–2008
(Share of GDP)



Source: IMF staff estimates

3. Despite exceptions like the Bahamas and Luxembourg, microstates typically do not have as much access to capital markets as other states, making it more difficult for them to use the markets to smooth consumption when a shock worsens the CA. Microstates are thus more vulnerable to exogenous shocks and experience more CA volatility. A look at Moody's government bond ratings (2008) suggests that more than half the countries we classify as microstates have no country and government bond rating.[4] While this could

[4] The countries that do not appear in Moody's (2008) ratings include Antigua and Barbuda, Bhutan, Comoros, Cape Verde, Dominica, Djibouti, Equatorial Guinea, Gabon, The Gambia, Guinea-Bissau, Grenada, Guyana, Lesotho, Maldives, Namibia, Netherlands Antilles, São Tomé & Príncipe, Seychelles, Solomon Islands, St. Kitts and Nevis, Swaziland, Vanuatu, and Samoa

be because microstates do not require access to capital markets, it is more likely that access is closed to them.

4. Microstates are often at the geographical periphery, which raises transportation costs. Like other trade barriers, this has the effect of reducing prices received for exports and raising prices of imports (both of which tend to be inelastic in microstates), leading the CA to deteriorate. For example, according to the remoteness index[5] constructed by Djankov, Freund, and Pham (2006), microstates were on average 50 percent more distant from trading partners than other countries (Table 2).

Table 2: Remoteness of Microstates Versus Other States, 2003

Micro-States (1)	0.245
Other States	0.160

(1) includes Botswana, Guyana, Iceland, Maldives, Mauritius, Samoa

Summary Statistics	
No of Observations	125
Mean	0.183
Standard Deviation	0.090
Minimum	0.031
Maximum	0.436

Source: Djankov, Freund and Pham (2006)

5. Since microstates are often small islands in the tropics, they are prone to natural disasters ranging from hurricanes to volcanic disruptions (Srinivasan, 1986). When natural disasters occur, exports often shrink because production capacity is destroyed, and imports rise to repair the damage, worsening the CA. According to a World Bank Vulnerability Index (1998), individuals in microstates are on average about 50 percent more likely to be affected by natural disasters than those in other states (see Table 3).

[5] Djankov et al. (2006) define the remoteness index as $remote_j \equiv \frac{1}{\sum_k^N \frac{GDP_k}{D_{kj}}} = \frac{1}{\frac{GDP_1}{D_{aj}} + \frac{GDP_2}{D_{2j}} + ... + \frac{GDP_j}{D_{jj}} + ... + \frac{GDP_N}{D_{Nj}}}$ where N is the total number of trading partners, D_{jk} is the distance between country *j* and country *k*, and GDP_k is country *k*'s GDP. This index has the advantage, unlike GDP-weighted distance measure, of not giving too much weight to too distant countries.

Table 3: Vulnerability to Natural Disasters, 1970–96

Micro-States	7.52
of which Bahamas	10.43
Botswana	10.16
Swaziland	9.63
Tonga	10.44
Other States	4.95

Vulnerability defined as percent of population affected by natural disasters.
Source: World Bank (1998) "Small States: A Compositve Vulnerability Index"

6. Supplying public goods (such as a bureaucracy or a military), which is subject to economies of scale, may be more expensive in microstates. The public sector as a share of GDP tends therefore to be bigger—a particularly serious problem if the government is badly run (see Table 4). Since government spending is biased toward nontradables, and since historically microstates have had large CA deficits, the CA tends to be structurally more vulnerable in these countries.

Table 4: Government Consumption as a Share of GDP, 2005

Micro-States	21.01
of which Botswana	34.33
of which Swaziland	27.57
of which São Tomé & Príncipe	26.04
Other States	13.40

Source: World Development Indicators

While microstates are likely to be more vulnerable to shocks, they also possess advantages that could help the CA:

1. Most microstates became independent only after World War II, in particular after the 1970s, and have enduring links with their former colonial powers. The larger states are willing to grant them special assistance—such as preferential agreements like the Cotonou and Lomé Agreements with the EU—that acts like a subsidy to the export sector and hence should be favorable to evolution of the CA. Since export prices for many goods produced by microstates were until recently guaranteed (and still are in many countries), export revenues are in principle relatively stable and above international prices.

2. Because microstates tend on average to be racially more homogenous (Alesina, Baqir, and Easterly, 1999)—despite some notable exceptions, such as Mauritius—ethnic fragmentation, which has been linked to lower-quality institutions and worse policies (Alesina and La Ferrara, 2004) may be less of a problem for them (Table 5). For

example, adjustments to shocks are handled more promptly in homogenous societies, where shifting the burden of adjustment onto other socioeconomic groups is not possible (Alesina and Drazen, 1991). This should facilitate the adjustment necessary to reduce the CA deficit.

Table 5: Ethnic Fragmentation

Micro-States	36.2
of which Barbados	22
of which Mauritius	58
of which Botswana	51
Other States	42.3

Ethnic fragmentation measures the probability that two randomly selected individuals in a country belong to a different ethno-linguistic groups. The variables increases with the number of ethno-linguistic groups.
Source: Easterly and Levine (1997)

3. While their geography subjects microstates to weather hazards, it also confers a natural comparative advantage by allowing them to specialize in tourism. This means that microstates have access to export revenues that can be earned without the need for sophisticated indigenous manufacturing or a high knowledge base, which should help the CA.

4. Finally, corruption in the public sector may be less prevalent in microstates, despite (or perhaps because) the fact that officials may be subjected to more conflicting pressures. In microstates government officials tend to personally know individuals affected by their policies, so arguably they could be less likely to implement painful, though necessary, reforms. However, as suggested by the Transparency Index for 2007, corruption in microstates is in fact lower on average than in other states (Table 6). This could reflect the fact that if all the decision makers know each other well, deciding in the interest of the country might be easier because the public would know that decisions are taken with the collective good in mind.

Table 6: Corruption Perception Index, 2007

Micro-States	4.3
of which Barbados	6.9
of which Cap Verde	4.9
of which Guinea-Bissau	2.2
Other States	3.9

The Corruption Perception Index goes from 0-10, with higher numbers implying less corruption.
Source: Transparency International (2007)

IV. "OLD" VERSUS "NEW" VIEW OF THE CURRENT ACCOUNT

Having reviewed the unique aspects of the CA of microstates, the next step is to examine whether a large CA is really worrisome. Corden (1994) distinguished between the "old" CA view and the "new" one. According to the old view, countries cannot run permanent CA deficits, only temporary ones. Therefore, CA deficits matter and will have to adjust eventually. Large and persistent CA deficits often lead to instability because when the external position is unsustainable, investors will exit, causing "sudden stops" or reversal of capital flows (Milesi-Ferretti and Razin, 1998). This has often led to hard landings, abrupt exchange rate depreciations that generated inflation, increases in interest rates to contain inflation, and falls in investment and consumption leading to lower economic activity and rising unemployment. The result can be devastating for the local economy, causing subdued or even negative growth for years. Moreover, in a volatile environment, a country with a low CA deficit, even if it loses access to international capital markets, is less likely to have to adjust rapidly than a country with a large CA deficit—or is likely to need less and is therefore more likely to get it.

Some economists have criticized the view that large persistent CA deficits are likely to lead to crises and have attempted to qualify them based on the origin of the CA deficit. This "new" view differentiates CA deficits that result from public sector deficits from those caused by private economic agents. In this view, CA deficits that are due to changes in the behavior of the private sector, such as changes in investment, should not ring an alarm bell; only CA deficits caused by the public sector should be of concern. Protracted CA deficits orchestrated by the private sector are therefore sustainable. The new view, also known as the "Lawson doctrine," named in the late 1980s after the United Kingdom Chancellor of the Exchequer, was discredited by recent currency crises (and even during the tenure of Lawson himself). The combination of market inefficiencies makes the source of the CA deficit less relevant than suggested by proponents of the new view. Since the Asian crisis the new view has been increasingly challenged. For example, Corsetti, Pesenti, and Roubini (1998), analyzing the period leading up to the Asian crisis, claim that large CA deficits, driven by private investment, were one of the principal factors behind it. "As a group, the countries that came under attack in 1997 appear to have been those with large current account deficits throughout the 1990s ... Prima facie evidence suggests that current account problems may have played a role in the dynamics of the Asian meltdown" (pp. 7–8).

Why is the size of the CA deficit important, even if it is driven by the private sector?

1. Markets in general are concerned with a country's total CA/GDP ratio, regardless of its source, as demonstrated by Iceland in March/April 2008, when the króna suffered a speculative attack even though the public sector deficit was not excessive by international standards. Therefore, even if the budget is in surplus, financial markets might still "punish" countries with large CA deficits driven by the private sector.

2. If the CA deficit is driven by private borrowing, private sector liabilities (e.g., of banks) are often contingent public liabilities, as was the case during the Asian crisis and the current credit crisis. Therefore, the risks of a bankruptcy are likely to fall back eventually on the public sector.

3. A worsening of the CA, driven by borrowing abroad by the private sector, leads to an REER appreciation and can thus lead to suboptimal investment in tradables and lower long-term growth, which could eventually trigger a crisis. This is sometimes considered another driver of the Asian crisis.

4. Where the domestic financial system is not well regulated, private overborrowing because of overoptimistic expectations has often led to excessive and inefficient investment, which historically has been a source of crisis. While the CA deficit in this case would be a symptom of irrational exuberance rather than its direct cause, the excessive CA deficit would likely still lead to a crisis.

These market imperfections help explain why economists like Bergsten (2002) make the case that countries "enter a 'danger zone' of current account unsustainability when their deficits reach 4-5 percent of GDP .... [Then] corrective forces tend to arise either spontaneously from market forces or by policy action." In other words, there is a threshold beyond which adjustment is more likely. Edwards (2005), without being concerned about the source of CA deficits, illustrates that CA deficits of over 5 percentage points of GDP are not sustainable for most countries. Over the last 30 years CA deficits of that magnitude lasting over five years occurred very rarely, and only in small industrial countries like Austria, Denmark, Finland, Greece, and Ireland. History therefore suggests that high CA imbalances cannot be maintained for long and are followed by periods of CA adjustment, typically in response to a crisis. In other words, in microstates tolerance for a large and persistent CA deficit—which manifests itself in a crisis—is probably much lower than in advanced countries, where it would seem manageable. Therefore, to preempt a crisis it is advisable that microstates improve their CA rapidly to protect themselves against problems in turbulent times.

V. RAPID CURRENT ACCOUNT ADJUSTMENT

We use several econometric specifications to estimate the incidence of large CA adjustments — a population-weighted probit, a random effects probit[6], a pooled-OLS, all with similar results indicating that the findings are robust to the model used—and to analyze the economic policies that have been most successful in speedily reducing CA deficits.[7] We posit a model where the dependent variable is a dummy that takes the value 1 for rapid CA improvements after a persistent negative terms of trade shock of at least 10 percent, and 0 otherwise. (Appendix 1

[6] The pooled cross-section and time-series nature of the sample necessitates suggests that the use of random effects probit is the most appropriate estimation procedure, as it enables us to obtain unbiased parameter estimates and consistent standard errors in the face of within unit serial correlation and heteroscedastic standard errors across units.

[7] Scholars still have not come to consensus on the consequences for the real economy of CA adjustments. Milesi-Ferreti and Razin (1998), for example, conclude that adjustments "are not systematically associated with a growth slowdown" (p.303); other studies, such as Frankel and Cavallo (2004), find, however, that sudden stops of capital inflows have slowed growth.

presents the stylized facts of CA adjustments and terms of trade changes.) The CA adjustment is defined as the percentage point change of the CA/GDP over horizon *n*:

$$\Delta CA_{t,n} = CA_{t,t+n} - CA_{t-n,t}$$

Episodes of rapid and large CA adjustment are identified based on the following conditions:

(i) Adjustment is rapid: $CA_{t,t+n} \geq 5 ppa$.[8]

(ii) Adjustment accelerates: $\Delta CA_{t,n} \geq 2$ ppa.

(iii) Post-CA peak exceeds pre-CA peak: $CA_{t,n} \geq \max\{CA_i\}, i \leq t$.

To capture long adjustment episodes meaningfully, we set the time horizon beyond three years (n=4). Together, the three requirements on CA adjustment episodes ensure that we capture sustained reductions of the CA deficit rather than abrupt but short-lived fluctuations. The specification of the model to explain rapid CA improvement draws on the literature of the determinants of the CA (for a thorough review of the literature, see Edwards, 2001). Table 7 presents results for the whole sample and Table 8 for the sample of microstates. We use the following variables[9]:

- *Fiscal balance*: By raising national savings, improvements in the fiscal balance lead to improvement in the CA. Only when there is full Ricardian equivalence, for which there is little empirical evidence (Haque and Montiel, 1989), and public saving is fully offset by private savings, would there be no link between the government budget balance and the CA. (Data from IFS.)

- *Net foreign assets (NFA)/GDP*: High official NFA are expected to have an ambiguous effect on the CA. On the one hand, economies with high NFA can afford to run trade deficits longer, leading to a negative relation between NFA accumulation and CA improvement. On the other hand, other things being equal, economies with high NFA benefit from higher net income flows, which would lead to a positive relationship between NFA accumulation and CA improvement. (Data from WDI.)

- *Domestic credit*: The coefficient is expected to be negative because by raising domestic growth, domestic credit growth is expected to lead to a worsening CA by stimulating import demand. (Data from WDI.)

- *Terms of trade*: The coefficient is expected to be positive. All other things being equal, an improvement in the terms of trade should lead to fewer units of exports needed for each unit of imports. Only in the special case where a country is subject to permanent terms of trade shocks will the CA not be affected, because rational agents will revise

[8] PPA stands for percentage points change per annum.

[9] Variables such as population growth were omitted because short-run country-level variation is insufficient to affect CA substantially.

their expected current and future income downward when the shock is viewed as permanent, and will not change their savings. (Data from IFS.)

- *REER*: The REER is expected to be negative because it would facilitate CA adjustment: An REER depreciation will make exports more attractive (by making them cheaper for foreigners) and imports less attractive (by making them more expensive to residents). It also becomes more profitable to produce importable products domestically. (Data from IFS.)

- *Financial development*: The coefficient is predicted to be negatively correlated with CA adjustment: Countries with more sophisticated financial systems can more easily smooth the CA adjustment by borrowing intertemporally. (Data from WDI.)

- *Openness* should improve the CA because more open countries should be able to adjust imports and exports more rapidly after a shock. Openness was calculated as the sum of exports and imports relative to GDP. (Data from IFS.)

- *The exchange rate regime* is represented by a dummy that takes the value of 1 for fixed exchange rate regimes and 0 otherwise. Domestic prices do not adjust immediately after a negative shock; if the nominal effective exchange rate is not allowed to depreciate, adjustments will not be immediate. The coefficient is expected to be negative. (Data from the AREAER.)

- *Per capita GDP:* The coefficient should be positive, all else being equal. Poorer economies need more investment, which is likely to be financed by borrowing externally; richer countries are more likely to use domestic savings. (Data from IFS.)

- *Per capita GDP growth*: The coefficient should be positive, all else being equal. Stronger economic growth than trading partners should lead to faster import growth. (Data are from IFS.)

- *Natural disasters*: The coefficient is expected to be negative because more imports will be required for disaster relief and to repair damage; exports also are typically negatively affected by disasters. Data on windstorms and earthquakes identify a disaster as occurring when 10 or more people are reported killed; 100 people are reported affected; and there is a call for international assistance and a declaration of a state of emergency. (Data from the Emergency Disasters Data Base [EM-DAT], compiled by the Centre for Research on the Epidemiology of Disasters [CRED]).

Table 7: Current Account Adjustments: Estimation Results, 1970–2005

	All Countries (Random Effects Probit)		All Countries (Population-Weighted Probit)		All Countries (OLS Pooled)
	Coefficients	Marginal Effects	Coefficients	Marginal Effects	Coefficients
Current-Account/GDP$_{t-1}$	-0.0785 ***	-0.078	-0.0719 ***	-0.006	-0.0107 ***
	(0.008)		(0.007)		(0.001)
Budget Balance/GDP	0.0376 ***	0.038	0.0417 ***	0.003	0.0054 ***
	(0.009)		(0.009)		(0.001)
NFA/GDP	-0.0007	-0.001	-0.0005	0.000	0.0000 ***
	(0.001)		(0.001)		(0.000)
Domestic Credit Growth	0.0000	0.000	0.0000	0.000	0.0000
	(0.000)		(0.000)		(0.000)
Δ Terms of Trade $_{t-1}$	0.0016 *	0.002	0.0014 *	0.000	0.0001 *
	(0.001)		(0.001)		(0.000)
Δ RER	-0.0145 ***	-0.014	-0.0139 ***	-0.001	-0.0005 *
	(0.005)		(0.004)		(0.000)
Financial Development $_{t-1}$	0.0017	0.002	0.0017	0.000	0.0002
	(0.003)		(0.002)		(0.000)
Δ Openness	-0.0064 *	-0.006	-0.0137 *	-0.001	-0.0014
	(0.004)		(0.005)		(0.001)
ER-DEFACTO	-0.0253	-0.025	-0.0220	-0.002	-0.0029
	(0.027)		(0.023)		(0.002)
Δ GDP Per Capita	-0.0059	-0.006	-0.0051	0.000	-0.0009
	(0.008)		(0.008)		(0.001)
GDP Per Capita	0.0001	0.000	0.0001	0.000	0.0000
	(0.001)		(0.000)		(0.000)
Earthquake	0.0169 **	0.017	0.0164 **	0.001	0.0017 **
	(0.009)		(0.007)		(0.001)
Windstorm	-0.0204 **	-0.020	-0.0206 **	-0.002	-0.0017 ***
	(0.009)		(0.008)		(0.000)
Constant	-1.8614		-1.7235 ***		0.0640 ***
	(0.183)		(0.145)		(0.014)
No. of Observations	1829		1853		1853
No. of Countries	127		127		127
Pseudo R-square	0.790		0.997		0.145

Source: Author's estimates.

Note: The marginal effects have been computed using the Delta method.

(*) represents significance at 1%, (**) at 5%, and (***) at 10%. Robust standard errors are shown in parentheses.

Table 8: Current Account Adjustments: Estimation Results, 1970–2005

	Small Countries (Random Effects Probit)		Small Countries (Population-Weighted Probit)		Small Countries (OLS Pooled)
	Coefficients	Marginal Effects	Coefficients	Marginal Effects	Coefficients
Current-Account/GDP$_{t-1}$	-0.0555 ***	-0.055	-0.0581 ***	-0.0014	-0.0094 ***
	(0.011)		(0.010)		(0.002)
Budget Balance/GDP	0.0270 **	0.027	0.0278 ***	0.0007	0.0042 *
	(0.011)		(0.011)		(0.002)
NFA/GDP	-0.0005	0.000	-0.0005	0.0000	0.0000 **
	(0.001)		(0.001)		(0.000)
Domestic Credit Growth	0.0010	0.001	0.0012	0.0000	0.0000
	(0.001)		(0.001)		(0.000)
Δ Terms of Trade $_{t-1}$	0.0007 ***	0.001	0.0006	0.0000	0.0000 **
	(0.002)		(0.001)		(0.000)
Δ RER	-0.0020	-0.002	0.0007	0.0000	-0.0004
	(0.013)		(0.014)		(0.002)
Financial Development $_{t-1}$	0.0095	0.009	0.0076	0.0002	0.0010 *
	(0.007)		(0.007)		(0.001)
Δ Openness	-0.0275 ***	-0.028	-0.0217 ***	-0.0005	-0.0034 **
	(0.010)		(0.007)		(0.001)
ER-DEFACTO	-0.0782	-0.078	0.0793	-0.0019	-0.0040
	(0.069)		(0.065)		(0.007)
Δ GDP Per Capita	-0.0558 ***	-0.056	-0.0562 ***	-0.0013	-0.0063 ***
	(0.018)		(0.018)		(0.002)
GDP Per Capita	0.0005	0.000	0.0006	0.0000	0.0001
	(0.001)		(0.001)		(0.000)
Earthquake	0.0036	0.004	0.0033	0.0001	-0.0002
	(0.048)		(0.049)		(0.007)
Windstorm	-0.0332	-0.033	-0.0310	-0.0007	-0.0037 *
	(0.027)		(0.027)		(0.002)
Constant	-1.4694 ***		-1.4166 ***		0.0955 **
	(0.380)		(0.339)		(0.039)
No. of Observations	392		398		398
No. of Countries	30		30		30
Pseudo R-square	0.668		0.996		0.209

Source: Author's estimates.

Note: The marginal effects have been computed using the Delta method.

(*) represents significance at 1%, (**) at 5%, and (***) at 10%. Robust standard errors are shown in parentheses.

The pseudo-R^2 is high for the full sample, which suggests that the estimated model is a good fit. For microstates, most of the findings from theory hold, though the statistical significance is sometimes less robust, in part because the number of observations is lower[10]:

- Coefficients on the lagged CA/GDP are significant and have the right sign. On average, microstates are 6 percent more likely to experience a sharp CA improvement when they had a negative CA balance in the previous period. For other states, the results are similar.[11]

- Rapid CA adjustment is also more likely (by 3 percent) if a country runs a fiscal surplus. This implies that the Ricardian equivalence effect is not large, and that public savings are important in achieving rapid improvements in the CA. The marginal effects are slightly higher for larger economies.

- The coefficient on NFA is negative, though not statistically significant, both for micro- and larger states; this implies that increasing NFA helps finance and sustain a CA deficit.

- An expansive monetary policy, through its effect on domestic credit growth, does not seem to affect the probability of rapid CA recovery, as suggested by the nonsignificant effect of domestic credit growth on CA improvement.

- Improvements in the terms of trade have a positive, statistically significant effect on the CA, as is to be expected from the HLM effect, suggesting that countries subject to positive terms of trade shocks are more likely to rapidly improve their CA. Interestingly, the probability and significance of an improvement in the terms of trade reducing the CA deficit is larger in microstates than in others.

- The impact of REER depreciation on the CA is negligible and not statistically significant in microstates (see below for an extensive discussion). However, the coefficient on the REER for the whole sample implies that an REER depreciation increases the probability that countries will improve the CA rapidly by 1.5 percent. Countries with flexible exchange rates are more likely to experience CA improvements than those with fixed exchange rates, but the effect is statistically insignificant in both samples.

- Financial development is not an important factor in reducing the CA rapidly, either in microstates or larger economies. If the development of the financial system does not

[10] A dummy variable for Kuwait was used because the invasion in 1990 and the Gulf War of 1991 led to huge swings in the CA balance. The results did not change significantly, however.

[11] For the sample as a whole, CA improvement is rapid 8.9 percent of the time. For microstates, the incidence is 14.8 percent, confirming that they adjust much faster than larger countries. This could be because smaller countries have fewer ways to delay adjustments. They might, for example, have less access to capital markets. CA adjustments, while volatile, are high in most years, suggesting that they might be driven more by domestic than international factors.

matter, it may be that economic agents do not access the financial system to smooth consumption.

- Increasing openness has a slightly negative effect on the probability of CA improvement, and largely statistically significant for micro-states, but less so for other countries. This implies that more open economies are not more likely to close the CA deficit than more closed economies.

- While most countries do not see a large change in the CA after a fall in GDP per capita growth, microstates that experience negative growth are prone to see fast CA improvement after a permanent negative terms of trade shock. Falling incomes increase the probability of the CA improving rapidly and are statistically significant. Income per capita does not, in either sample, raise the probability of CA improvement.

- Most surprising, earthquakes and windstorms have opposite effects on fast and large CA improvements. Earthquakes help improve the CA rapidly, windstorms do not. This is surprising; earthquakes might be expected to cause more damage than windstorms and hence lead to a worsening CA. Perhaps areas subject to earthquakes receive enough aid that the CA improves rapidly; whereas windstorms, which are more frequent and can be anticipated a few days ahead, are less destructive and might not lead to much aid, with the result that they have a negative effect on the CA. The two variables do not affect the likelihood of experiencing a rapid CA adjustment in the microstate sample though. [12]

While we would expect from theory that fiscal and exchange rate policies matter in explaining CA adjustment, our results suggest that for microstates the exchange rate channel is not important. The findings that REER depreciation do not matter for microstates are counterintuitive. What could explain this? We argue that microstates have certain features that probably account for much of the explanation: structural features (e.g., limited manufacturing base), institutional factors (e.g., wage rigidities), and pricing policies by multinationals (e.g., pricing to market) probably account for much of the explanation. Let us look at each in turn. [13]

[12] We also tested for the effect of offshore financial centers (OFCs), which could in principle experience more gradual CA adjustments (the list of OFCs was obtained from IMF, 2000). The IMF defines OFCs as "Jurisdictions that have relatively large numbers of financial institutions engaged primarily in business with non-residents; financial systems with external assets and liabilities out of proportion to domestic financial intermediation designed to finance domestic economies; and, more popularly, centers which provide some or all of the following services: low or zero taxation; moderate or light financial regulation; banking secrecy and anonymity." The results are not reported, but the coefficient on the OFC dummy was never statistically significant.

[13] Hedging is unlikely to be an important factor in explaining the limited impact of REER changes on the CA. First, there is limited evidence that economic agents in micro-states have the capacity and ability to hedge. Second, there is only a limited forward market for most of their currencies, suggesting that only a few large companies could potentially hedge their positions. Finally, long-term hedges, over years, rather than just a few months, would be needed to on their own explain the limited pass-through of prices. This instrument is only available for some highly traded currencies.

1. The Marshall-Lerner condition illustrates that devaluations will only help the CA improve if exports and imports are elastic, leading to expenditure switching effects. If, as is likely in microstates, exports—high-end tourism and banking services—and imports—necessities such as food and petroleum—are both inelastic, a devaluation will not improve the CA.[14]

2. The composition of imports and exports in microstates could be a factor explaining the high pass-through, and hence the ineffectiveness of REER depreciations in improving the CA. A disproportionate amount of imports in microstates is made up of *primary goods* that are not produced domestically, such as food and fuel, whose demand tends to be inelastic, as they are typically necessities. The lack of responsiveness of CA deficits to REER depreciations might therefore be due to the limited ability to substitute these necessary imports. Similarly, in most microstates, service-related exports such as tourism and banking, are typically invoiced in foreign currency (usually US dollars or euros), suggesting that devaluation will not make exports cheaper for foreigners, thereby not stimulating the export sector (see also Calvo and Reinhart, 2002).

3. *Manufacturing* imports in micro-states might have very low pass-through, meaning that appreciation of the exchange rate will not make imports cheaper for locals. When there is market segmentation and it is difficult to arbitrage traded goods, producers of tradables will be able to price-discriminate by individual market.[15] Dornbusch (1987) illustrated how this strategy of pricing to market—keeping the prices of exports stable in terms of the importing country's currency—means that the pass-through of import prices is relatively limited because this trade invoicing practice limits the sensitivity of manufacturing import prices to exchange rates (Goldberg and Tille, 2005).[16] Import prices in domestic currency therefore are likely to remain fixed even when the exchange rate has changed substantially. Microstates suffer from the fact that they typically do not have import-competing industries that can produce substitutes for imported goods, enhancing the pricing to market effect. When the pass-through of manufacturing prices is close to zero, there will be limited changes in relative prices and no signal to consumers to change their consumption behaviors. While pricing to market exists in micro- and other states, the extent of it might be higher due to less competition, for

[14] Related to that point, the limited manufacturing base of most micro-states explains why they are unable to substitute importable goods with increased domestic production, compared to other states.

[15] There are two stages of pass-through; from the depreciation of the exchange rates to import prices, and from the change in import prices to retail prices. Exports typically choose to "price to market", they cut their profit margins and prefer their market share, rather than raise prices in accordance with exchange rate changes. The pass-through from import prices to the retail price is made up of non-tradables, notable storage costs etc., that typically account for a large share of the tradable good. As a result, the pass-through of prices tends to be low in many countries.

[16] One would expect that foreign producers would be less reluctant to raise prices in microstates if the domestic currency depreciates because consumers there are likely to have few domestic substitutes for the importable good. In more diversified economies, this threat is likely to keep the price changes in check. Unfortunately, lacking microdata for microstates means we can only hypothesize this. Even Goldberg and Tille (2005) have no sample that covers microstates.

instance. Under these conditions, the price adjustment will not be much affected by REER changes in microstates.

4. The high distribution costs of added to imports once they enter a microstate—including the fact that they do not buy in bulk given the limited domestic demand— further tends to insulate the final consumption price from exchange rate changes of imported goods. Much of the final price of an imported good is made up of nontradables, such as marketing, distribution, or storage costs. According to Campa and Goldberg (2006) these are between 30 and 50 percent for 21 OECD countries, so presumably they are even higher for microstates. Factors like distribution margins are found to move in the direction opposite to exchange rates, falling when the local currency appreciates and rising when the local exchange rate depreciates.[17] Because transport costs are very high for microstates, given their distance from manufacturing centers, the share of distribution costs in final sales price is much higher.

5. In microstates, arguably, real wages are rigid downwards, making devaluation ineffective. One explanation is that workers in economies subject to external shocks need more protection against the shocks, as the economy is less diversified. This can happen either via government spending having a risk-reducing role in economies exposed to a significant amount of external risk (e.g., price controls and subsidies), or via institutions and policies that ensure that devaluation periods are matched by a wage increase to make up for the real wage cut (see Rodrik, 1998). The beneficial effects of a devaluation where real wages are rigid will thus be short-lived. There is anecdoatel evidence in micro-states that real wages do not fall much for long periods of times following exchange rate devaluations.

6. Some microstates, such as Mauritius, are heavily dependent for exports and imports on euro and dollar exchange rate fluctuations. As cross-border production of imports could cancel out some of the exchange rate fluctuations if production of different stages takes place in several countries, this would result in lower pass-through (see Bodnar, Dumas, and Marston, 2002). This again would suggest that REER adjustment would not be expected to matter much for CA adjustments. This argument would apply only to microstates that trade fairly equally with euro-zone and dollar-zone countries.[18]

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[17] It is useful to cite Campa and Goldberg (2006) extensively to view the different layers composing the final price paid by the consumer: "Basic prices are the cost of intermediate consumption plus cost of basic inputs (labor and capital) plus other net taxes linked to production. Producer prices are basic prices plus other net taxes linked to products. Purchaser or final prices are the sum of producer prices and distribution margins (retail trade plus wholesale trade plus transport costs) plus Value Added Taxes. The different tax components are twofold: 'Other taxes linked to production' are those taxes (or subsidies) levied on companies due to the fact that goods are produced but are not linked to the amount produced or sold; 'Other taxes linked to products' are those taxes (or subsidies) levied on companies that are linked to the amount produced or sold. These include VAT tax on the production process, import duties, plus other taxes."(p.14)

[18] Another issue that could matter in microstates is that when the exchange rate depreciates, there is a fear that because both the government and the private sector often have their liabilities in foreign currencies ("liability dollarization"), even if exports rise, the interest rate costs of paying for their foreign currency liabilities more than makes up for this.

While all the explanations provided are potentially important, they are still speculative for microstates, because for data availability reasons most of the research has been done on OECD countries. However, they do plausibly suggest why REER depreciation might be less effective in microstates than in other countries in closing down the CA deficit.

VI. Conclusions and Policy Implications

We have described the stylized facts of CA adjustments after negative terms of trade shocks, distinguishing between microstates and other nations because the former have characteristics that may make them more vulnerable to shocks. They are, for example, less diversified, located at the geographical periphery, and subject to frequent natural disasters, and they have less access to capital markets. These features make the CA vulnerable by penalizing exports and making imports dearer.

Our most significant findings are that for our whole sample, countries are more likely to have large CA adjustments if (i) they are already running large CA deficits; (ii) they run budget surpluses; (iii) the REER depreciates; (iv) the terms of trade improve; and (v) they are less open.. There is evidence that monetary policy, financial development, per capita GDP, declines in GDP growth and the de jure exchange rate classification matter less or not at all. We also find that despite their structural features, microstates do not seem to be very different from other economies in rapidly adjusting the CA. Most of the coefficients have similar probabilities, the same signs, and similar levels of significance. There are notable exceptions:

- Terms of trade improvements are more significant in reducing the CA deficit in microstates, suggesting that external factors beyond government control matter.
- Declines in per capita GDP growth in microstates greatly stimulate CA improvements.[19]
- REER depreciations do not appear to significantly reduce the CA deficits in microstates.

What are the implications of our findings for microstates wishing to rapidly close their CA deficit? What is the optimal policy response to a persistent negative terms of trade shock? Because some of the variables analyzed, such as terms of trade, are exogenous, the government cannot do much to affect them. However, there are still several options to improve the CA rapidly after a terms of trade shock:

1. In microstates, the REER channel does not appear to significantly affect the CA, so unlike in other countries devaluations on their own will not be a remedy for a CA deficit.

2. Therefore, compared to other states, in microstates more of the burden of CA adjustment falls on the government, which must reduce the budget deficit. Raising tax revenues or

[19] The analysis suggests that one alternative option is to have negative per capita income growth. Clearly, this is neither desirable nor advisable, but it should act as a warning that if CA deficits remain too large for too long, the first collateral damage might be falling incomes.

cutting (inefficient) spending would dampen domestic demand. Lower budget deficits therefore would be at the heart of microstate CA adjustment.

3. Diversifying the export base of the country by focusing on sectors that are less affected by international price movements and for which demand is favorable would also enable microstates to rapidly close a CA deficit. This is, however, a long-term policy that is unlikely to be of much use in the short run.

As commodity prices rise and trade preferences are phased out, the CA deficit of many microstates has been deteriorating. A crisis could set back development by years in many of them. Government policies should therefore aim at preventing such a crisis from occurring. This study suggests that possible preventive measures are fiscal consolidation and export diversification. These should rank high on the agenda of microstate policy-makers.

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APPENDIX 1: STYLIZED FACTS ON THE CURRENT ACCOUNT AFTER PERSISTENT TERMS OF TRADE SHOCKS

Identifying Persistent Negative Terms of Trade Shocks[20]

Below we undertake a cross-country analysis of the impact of negative terms of trade shocks on the CA, differentiating between microstates and larger economies. Letting *t* be the period in which the shock occurs, we define a terms of trade shock as *persistent* if the 5-year terms of trade mean over the period [*t-4, t*] differs from the mean over the period [*t+1*, *t+5*] by a predetermined threshold. Initially, the threshold is set to minus 10 percent; as a sensitivity test we increase it to minus 30 percent.[21] Our definition is restrictive; it accounts only for long time horizons.[22]

We analyze the terms of trade series for goods and services for a panel of 159 countries using annual data for 1970–2006 (see Section III for data sources). We identify 228 persistent terms of trade shocks that exceed the 10 percent threshold and 79 that exceed the 30 percent threshold (Table 1). Three main conclusions arise from the analysis: (i) persistent terms of trade shocks have been as common in microstates as in larger ones; (ii) negative and positive shocks are equally frequent in the two subsamples of countries; and (iii) positive shocks have been relatively more frequent in larger than in microstates.

Table 1: Distribution of Persistent Terms of Trade Shocks

	Number of countries	Size and type of shock					
		10 percent			30 percent		
		overall	positive	negative	overall	positive	negative
All	159	228	110	118	79	46	33
Non-Microstates	119	165	74	91	55	30	25
Microstates 1/	40	63	36	27	24	16	8

Source: Author's calculations

1/ Defined as countries with an average population of less than 2 million between 1970-2006

While sizable and persistent terms of trade shocks take place every year, their frequency rose in three periods: toward the end of the 1970s, in the mid-1980s, and in the mid-1990s (Figure 1).

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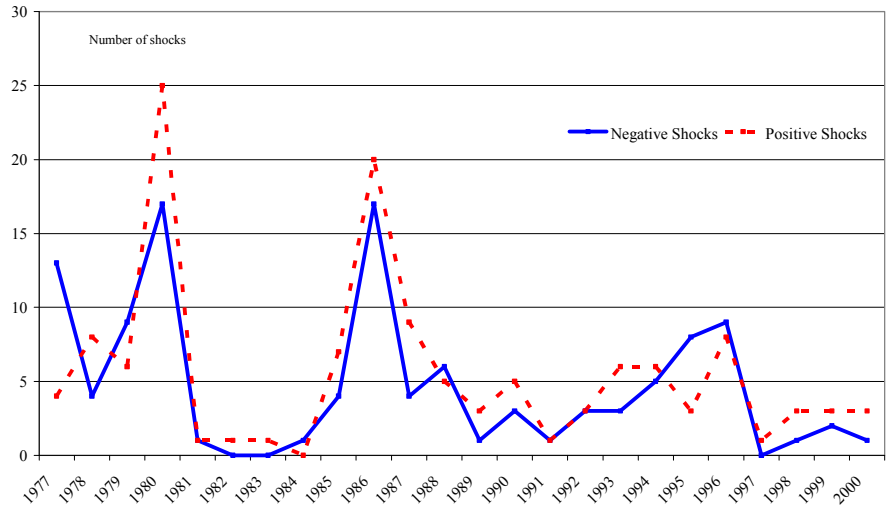
[20] This section draws on Funke, Granziera, and Imam (2008).

[21] The year of the break is defined as the year in which the highest percentage change in the terms of trade in the period *[t-2, t+2]* is recorded. We verify that the mean between the 5 years preceding the shock differs from the mean of the 5 years after by at least the threshold.

[22] Different studies have used different definitions to identify terms of trade shocks. Hausmann, Pritchett, and Rodrik (2006) use the annual change in terms of trade to measure their impact on growth accelerations and decelerations. While useful in explaining shocks, this methodology does not distinguish persistent from temporary shocks. Berg, Ostry, and Zettelmeyer (2006) apply the Bai-Perron test to identify a structural break. The reason we do not do so is that the Bai-Perron test is conservative in detecting breaks, capturing only major collapses and growth jumps. Focusing on large terms of trade changes, Becker and Mauro (2006) use a 10 percent annual change as the threshold, but this has the disadvantage of lumping together short-term and persistent shocks.

The probability of positive and negative terms of trade shocks is to be expected; for example, during oil shocks, oil-exporting countries encounter a positive shock and oil-importing countries a negative one.

Figure 1: Frequency of Positive and Negative Terms of Trade Shocks for All Countries



We analyze the evolution of the CA after a *persistent negative* shock, distinguishing three cases: countries where (i) a negative shock led to improvement in the CA; (ii) the CA remained almost unchanged; and (iii) the CA worsened. Countries where the CA improved by at least 2 percentage points of GDP after a negative shock are deemed "improvement in current account" countries; those where it worsened by at least 2 percentage points are "worsening current account" countries. "Stable" countries are those for which the average CA response was relatively small, between –2 and +2 percentage points of GDP (we also consider 1 and 5 percent responses). Table 2 presents the probability of outcomes of current account changes in the periods before and after a negative terms of trade shock of at least 10 percent.

Current Account After Terms of Trade Changes

It appears that the CA in microstates is more volatile than in larger states, and the swings are larger, particularly those leading to CA worsening (see Table 2). After 10 percent negative shocks, CA adjustments do occur in microstates but improve in two-thirds of the cases and worsen in the rest. For larger countries, shocks of similar size lead to small swings and on average to a small improvement in the CA. After shocks of a magnitude of at least 30 percent—there are eight cases—the CA in microstates swings substantially, worsening in 60 percent of cases and improving in the rest. The 25 negative shock cases in larger states tend to lead to a small improvement in the CA.

Table 2: Current Account Changes Before and After Negative Terms of Trade Shocks of at Least 10 and 30 Percent

(Percent of outcomes)

	Worsening in CA x<-1	Stagnation in CA 1>x>-1	Improvement in CA x>1	Worsening in CA x<-2	Stagnation in CA 2>x>-2	Improvement in CA x>2	Worsening in CA x<-5	Stagnation in CA 5>x>-5	Improvement in CA x>5
Microstates									
10 Percent Shock (91 shocks)									
Negative Shock	0.40	0.13	0.47	0.33	0.20	0.47	0.33	0.33	0.33
30 Percent Shock (25 shocks)									
Negative Shock	0.60	0.00	0.40	0.60	0.00	0.40	0.40	0.40	0.20
Non-Microstates									
10 Percent Shock (27 shocks)									
Negative Shock	0.28	0.26	0.47	0.19	0.52	0.29	0.02	0.79	0.19
30 Percent Shock (8 shocks)									
Negative Shock	0.13	0.33	0.53	0.07	0.73	0.20	0.00	0.87	0.13

Source: Authors' estimates.