The End of Large Current Account Deficits, 1970-2002: Are There Lessons for the United States?

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Introduction

When Alan Greenspan was appointed chairman of the Federal Reserve in 1987, the United States was running a current account deficit of 3.4 percent of gross domestic product (GDP). This was considered to be very large figure at the time. During the next three years, the current account deficit declined substantially, and by fourth quarter of 2004, it had shrunk to 1 percent of GDP. In 1991, and partially because of foreign contributions to the financing of the Gulf War, the United States posted a current account surplus of 0.7 percent of GDP. By the second quarter of 1992, the current account was again in deficit. Since then the deficit has grown steadily to its current level of approximately 6 percent of GDP.

A number of analysts have become increasingly alarmed by this very large and growing external imbalance. Some authors have argued that by relying on foreign central banks' purchases of government securities, the United States has become vulnerable to changes in expectations and economic sentiments. If capital flowing into the United States were to stop suddenly, it is argued, there would be a large depreciation of the dollar and, as a consequence, higher inflationary pressures. This would force the Federal Reserve to act decisively, hiking the federal funds rate

significantly.[1] This, the story goes, would result in a recession in the United States and in a slowdown of the world economy.[2] The belief that a significant external adjustment and a large decline in the dollar are unavoidable is based on reasoning along the following lines: At approximately 6 percent of GDP, the U.S. current account deficit is clearly unsustainable; thus, in the next few years, the deficit has to be cut approximately in half. In a recent paper, Mussa has said:

> *[T]here is probably a practical upper limit for the U.S. net external liabilities at something less than 100 percent of U.S. GDP and, accordingly...current account deficits of 5 percent or more of U.S. GDP are not indefinitely sustainable. (Mussa, 2004, p 114).*

From policy and empirical points of view, an important question is whether these developments—a significant real depreciation, higher interest rates, and a sharp decline in GDP growth—are indeed necessary outcomes of a current account reversal of the type many analysts forecast for the United States during the next few years. In principle, the *real* consequences of a current account reversal will depend on a number of factors, including whether the reversal is abrupt or gradual, whether the country is large or small, and whether the country is open to the rest of the world. According to standard theory, gradual reductions in the current account deficit do not have to be costly. In addition, current account adjustments in large and very open countries are expected to have different consequences than in smaller and more closed economies.

The purpose of this paper is to analyze the international evidence on current account reversals during the period 1971-2001. Although the U.S. case is unique, an analysis of the international experience will provide some light on the likely nature of a future U.S. current account adjustment. In particular, this research will provide information on whether a significant current account reversal would entail a decline in growth and, thus, an increase in unemployment.[3] Previous studies on the (real) consequences of current account reversals have generated conflicting results. After analyzing the evidence from a large

number of countries, Milesi-Ferreti and Razin (2000) concluded that major current account reversals have not been costly. According to them, "reversals…are not systematically associated with a growth slowdown" (p. 303). Frankel and Cavallo (2004), on the other hand, concluded that sudden stops of capital inflows (a phenomenon closely related to reversals) have resulted in growth slowdown.[4] In this paper, I analyze several aspects of current account reversals, including:[5]

- The incidence of current account reversals in different regions and groups of countries.
- The relationship between reversals and "sudden stops" of capital inflows.
- The relation between current account reversals and exchange rate depreciation.
- The relation between current account reversals and interest rates.
- The relation between current account reversals and inflation.
- The factors determining the probability of a country experiencing a current account reversal.
- The costs—in terms of growth slowdown—of current account reversals.

In analyzing these issues, I have relied on two complementary statistical approaches. First, I use non-parametric tests to analyze the incidence and main characteristics of current account reversals. And second, I use panel regression-based analyses to estimate the probability of experiencing a current account reversal, and the cost of such reversal in terms of (short-term) declines in GDP growth. Although the data set covers all regions in the world, throughout most of the paper I emphasize the experiences of large countries and industrial countries.

The rest of the paper is organized as follows. In the second section, I provide some background information on the U.S. current account. The analysis deals both with historical trends, as well as with recent developments. I show that there are no modern historical precedents of

a large country, such as the United States, running persistent and very large current account deficits. In the third section, I use a cross-country data set to analyze the international evidence on current account reversals. I use non-parametric tests to analyze the behavior of interest rates, exchange rates, terms of trade, and economic growth in the period following a current account reversal. I use two alternative definitions of reversals, and I investigate whether the speed of the adjustment matters. In the fourth section, I use panel regression techniques to investigate two important issues: (a) what determines the probability that a country will experience a reversal; and (b) whether countries that have experienced reversals have faced real costs in the form of a decline in the rate of GDP growth. In this analysis, I explicitly deal with potential endogeneity problems by estimating an instrumental variables version of a treatment regression. In the fifth section, I discuss the U.S. current account adjustment of 1987-1991. Although this episode does not qualify as a "reversal," as defined in this paper, it is the closest the United States has been to a major current account reduction in modern times. Finally, in the sixth section, I present some concluding remarks. The paper also has a statistical appendix.

The U.S. current account imbalance: An unprecedented story

In this section, I provide some background information on the evolution of the U.S. current account during the last 30 years. The analysis is divided in three parts. First, I deal with long-term trends, and I discuss briefly the relation between the current account and the real exchange rate. Second, I focus on the more recent period, and I discuss the evolution and funding of the current account and its components during the last few years. Finally, I take a comparative perspective, and I compare the recent evolution of the U.S. current account and net international investment position with that of other countries. I show that no other large country in modern times has run a persistently large current account deficit of a magnitude (measured as percentage of GDP) similar to that posted by the United States. This lack of other historical cases makes the analysis of the current U.S. situation particularly interesting and difficult.

A long-run perspective

In Chart 1, I present quarterly data for the U.S. current account balance as a percentage of GDP for the period 1973-2004.[6] I also include data on the evolution of the Federal Reserve's trade-weighted index of the real exchange rate (RER) of the U.S. dollar (an increase in the RER index represents a real exchange rate appreciation).[7] Several interesting features emerge from this chart:

- First, it shows that deficits have become increasingly large since 1992.
- Second, Chart 1 shows that for the first decade of floating exchange rates (1973-1982), the United States ran, on average, a small current account surplus of 0.04 percent of GDP. In contrast, for the period 1983-2004 the mean current account balance has been a deficit of 2.4 percent of GDP.
- Chart 1 also shows that during the period under consideration, the RER index experienced significant gyrations.
- Finally, Chart 1 shows a pattern of negative correlation between the trade-weighted real value of the dollar and the current account balance. Periods of strong dollar have tended to coincide with periods of (larger) current account deficits. Although the relation is not one-to-one, the degree of synchronicity between the two variables is quite high: the contemporaneous coefficient of correlation between the (log of the) RER index and the current account balance is -0.53; the highest correlation of coefficient is obtained when the log of the RER is lagged three quarters (-0.60).

In Chart 2, I disaggregate the data on the current account into four categories: (a) the balance of trade of goods and services as a percentage of GDP; (b) the balance of trade in (nonfinancial) services as a percentage of GDP; (c) the income account, also as a percentage of GDP; and (d) the transfers account as a percentage of GDP. As may be seen in panel A, large and persistent trade deficits preceded in time the era of large current account deficits. Already in the late 1970s, the trade account was negative, and since mid-1976, it has had only one

Chart 1

Current Account Balance and Real Exchange Rate

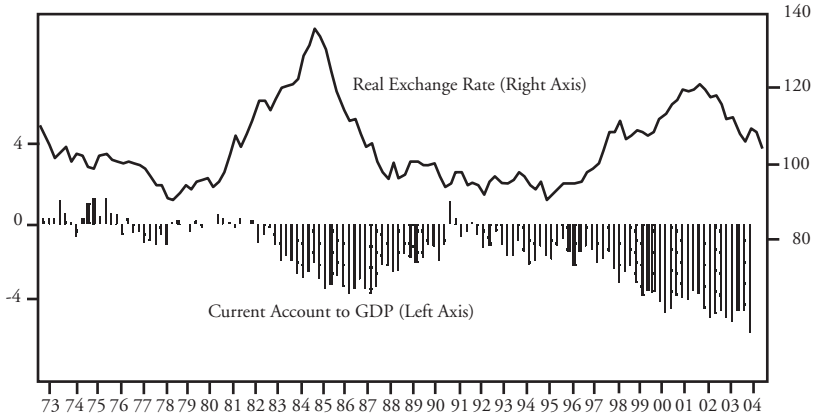
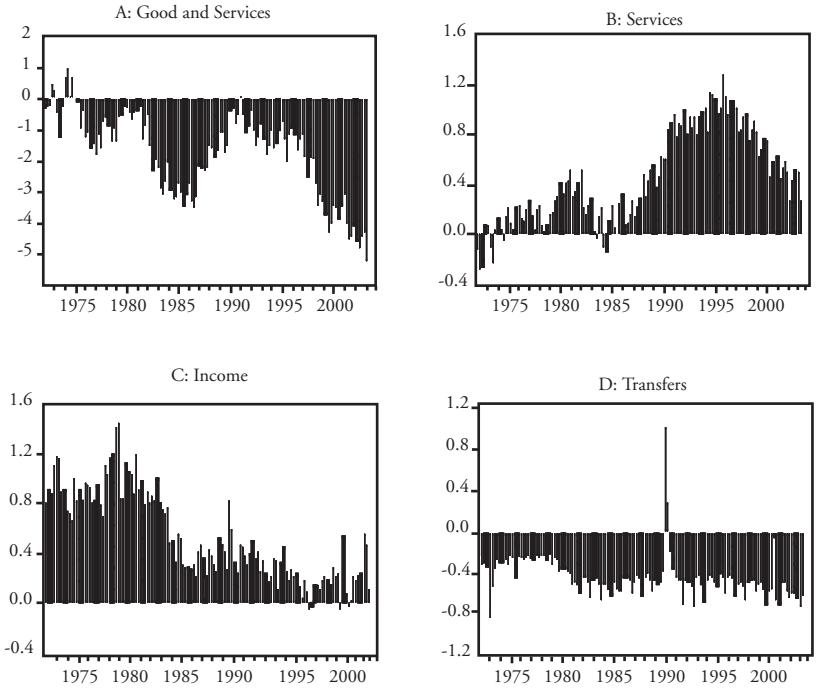


Chart 2
Components of Current Account Deficit, 1973-2004 (Percent of GDP)



Source: International Transactions, Economic Report of President, 2005

surplus quarter (1992Q2).[8] Panel B shows that since 1996, the surplus in (nonfinancial) services has declined steadily; in 2004 it was only 0.3 percent of GDP. As Panel C shows, the income account has been positive throughout the 1973-2004 period. To some extent, this is surprising since for quite some years now the U.S. international investment position has been negative (that is, the United States has been a net debtor). The reason for the positive income account is that the return on U.S. assets held by foreigners has been systematically lower than the return on foreign assets in the hands of U.S. nationals. Finally, panel D shows that, with the exception of one quarter, the transfers account has been negative since 1973; during the last few years it has been stable at approximately 0.7 percent of GDP.

Recent imbalances

In Table 1, I present data on the current account as a percentage of GDP and its financing for the period 1990-2004. As may be seen during the last few years, the nature of external financing has changed significantly. Since 2002, net FDI flows have been negative; this contrasts with the 1997-2001 period when FDI flow contributed in an important way to deficit financing. Also, after four years on net positive equity flows (1998-2002), these became negative in 2003-2004. As the figures in Table 1 show, during 2003 and 2004, the U.S. current account deficit was fully financed through net fixed income flows and, in particular, through official foreign purchases of government securities.[9]

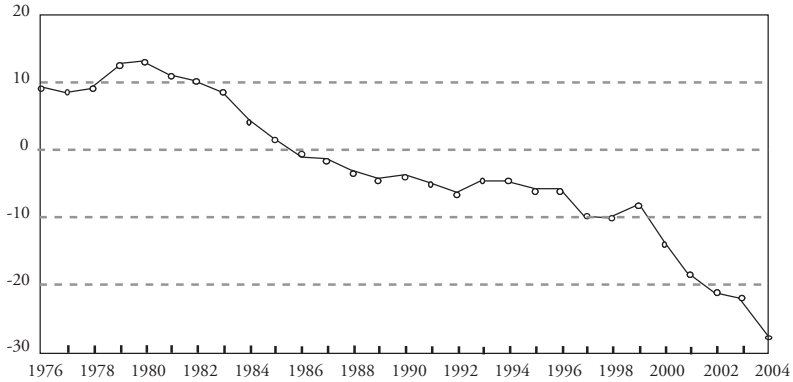
In Chart 3, I present the evolution of the U.S. net international investment position (NIIP) as percentage of GDP. As may be seen, this has become increasingly negative: in 2004, U.S. net international liabilities reached 29 percent of GDP. An important feature of the NIIP is that gross U.S. international assets and gross U.S. international liabilities are held in different currencies. While more than 70 percent of gross foreign assets held by U.S. nationals are denominated in foreign currency, approximately 95 percent of gross U.S. liabilities in hands of foreigners are denominated in U.S. dollars. This means that *net* liabilities as a percentage of GDP are subject to "valuation

Table 1
U.S. Net Financial Flows, 1990-2004
($ Billion)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Reserves (net)	31.8	23.2	44.4	70.4	44.9	100.1	133.4	18.0	-26.7	52.3	42.5	23.1	110.3	250.1	358.1
Foreign private purchases of U.S. Treasuries	-2.5	18.8	37.1	24.4	34.3	91.5	147.0	130.4	28.6	-44.5	-70.0	-14.4	100.4	113.4	108.1
Currency	18.8	15.4	13.4	18.9	23.4	12.3	17.4	24.8	16.6	22.4	5.3	23.8	21.5	16.6	14.8
Securities (net)	-27.2	-10.5	-19.1	-66.2	-6.2	-45.1	-46.0	44.6	32.1	182.6	338.0	309.2	301.4	178.6	323.2
Debt securities	-	-	-	-	-	-	13.0	84.2	145.5	104.2	267.7	300.3	269.8	241.8	360.1
Equity securities	-	-	-	-	-	-	-36.8	24.7	-30.3	84.5	93.0	12.6	37.5	-63.2	-36.8
FDI (net)	11.3	-14.7	-28.4	-32.6	-34.0	-41.0	-5.4	0.8	36.4	64.5	162.1	24.7	-62.4	-133.9	-133.0
Claims reported by non-banks (net)	17.3	8.0	13.2	11.3	-35.0	14.4	-32.6	-5.2	-15.1	-21.5	31.9	57.6	32.6	55.1	-41.5
Claims reported by banks (net)	8.6	3.4	37.4	55.7	100.1	-44.9	-75.1	7.9	4.2	-22.0	-31.7	-7.5	66.1	65.2	-15.6
Net financing	58.0	43.5	97.9	81.8	127.4	87.3	138.7	221.3	76.2	233.8	478.0	416.6	569.9	542.7	614.0
Current account deficit	79.0	-3.7	48.0	82.0	118.0	109.5	120.2	136.0	209.6	296.8	413.4	385.7	473.9	530.7	665.9

Source: BEA, U.S. International Transactions, and International Investment Position

Chart 3
U.S. Net International Investment Position, 1976-2004
(Percent of GDP)



Source: BEA, International Investment Position

effects" stemming from changes in the value of the dollar. Dollar depreciation reduces the value of net liabilities; a dollar appreciation, on the other hand, increases the dollar value of U.S. net liabilities. Because of this valuation effect, the deterioration of the U.S. NIIP during 2002-2004 was significantly smaller than the accumulated current account deficit during those two years (see Table 2 for details).

An important policy question refers to the "reasonable" long-run equilibrium value of the ratio of U.S. net international liabilities to GDP; the higher this ratio, the higher will be the "sustainable" current account deficit. According to some authors, the current ratio of almost 30 percent of GDP is excessive, while others believe that a NIIP to GDP ratio of up to 50 percent would be reasonable.[10]

From an accounting point of view, the current account is the difference between savings and investment. A number of authors have argued that a worsening of a current account balance that stems from an increase in investment is very different from one that results from a decline in national savings. Some have gone as far as arguing that very large deficits in the current account "don't matter," as long as they are the result of higher (private sector) investment (Corden, 1994). Chart 4 shows that the recent deterioration of the U.S. current

Table 2

U.S. Net International Investment Position and Current Acccount Deficit, 1998-2004
($ Billion)

	1998	1999	2000	2001	2002	2003	2004
NIIP	900.0	775.5	1388.7	1889.7	2233.0	2430.7	--
Change in NIIP	79.3	-124.5	613.3	500.9	343.3	197.7	--
Current account deficit	209.5	296.8	413.4	385.7	473.9	530.7	665.7
Valuation changes	130.2	421.3	-199.8	-115.2	130.6	333.0	--

Source: Bureau of Economic Analysis

account has been largely the result of a decline in national savings and, in particular, of public and household savings. Some analysts have argued that the recent decline in U.S. savings has been, at least partially, the result of the Fed's policy of (very) low interest rates. According to this view, low interest rates have helped fuel very rapid increases in housing prices and a concomitant process of "mortgage extraction." This has resulted in a decline in household savings to historically low levels. This, plus the decline in government savings, is behind the increase in the current account deficit.[11]

A simple implication of this trend—and one that is emphasized by most authors—is that an improvement in the U.S. current account situation not only will imply a RER adjustment; it also will require an increase in the national savings ratio and, in particular, in household savings. Symmetrically, a correction of current global imbalances also will require a decline in Europe's and Japan's savings rates and/or an increase in their investment rates.[12]

The U.S. current account deficit in international perspective

In Table 3, I present data on the distribution of current account balances in the world economy, as well as in six groups of nations—Industrialized, Latin America, Asia, Middle East, Africa, and Eastern Europe—for the period 1970-2001. As may be seen, at almost 6 percent of GDP, the U.S. deficit is *very large* from a historical and comparative perspective. It is in the top decile of deficits distribution for all industrial countries in the first 30 years of floating. As the data

Chart 4
U.S. Investment and Savings, 1970-2003
(Percent of GDP)

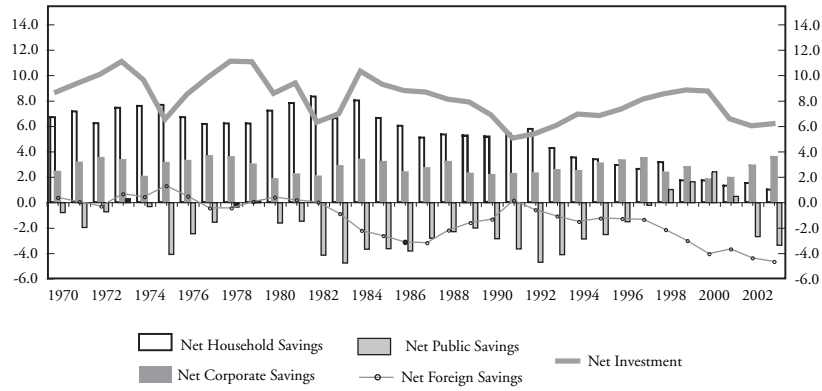


Table 3

Distribution of Current Account Deficits by Region, 1970-2001

Region	Mean	Median	1st Perc.	1st Quartile	3rd Quartile	9th Perc.
			A: 1970-2001			
Industrialized countries	0.6	0.7	-3.8	-1.6	3.0	4.8
Latin Am. and Caribbean	5.4	4.1	-2.5	1.1	8.0	16.9
Asia	3.0	2.7	-7.1	-0.6	6.3	11.3
Africa	6.3	5.3	-3.4	1.2	9.9	16.9
Middle East	0.0	1.4	-18.8	-5.0	6.4	13.6
Eastern Europe	3.9	3.0	-2.4	0.3	6.1	10.7
Total	3.9	3.3	-5.0	-0.1	7.1	13.1

Source: Author's elaboration based on World Development Indicators

in Table 3 suggest, the U.S. looks more like a Latin American or Asian country than like an industrial nation.

Since 1970, the U.S. has been the only *large* industrial country that has run current account deficits in excess of 5 percent. This reflects the unique position that the United States has in the international financial system, where its assets have been in high demand, allowing it to run high and persistent deficits. On the other hand, this fact also suggests that the United States is moving into uncharted waters. As Obstfeld and Rogoff (2004, 2005), among others, have pointed out,

if the deficit continues at its current level, in 25 years the U.S. net international liabilities will surpass the levels observed by any country in modern times.

During the last 30 years, only small industrial countries have had current account deficits in excess of 5 percent of GDP: Australia, Austria, Denmark, Finland, Greece, Iceland, Ireland, Malta, New Zealand, Norway, and Portugal. What is even more striking is that very few countries—either industrial or emerging—have had *persistently high* current account deficits for more than five years. In Table 4, I present a list of countries with *persistently high* current account deficits for 1970-2001. In constructing this table, I define a country as having a "high deficit" if, in a particular year, its current account deficit is in its region's 10th decile.[13] I then defined a "persistently high-deficit country," as a country with a high deficit (as defined above) for at least five consecutive years.[14] As may be seen in Table 4, the list of persistently high-deficit countries is extremely short, and none of these countries is large. This illustrates the fact that, historically, periods of high current account imbalances have tended to be short-lived and have been followed by periods of current account adjustments.

In Table 5, I present data on net international liabilities as a percentage of GDP for a group of advanced countries that historically have had a large negative NIIP position.[15] As may be seen, the picture that emerges from this table is quite different than that in Table 4 on current account deficits. Indeed, a number of advanced nations have had—and continue to have—a significantly larger net international liabilities position than the United States. This suggests that, at least in principle, the U.S. NIIP could continue to deteriorate for some time into the future. However, even if this does happen, at some point this process would have to end, and the U.S. net international liabilities position as percentage of GDP would have to stabilize. It makes a big difference, however, at what level U.S. net international liabilities do stabilize. For example, if in the steady state, foreigners are willing to hold the equivalent of 35 percent of U.S. GDP in the form of net U.S. assets, the United States could sustain a current

Table 4

List of Countries with Persistently High Current Account Deficits by Region, 1970-2001

Region/Country	Period
Industrialized countries	
Ireland	1978-1984
New Zealand	1984-1988
Latin America and Caribbean	
Guyana	1979-1985
Nicaragua	1984-1990 and 1992-2000
Asia	
Bhutan	1982-1989
Africa	
Guinea-Bissau	1982-1993
Lesotho	1995-2000
Eastern Europe	
Azerbaijan	1995-1999

Source: Author's elaboration based on World Development Indicators

Table 5

Net Stock of Liabilities: United States and other Industrial Countries, Selected Years

(Percent of GDP)

Country	1980	1985	1990	1995	2000	2003
Australia	--	--	47.4	55.1	65.2	59.1
Canada	34.7	36.3	38.0	42.4	30.6	20.6
Denmark	--	--	--	26.5	21.5	13.0
Finland	14.6	19.0	29.2	42.3	58.2	35.9
Iceland	--	--	48.2	49.8	55.5	66.0
New Zealand	--	--	88.7	76.6	120.8	131.0
Sweden	--	20.9	26.6	41.9	36.7	26.5
United States	-12.9	-1.3	4.2	6.2	14.1	22.1

Source: Bureau of Economic Analysis, Lane and Milesi-Ferretti (2001)

account deficit of (only) 2.1 percent of GDP.[16] If, on the other hand, foreigners' net demand for U.S. assets grows to 60 percent of GDP—which, as shown in Table 5, is approximately the level of (net) foreign holdings of Australian assets—the U.S. sustainable current account deficit would be 3.6 percent of GDP. Moreover, if foreigners' are willing to hold (net) U.S. assets for the equivalent of 100 percent of GDP—a figure that Mussa (2004) considers implausible—the sustainable U.S. current account deficit can be as high as 6 percent of GDP, approximately its current level. Since there are no historical precedents for a large advanced nation running persistently large deficits, it is extremely difficult to have a clear idea on what will be the actual evolution of foreigners' demand for U.S. assets.

It is worth noting that an analysis for a longer period of time confirms the view that the recent magnitude of the current account deficit has no historical precedent in the United States. According to Backus and Lambert (2005), the United States ran a current account deficit of 5 percent of GDP in 1815, and a somewhat smaller but persistent deficit during the 1830s and 1870s. Greenspan (2004, p. 6) has pointed out that the large deficits during the 19th century were financed with capital flows related to "specific major development projects (such as railroads)."

On current account reversals: An international comparative analysis

Most recent analyses have concluded that the current level of the U.S. current account deficit is unsustainable in the long run. Even under an optimistic scenario, where foreigners' demand for U.S. securities doubles from its current level, there would have to be a significant decline in the deficit. For example, if the (negative) NIIP were to go from its current level of 30 percent of GDP to 60 percent of GDP, the sustainable current account deficit would be 3.6 percent. This is almost three percentage points below its current level. In reality, however, the adjustment is likely to be even larger. The reason for this is that in order for the NIIP to go from -30 percent to -60 percent of GDP in a reasonable period of time, the current account deficit needs to overshoot its steady-state level by a significant margin.

In Edwards (2005a), I present a model where the NIIP reaches 60 percent of GDP after 7 years; in this case, the current account deficit continues to increase, until it reaches a peak of 7.1 percent of GDP. It then declines until it converges to 3.6 percent of GDP. According to this work, and other recent models summarized in Table 6, at some point in time, the United States will undergo a significant current account adjustment. Although no one seems to know when this adjustment will actually take place, almost every analyst agrees that it will have to take place.

A key question is what will be the nature of this adjustment process? In this section, I address this issue by analyzing the international experience with current account reversals in the period 1970-2001. Although the U.S. case is unique—both because of the size of its economy and because the dollar is the main vehicle currency in the world—an analysis of the international experience will provide *some* light on the likely nature of the adjustment. A particularly important question is whether this adjustment will entail real costs in the form of lower growth and higher unemployment.

In Table 7, I present a summary of previous studies on the real consequences of current account reversals and "sudden stops" in capital inflows (a phenomenon closely related to reversals). As may be seen, these studies have used different samples, different time periods, and slightly different definitions of reversals. These studies also have reached different results. For instance, after analyzing the evidence from a large number of countries, Milesi-Ferreti and Razin (2000) concluded that major current account reversals have not been costly. According to them, "reversals…are not systematically associated with a growth slowdown" (p. 303). Frankel and Cavallo (2004) concluded that sudden stops of capital inflows (a phenomenon closely related to reversals) have resulted in growth slowdown, while Crocke, Kamin, and Leduc (2005) argue that there is no evidence suggesting that reversals historically have been associated with growth slowdown (see Table 7 for details).[17]

Table 6

U.S. Current Account Adjustment and the U.S. Dollar: Selected Studies, 1999-2005

Authors	Methodology	Main Assumptions	Main Results
Mann (1999)	• Model tracks U.S. NIIP through time.	• Income elasticity of imports (1.7) exceeds income elasticity of exports (1.0).	• In base case scenario, the NIIP becomes increasingly negative and the CA is unsustainable in the medium run.
	• Analyzes trajectory of NIIP under three scenarios and asks whether these trajectories are sustainable.	• Base case *scenario* assumes no RER adjustment for the USD.	• Under RER depreciation scenario, CA is within sustainable ranges even in a 10-year *long horizon*.
	• Elasticities-based adjustment mechanism.	• A USD adjustment *scenario* assumes an RER depreciation of 25 percent.	• Under structural adjustment, CA deficit is 3 percent in a 10-year horizon, if the global economy has high performance.
	• Considers two scenarios for global growth.	• A structural adjustment *scenario* assumes that exports' elasticity increases to 1.3.	
Obstfeld and Rogoff (2000)	• Develops and calibrates optimizing model of small economy, with two goods: tradable and nontradable.	• Elasticity of substitution between tradables and nontradables is assumed to be equal to one.	• Base case result indicates that an elimination of the CA deficit will imply a 16 percent RER depreciation, and a 12 percent nominal depreciation of the USD.
	• Output is exogenous; prices are assumed to be flexible; monetary policy stabilizes the price level.	• Assumes a 6 percent nominal interest rate, and a NIIP of 20 percent of GDP.	• Assuming a share of tradables equal to 15percent, results in a RER depreciation of 20 percent.
	• Analyzes the effect on RER of an exogenous shock that results in a reduction of the CA deficit of 4.4 percent of GDP.	• Tradables output is assumed to be 25 percent of GDP. • Assumes that full-employment is maintained.	• The effect on the nominal value of the USD could be even higher if the reduction in the CA is very rapid.
O'Neill and Hatzious (2002)	• Analyzes the trajectory of NIIP as a percentage of GDP.	• Analyzes the rates of return obtained by foreign owners of U.S. assets.	• It is unlikely that United States will be able to continue to attract foreign purchasing for its assets at observed low rates of return. Thus, the U.S. CA deficit is clearly unsustainable.
	• Argues that at the observed levels of CA deficits, the NIIP is moving toward the levels of Canada, Australia, and New Zealand. It is difficult to believe that this is possible for a large country such as the United States.	• Argues that, with the exception of FDI, these rates of return have been modest. • Shows that FDI has declined significantly as a source of financing of the U.S. CA deficit.	• A return to sustainability (2 percent of GDP) will imply a depreciation of the RER of as much as 43 percent.
	• Estimates "required" RER depreciation in order to bring CA deficit to 2 percent and NIIP not to surpass 40 percent.		

Table 6 (cont.)

Authors	Methodology	Main Assumptions	Main Results
Wren-Lewis (2004)	• Calibrates a partial equilibrium model to obtain set of bilateral RER consistent with attaining certain (exogenous) current account deficits. • No attempt is made to determine what is the sustainable level of the U.S. current account. • Considers the effect of a U.S. fiscal shock and of a U.S. technological shock.	• To determine initial conditions, author estimates "underlying" (or cycle-adjusted) CA balances. • Considers three possible long-term scenarios: 1 percent, 2 percent, and 3 percent CA deficit. • Three-good partial equilibrium model (including a nontraded) of small economy. • Elasticities and other parameter values taken from regression analysis and from OECD data set.	• CA deficit of 2 percent of GDP is consistent with a yen/dollar rate of 88, and a dollar/euro of 1.18. • If there is a positive technological shock, the "sustainable" CA deficit may be higher. This would be consistent a yen/dollar rate of 89-100 and a dollar/euro rate of 1.11-1.19. • Estimates that if China has a CA surplus of 1 percent of of GDP, the Rmb/USD would be 6.71.
Benassy-Quere and others (2004)	• Estimates econometrically RER path consistent with nontradable equilibrium. • The RER is assumed to depend on the country's net foreign assets (NFA) position and on relative productivity.	• Model estimated simultaneously for 15 currencies. • Data on NFA obtained from Lane and Milessi-Ferreti (2004) and relative productivities obtained as ratio of CPI to PPI. • No attempt is made to impose external equilibrium condition. • Results provided for two cases: USD as numeraire and euro as numeraire.	• The extent of misalignment of the different currencies depends on how broad is the adjustment. • Using the USD as numeraire, estimates that in 2003, the euro was undervalued between 1.2 percent and 7.6 percent. • Using the USD as numeraire, estimates that in 2001, the yen was undervalued between 14.3 percent and 22.1 percent.
Mussa (2004)	• Analyzes trajectory of NIIP and argues that it is unlikely that it will continue to grow at current pace. If it did, it would reach 100 percent of GDP. • Argues that challenge is for RER adjustment to be gradual and that it does not disrupt growth. • Argues that fiscal adjustment in the United States is necessary for smooth correction of imbalances. • No attempt is made at calculating the "outer limit" of U.S. NIIP. • Analyzes the RER adjustment compatible with a gradual reduction of the CA deficit to 2 percent of GDP and a NIIP between 40 percent and 50 percent.	• Based on results from large econometric models, assumes that a 1 percent reduction of the U.S. CA deficit is associated with a 10 percent depreciation of the RER.	• Relative to its value in mid-2004, Mussa calculates that RER will have to depreciate another 20 percent to achieve a long-term CA deficit of 2%. • Discusses policies that will assist the adjustment process: (a) Fiscal consolidation in the United States will help keep U.S. demand growing below the pace of output growth. (b) Monetary policy in Europe and Japan should be more expansive. • Concludes that "some" international policy cooperation is likely to help the adjustment process.

Table 6 (cont.)

Authors	Methodology	Main Assumptions	Main Results
O'Neill and Hatzious (2004)	• Update of O'Neill and Hatzious (2002) model. • Analyzes the trajectory of NIIP as a percentage of GDP and finds that path is not sustainable. • Introduces the role of productivity gains to original framework. • Analyzes the composition of capital flows into the United States. • Incorporates the role of valuation effects.	• Estimates a trade balance equation and uses the coefficients to compute the "required" RER depreciation to achieve different CA adjustment targets. • Trade equation also includes foreign and U.S. demand growth.	• A reduction of the CA deficit to 3 percent would imply RER depreciation of the order of 21.6 percent to 23.6 percent. • A reduction of the CA deficit to 2 percent would imply RER depreciation of the order of 32.1 percent to 34.1percent. • An elimination of the CA deficit to 2 percent would imply RER depreciation of the order of 53 percent to 55 percent. (Notice that these figures are signifigantly higher than those estimated by Obstfeld and Rogoff, 2004).
Obstfeld and Rogoff (2004)	• Extension of the Obstfeld-Rogoff (2002) model to a two-country world. • Terms of trade are now endogenous. • Incorporates the effects of valuation effects of exchange rate changes on NIIP. • Exercise assumes an elimination of the CA deficit; that is a reduction in 5 percent of GDP.	• Ratio of CA deficit to tradables is 25%; CA deficit is 5% of GDP. • Output is exogenously given in both countries. • NIIP is 20 percent of GDP. • Home country produces 22 percent of world tradables. • Simulation is done for alternative values of elasticities, and under different assumptions regarding changes in tradables output and military spending.	• Assuming constant output, an elimination of the CA deficit implies RER depreciation between 14.7 percent and 33.6 percent. • If tradables output increases by 20%, the RER depreciation ranges from 9.8 percent to to 22.5 percent. • If there is a permanent increase in military expenditure, the RER depreciation ranges from 16.0 percent to 36.1 percent
Roubini and Setser (2004)	• Uses macro aggregate model to project the U.S. current account. • Imposes exogenous assumptions on RER and analyzes CA path.	• First scenario considers a constant RER dollar. • Second scenario considers a constant trade deficit at 5 percent of GDP, and a RER depreciation of approximately 7 percent. • Third scenario considers a faster rate of growth of exports, and substantial (50 percent) depreciation. This scenario also assumes a gradual elimination (by 2012) of the fiscal deficit.	• In first scenario, CA deficit 13 percent of GDP in 2012. • In second scenario, CA deficit 9 percent of GDP in 2012. • In third scenario, the NIIP stabilizes at approximately 55 percent of GDP and the CA deficit declines gradually, reaching 4.3 percent of GDP in 2012.

Table 6 (cont.)

Authors	Methodology	Main Assumptions	Main Results
Blanchard, Giavazzi, and Sa (2005)	• Uses portfolio model to analyze U.S. current account behavior. • Assumes changes in portfolio preferences in world economy.	• Considers dynamics of adjustment. • Considers valuation effects of changes in the U.S. dollar. • Simulates model under certain assumptions for values of key parameters (elasticities, portfolio shares, and other). • The question asked is, What is the required (real) depreciation of the U.S. dollar to eliminate the current account deficit?	• Estimates range of required U.S. dollar real depreciation (today). After incorporating the role of valuation effects, the range is estimated to be between 40 percent and 90 percent real depreciation.

In this section, I analyze several aspects of current account reversals, including:[18]

- The incidence of current account reversals in different regions and groups of countries.
- The relationship between reversals and "sudden stops" of capital inflows.
- The relationship between current account reversals and exchange rate depreciation.
- The relationship between current account reversals and interest rates.
- The relationship between current account reversals and inflation.
- The factors determining the probability of a country experiencing a current account reversal.
- The costs—in terms of growth slowdown—of current account reversals.

In analyzing these issues, I rely on two complementary statistical approaches. First, I use nonparametric tests to analyze the incidence and main characteristics of current account reversals. And second, I use panel regression-based analyses to estimate the probability of experiencing a current account reversal, and the cost of such reversal,

Table 7

Current Account Reversals and Sudden Stops (Selected Studies)

Author	Definition	Sample	Methodology	Main Results
		A. Current Account Reversals		
Milesi-Ferretti and Razin (2000)	Reduction in the deficit of at least 3 (5) percentage points of GDP over a period of three years with respect to three years before the event. Maximum deficit after the reversal must be no larger than the minimum deficit in the three years preceding the reversal. The average deficit must be reduced by at least one-third.	105 low- and middle-income countries: 1970-1996	Carries out a before and after study for key economic variables. Estimates a multivariate Probit model for determinants of the probability Estimates a model for studying GDP and export growth three years after a CAR occurs.	Both domestic and external factors affect the probability of CAR. Countries with less-appreciated RER, higher investment, and openness prior to the reversal of occurrence of CAR. tend to grow faster after a CAR. Reversals are not systematically associated with a growth slowdown.
Edwards (2002)	Reduction in the deficit of at least 3 percentage points of GDP in one year. Reduction in the deficit of at least 3 percentage points of GDP in a three-year period.	149 countries: 1970-1997	Estimates a treatment effect model for studying the determinants of CARs and the impact of CARs on economic growth and investment.	CAR have a negative effect on aggregate investment and GDP per capita growth.
Edwards (2005b)	Reduction in the deficit of at least 4 percentage points of GDP in one year. Reduction in the deficit of at least 6 percentage points of GDP in a three-year period.	157 countries: 1970-2001	Analyzes empirically the determinants of CAR and its impact on economic growth using a two-step procedure. Distinguishes the impact of CAR on large countries to discuss implications for the recent U.S. current account imbalances.	Confirms previous results that CAR reduces economic growth. The negative impact of CAR on growth has been in the range of 2.1 to 1.4 percentage points in industrial countries (in the first year of the adjustment).

Table 7 (cont.)

Author	Definition	Sample	Methodology	Main Results
		A. Current Account Reversals (cont.)		
Debelle and Galati (2005)	Reduction in the deficit of at least 2 percentage points of GDP over three years.	21 industrial countries: 1974-2003	Before and after study of 21 episodes of CAR incorporating as control group countries in which current account widened sharply but without reversing in the following years. In contrast to similar studies for industrial countries, it analyzes the dynamics of financial account in CAR episodes. It examines the adjustment of the U.S. current account in the late 1980s.	Does not find systematic evidence of a relationship between current account adjustments and output growth and exchange rates changes. There is not a clear association between CAR and the behavior of capital flows. The experience of the United States in 1987 has notable differences to similar episodes in other industrial countries, particularly in the role played by official flows.
Freund and Warnock (2005)	Deficit exceeded 2 percent of GDP before the reversal. Reduction in deficit of at least 2 percentage points of GDP over three years (from the minimum to the centered three-year average). Maximum deficit in the five years after reversal was not larger than minimum in the three years before. Deficit was reduced by at least one-third.	High-income OECD countries: 1980-2003	Estimates a multivariate model for 26 CAR episodes for studying its impact on relative GDP growth, real exchange rate, and the extent to which the deficit is resolved in the three years following the CAR. Incorporates the role for the size of the current trough, the persistence of the deficits, spending composition, openness, and the net foreign asset position.	CAR tends to be associated with slow economic growth and a real depreciation. Finds little evidence that persistence of deficits, larger net foreign debt positions. Larger short-term capital flows, or lower openness, increase the impact of CAR on growth and exchange rate adjustment.

Table 7 (cont.)

Author	Definition	Sample	Methodology	Main Results
		A. Current Account Reversals (cont.)		
Adalet and Eichengreen (2005)	Reduction in deficit of at least 2 (3) percentage points of GDP between the first three and second three years. Maximum deficit in second three years must be no larger than minimum deficit in first three years. Average deficit must fall by at least a third (as a percentage of GDP) between the first three and second three years.	49 countries: 1880-1988	Measures frequency, magnitude, and effects of CAR, for different periods. Probit and treatment effects model for estimating the consequences of CAR on relative-to-world GDP growth in a three-year after period (included year of reversal).	Incidence of reversals has been unusually great in recent years. Gold standard era and the years since 1970 differ significantly from one another. CARs were smaller, less frequent, and less disruptive in the gold standard period.
Croke, Kamin, and Leduc (2005)	Deficit exceeded 2 percent of GDP before the reversal. Reduction in deficit of at least 2 percentage points of GDP over three years (from the minimum to the centered three-year average). Maximum deficit in the five years after reversal was not larger than minimum in the three years before. Deficit was reduced by at least one-third.	23 episodes of CAR in industrial countries since 1980.	Carries out a before and after study for key economic variables. Distinguishes between episodes according to whether GDP growth was increased or reduced.	Shortfall in growth for contraction episodes appears to reflect the playing out of standard cyclical developments rather than a response to CAR. Episodes of contraction were not associated with significant and sustained depreciations of real exchange rates, increases in real interest rates, or declines in real stock prices.

Table 7 (cont.)

Author	Definition	Sample	Methodology	Main Results
			B. Sudden Stops	
Calvo, Izquierdo, and Mejias (2004)	Year-on-year fall in capital flows lies at least two standard deviations below its sample mean. SS phase ends once the annual change in capital flows exceeds one standard deviation below its sample mean. Start of a SS phase is determined by the first time the annual change in capital flows falls one standard deviation below its sample mean. Adds a criterion of costly disruption in economic activity, defined as a contraction in output.	32 countries, 15 emerging markets, and 17 developed economies: 1990-2001	Develops a model for determining the required change in real exchange rate to adjust the current account deficit. Using panel probit and linear probability models, studies which factors determine the occurrence of a sudden stop. There is a particular emphasis on the impact of openness and domestic liability dollarization. Model is estimated for all countries and emerging markets.	Large real exchange rate fluctuations in SS episodes are an emerging phenomenon. Openness coupled with domestic liability dollarization is key determinant of the probability of SS. Interaction of lower openness and high dollarization increase the negative impact of SS.
Guidotti, Sturzenegger, and Villar (2004)	Year-on-year fall in capital account lies at least one standard deviation below its sample mean. Capital account contraction exceeds 5 percent of GDP. Do not restrict the cases to those in which output falls.	All countries in the world: 1974-2002	Studies incidence and main empirical regularities associated with sudden stops. Distinguishes between SS that require or do not require a domestic current account adjustment. Pooled regressions for studying the impact of SS on economic growth. Look at what country characteristics might make a SS less costly.	The impact of SS on economic performance differs dramatically across countries. Open economies and those with floating exchange rate regimes recover fairly quickly, whereas liability dollarization slows the recovery.

Table 7 Cont.

Author	Definition	Sample	Methodology	Main Results
			B. Sudden Stops (cont.)	
Frankel and Cavallo (2004)	Four different definitions of SS for large and unexpected fall in capital inflows accompanied by output contraction. Year-on-year fall in capital flows lies at least two standard deviations below its sample or decade mean. SS ends once the annual change in capital flows exceeds one standard deviation below its sample mean.	141 countries: 1970-2002	Instrumental variables Probit and OLS regressions for studying determinants of SS and currency crises. Predicted trade from a gravity equation is used as instrument for country trade openness.	Trade openness makes countries less vulnerable to sudden stops and currency crises, and the relationship is even stronger when correcting for the endogeneity of international trade.

in terms of short-term declines in output growth. Although the data set covers all regions in the world, in the discussion presented in this section, and in an effort to shed light on the U.S. case, I emphasize the experience of large countries and industrial countries.

Current account reversals during 1970-2001: The international evidence

I consider two definitions of current account reversals. The first one considers a reduction in the current account deficit of at least 4 percent of GDP in a one-year period, and an accumulated reduction of at least 5 percent of GDP in three years. This definition is called "reversal 4 percent." The second definition considers a reduction in the current account deficit of at least 2 percent of GDP in one year, with an accumulated reduction in three years of 5 percent of GDP. This definition is called "reversal 2 percent."[19] In the reversal 4 percent definition, the adjustment is front-loaded, while in the first one, it is more evenly distributed through time. In Chart 5, I present data on the number of reversals by country group for the years 1971-2001.

In Table 8, I present data on the incidence for both definitions of current account reversals for the complete sample as well as for six groups of countries. As may be seen, for the overall sample, the incidence of reversals is 6.5 percent and 9.4 percent, for reversal 4 percent and reversal 2 percent, respectively. The incidence of reversals among the industrial countries is much smaller, however, at 1.3 percent and 3.3 percent for reversal 4 percent and reversal 2 percent. The Pearson-χ^2 and F-tests reported in Table 8 indicate that the hypothesis of equal incidence of reversals across regions is rejected strongly.

The advanced countries that have experienced current account reversal 4 percent are:

- Greece (1986),
- Italy (1975),
- Malta (1997),
- New Zealand (1975),

- Norway (1978, 1989),
- Portugal (1982, 1983, 1985).

The industrial (or advanced) countries that have experienced current account reversal 2 percent are:

- Denmark (1997),
- Finland (1976, 1977, 1993, 1994),
- Greece (1986),
- Iceland (1993),
- Ireland (1982),
- Italy (1975),
- Malta (1997),
- New Zealand (1976, 1986, 1988),
- Norway (1978, 1979, 1980, 1989),
- Portugal (1977, 1978, 1982, 1984, 1985, 1986),
- Spain (1977),
- Sweden (1994).

With the exception of Italy, all of these countries are very small indeed; this underlies the point that there are no historical precedents of large countries undergoing profound current account adjustments. As pointed out above, this implies that the results reported in this paper on current account reversals should be interpreted with a grain of salt, and should not be mechanically extended to the case of the United States.

The data analysis presented has distinguished countries by their stage of development and geographical location. An alternative way of dividing the sample—and one that is particularly relevant for the discussion of possible lessons for the United States—is by country

Chart 5

Number of Reversals by Country Group

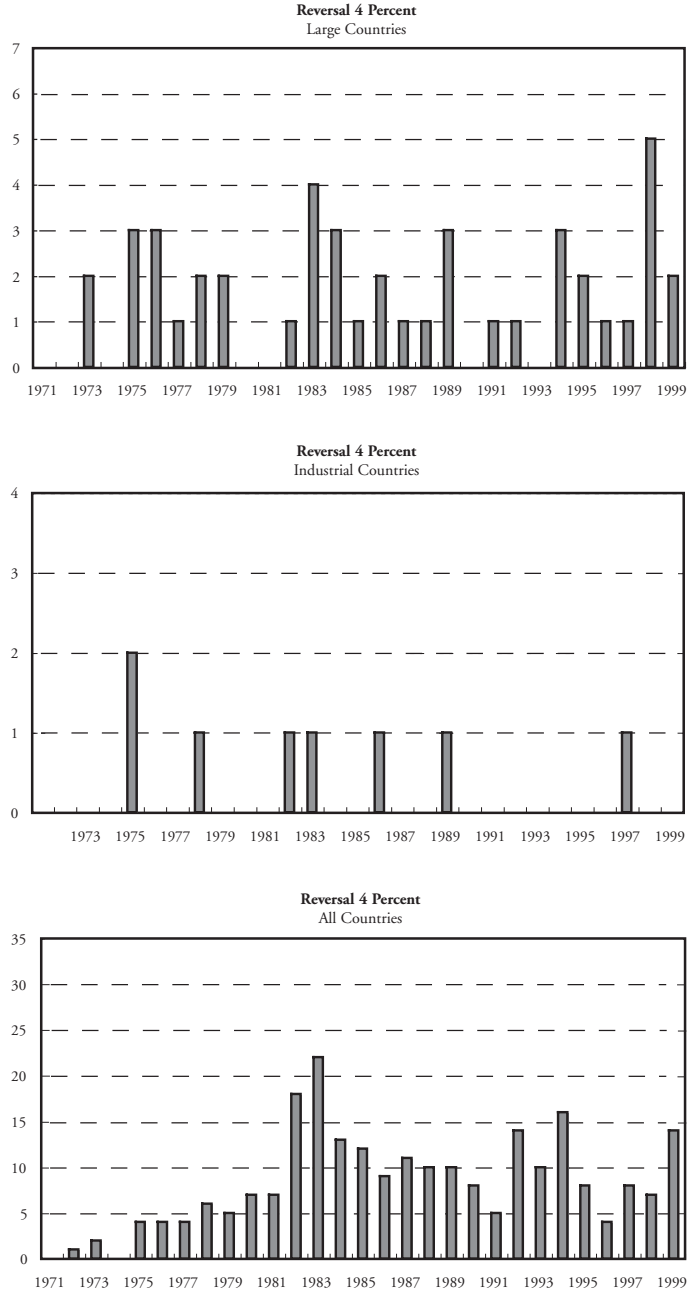


Chart 5 (cont.)

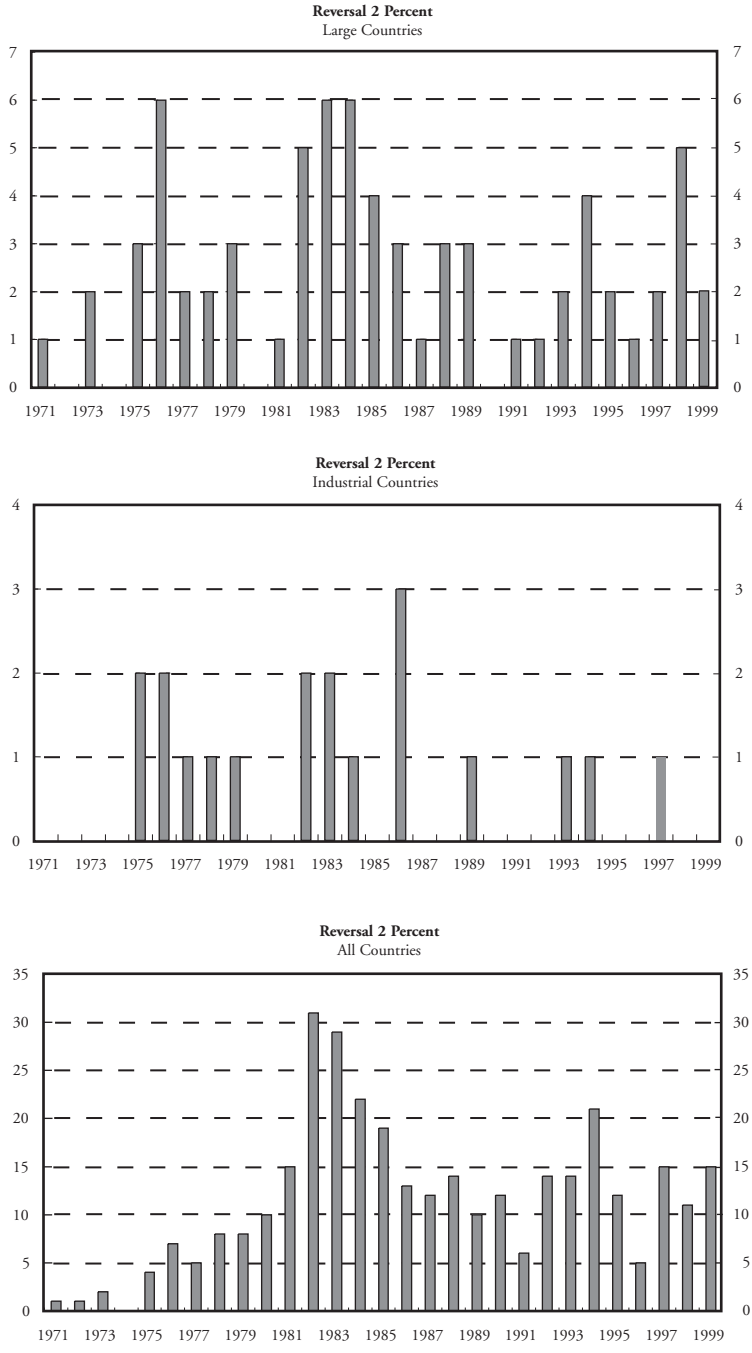

Reversal 2 Percent
Large Countries
0
1
2
3
4
5
6
7
1971 1973 1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999
Reversal 2 Percent
Industrial Countries
0
1
2
3
4
1971 1973 1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999
Reversal 2 Percent
All Countries
0
5
10
15
20
25
30
35
1971 1973 1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999

Table 8
Incidence of Current Account Reversals, 1970-2001
(Percentages)

Region	Type of Reversal	
	Reversal 4 Percent	Reversal 2 Percent
Industrial countries	1.3	3.3
Latin America and Caribbean	5.5	9.4
Asia	8.2	10.7
Africa	8.8	11.9
Middle East	10.4	14.9
Eastern Europe	5.9	7.3
Total	6.5	9.4
Pearson		
Uncorrected chi2 (5)	33.8	33.7
Design-based F(5, 12500)	6.8	6.7
P-value	0.00	0.00

Source: Author's elaboration based on World Development Indicators

size. I define "large countries" as those having a GDP in the top 25 percent of the distribution in 1995 (according to this criterion, there are 44 large countries in the sample). The incidence of reversal 4 percent among large countries is 3.9 percent for 1971-2001; the incidence of reversal 2 percent among large countries is 6.3 percent.

Current account reversals and sudden stops of capital inflows

Since the mid-1990s, a number of authors have analyzed episodes of "sudden stops" of capital inflows.[20] Although from an analytical perspective sudden stops and current account reversals are closely related, there is no reason for this relationship to be one-to-one. If there are changes in international reserves, it is perfectly possible that a country that suffers a sudden stop does not experience, at the same time, a current account reversal. In countries with floating exchange rates, however, changes in international reserves tend to be relatively small, and the relation between sudden stops and reversals should be stronger.

I defined a "sudden stop" episode as an abrupt and major reduction in capital inflows to a country that up to that time had been receiving large volumes of foreign capital. More specifically, an episode is defined as a sudden stop if the following two conditions are met: (1) the country in question must have received an inflow of capital (relative to GDP) larger than its region's third quartile during the two years prior to the sudden stop, and (2) net capital inflows must have declined by at least 5 percent of GDP in one year.[21]

In Table 9, I present data on the incidence of sudden stops and current account reversals (I use both definitions of reversal) for three samples: (a) large countries, defined as those countries whose GDP is in the top quartile of the distribution; (b) industrial countries; and (c) the complete sample. Table 9 shows that for the complete sample, 37.7 percent of countries subject to a sudden stop also faced a reversal 4 percent current account reversal. At the same time, 34.9 percent of those with reversal 4 percent also experienced (in the same year) a sudden stop of capital inflows. Panel C also shows that 45 percent of countries subject to a sudden stop faced a reversal 4 percent current account reversal. Also, 30.5 percent of those with reversal 2 percent experienced (in the same year) a sudden stop of capital inflows. The χ^2 tests reported in Table 9 indicate that for all countries in the sample, the hypothesis of independence between reversals and sudden stops is rejected. The results for industrial and large countries are quite similar. For both samples, the χ^2 test indicates that the null hypothesis of independence between the two phenomena cannot be rejected. An analysis of the lead-lag structure of reversals and sudden stops suggest that sudden stops tend to occur either before or at the same time—that is, during the same year—as current account reversals. Indeed, according to a series of nonparametric χ^2 tests, it is possible to reject the hypothesis that current account reversals precede sudden stops.

Current account reversals and exchange rates

An important policy question—and one that is particularly relevant within the context of current policy debate in the United States—is whether current account reversals historically have been associated

Table 9

Incidence of Current Account Reversals and Sudden Stops, 1970-2001

(Percentages)

Country Group	Reversal 4 Percent	Reversal 2 Percent
A. Large countries		
Reversal | sudden	22.2	28.9
Sudden | reversal	25.6	21.1
$\chi^2(1)$	43.7	44.4
P-value	0.00	0.00
B. Industrial countries		
Reversal | sudden	9.5	14.3
Sudden | reversal	25.0	15.8
$\chi^2(1)$	10.3	8.05
P-value	0.00	0.00
C. All countries		
Reversal | sudden	37.7	45.0
Sudden | reversal	34.9	30.5
$\chi^2(1)$	275.1	274.7
P-value	0.00	0.00

x | y denotes the probability of occurrence of *x* given the occurrence of *y*.
Source: Author's elaboration based on World Development Indicators

with large exchange rate depreciations.[22] In Chart 6, I present the evolution of the median nominal exchange rate (with respect to the U.S. dollar) in reversal countries. These data are presented as an index with a value of 100 the year of the reversal. The data are centered on the year of the reversal; they go from three years prior to the current account reversal to three years after the reversals. In this chart, a lower value of the index reflects a *nominal depreciation*. As may be seen, in all three samples—large, industrial, and all countries—there is a nominal depreciation in the period surrounding the reversal. These depreciations range from 14 percent to 40 percent, depending on the sample and the definition of reversal. In most emerging countries, a large depreciation tends to have a short-run contractionary effect on GDP growth. The reason for this is that in most of these countries, many debts are expressed in foreign currency. Thus, currency depreciation tends to have a "balance sheet" effect, increasing the domestic currency value of these debts.[23]

Chart 6
Evolution of Nominal Exchange Rate
(Median)

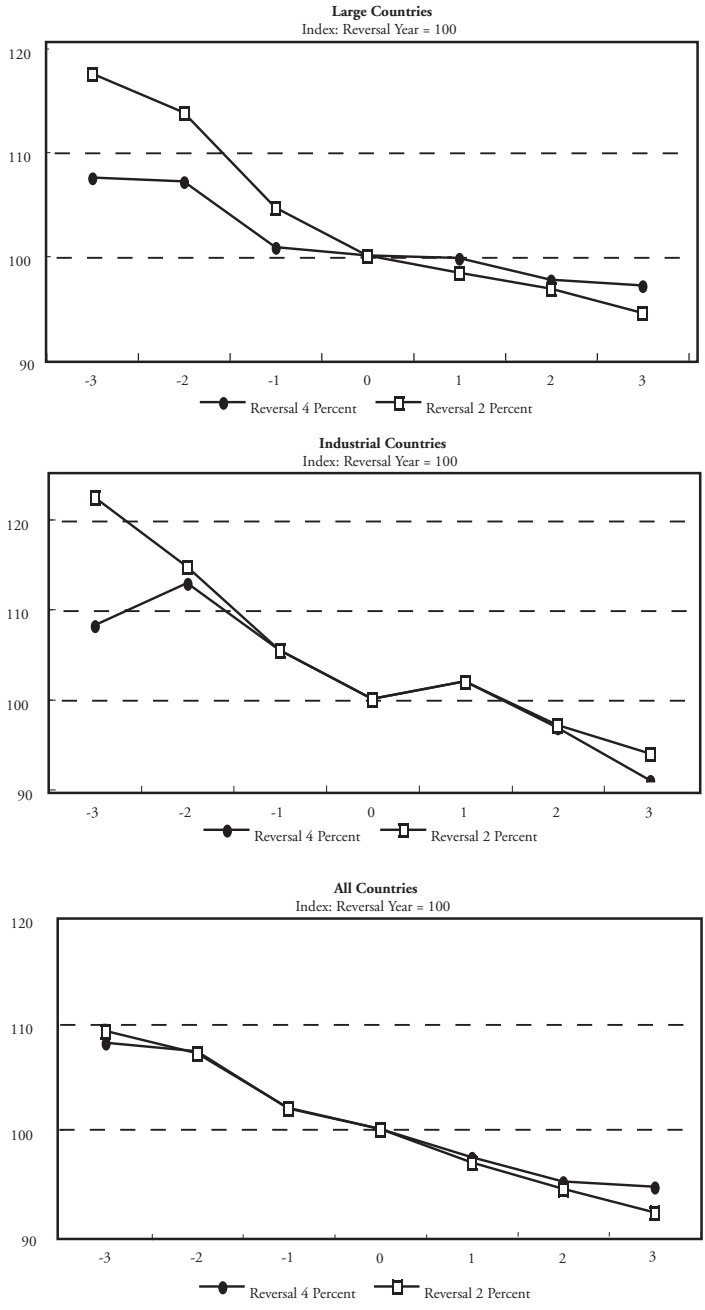


Chart 7 shows the behavior of the (median) real effective exchange rate index. As before, a decline in the index is a real depreciation. As may be seen, for the "large countries" sample, there is a real exchange rate depreciation the year of the reversal, with respect to the year before the adjustment. Moreover, for this sample of large countries, the RER continues to depreciate during the next three years. The accumulated (median) RER depreciation between years -1 and +3 is 8.7 percent for the reversal 4 percent definition of reversal; it is 11.8 percent for reversal 2 percent. Chart 6 also shows that there is an RER depreciation in the "industrial countries" sample. In this case, however, there is an overshooting, and the maximum depreciation is achieved one year after the reversal—it is 7.2 percent for reversal 4 percent and 5.2 percent for reversal 2 percent episodes. Finally, the last panel in Chart 6 shows that for the "all countries" sample, there are no significant changes in (median) RER behavior in the +/-3 years that surround a current account reversal.

For comparison purposes, and in order to gain further insights, I constructed a dataset for a "control group" of countries that have not experienced a current account reversal. I then computed a battery of χ^2 tests for the equality of distributions (Kruskal-Wallis tests) between the reversal countries and the control group.[24] The results from these tests are presented in Table 10 (p-values in parentheses).[25] As may be seen, these χ^2 tests show that nominal exchange rates have behaved differently in the reversal countries and in the control group countries—this is the case independently of the reversal group one looks at. They also show that, for the "large countries" sample, RERs have behaved differently in the reversal and control group countries.

The exchange rate adjustments in the reversal countries reported in Charts 6 and 7 are relatively small when compared with the "required" exchange rate depreciation that has been calculated in a number of studies, including those summarized in Table 6. Obstfeld and Rogoff (2004), for example, estimate that eliminating the U.S. current account deficit would imply a (real) depreciation of between 16 percent and 36 percent. Blanchard, Giavazzi, and Sa (2005) have estimated a required depreciation of the U.S. trade-weighted dollar in

Chart 7
Evolution of Effective Real Exchange Rate
(Median)

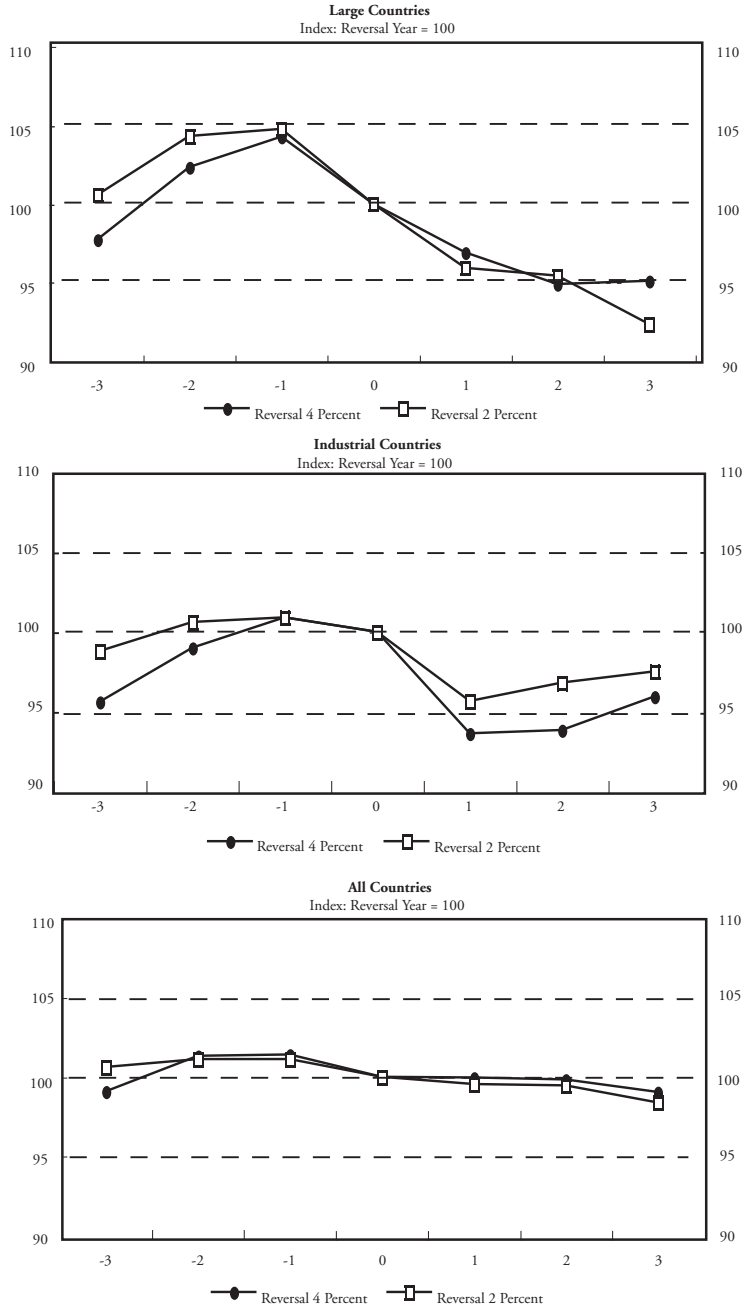


Table 10
Kruskal-Wallis Test

Country Group	One Year Before and Reversal Year		Three Years Before and Three Years After Reversal	
	Reversal 4 Percent	Reversal 2 Percent	Reversal 4 Percent	Reversal 2 Percent
		Nominal Exchange Rate		
Large countries	6.58	9.45	15.60	14.79
	(0.01)*	(0.00)*	(0.00)*	(0.01)*
Industrial countries	2.03	2.98	3.53	2.38
	(0.15)	(0.08)*	(0.06)*	(0.12)
All countries	26.17	44.61	56.50	28.20
	(0.00)*	(0.00)*	(0.00)*	(0.00)*
		Effective Real Exchange Rate		
Large countries	5.73	6.01	9.56	5.62
	(0.01)*	(0.01)*	(0.00)*	(0.02)*
Industrial countries	1.56	0.21	0.11	1.90
	(0.21)	(0.65)	(0.74)	(0.17)
All countries	7.26	13.30	13.84	6.36
	(0.00)*	(0.00)*	(0.00)*	(0.01)*
		Inflation Rate		
Large countries	4.88	1.29	0.05	14.19
	(0.03)*	(0.26)	(0.82)	(0.00)*
Industrial countries	5.45	1.59	0.29	8.18
	(0.02)*	(0.21)	(0.59)	(0.00)*
All countries	18.73	0.99	5.13	16.67
	(0.00)*	(0.32)	(0.02)*	(0.00)*
		Nominal Interest Rate		
Large countries	14.72	4.37	2.83	3.94
	(0.00)*	(0.04)*	(0.09)*	(0.05)*
Industrial countries	1.03	0.07	6.61	6.97
	(0.31)	(0.80)	(0.01)*	(0.00)*
All countries	36.87	21.05	14.94	15.02
	(0.00)*	(0.00)*	(0.00)*	(0.00)*
		Per Capita GDP Growth		
Large countries	15.11	9.87	2.08	20.74
	(0.00)*	(0.00)*	(0.15)	(0.00)*
Industrial countries	1.90	0.15	3.26	2.95
	(0.17)	(0.70)	(0.07)*	(0.09)
All countries	13.71	6.14	10.37	19.74
	(0.00)*	(0.01)*	(0.00)*	(0.00)*

Null Hypothesis: Data from treatment and control countries have been drawn from the same population.
* Significant at least at 10 percent.

the order of 40 percent. There are many possible reasons for these differences, including that the United States is a very large country, while the countries that have experienced reversals are much smaller. Also, the values of elasticities and other parameters may be different in the United States than in the average reversal country. Yet another possibility has to do with the level of economic activity and aggregate demand. Most recent models on the U.S. current account assume that the economy stays in a "full employment" path. It is possible, however, that the countries that historically have experienced reversals also have gone through economic slowdowns, and that a reduction in aggregate demand contributed to the adjustment effort.

Current account reversals, interest rates, and inflation

A number of analysts have argued that one of the most serious consequences of a rapid current account reversal (and the concomitant nominal depreciation) is its effect on inflationary pressures and inflation. In this section, I investigate this issue by analyzing the behavior of inflation and nominal (lending) interest rates in the period surrounding reversal episodes.[26] Chart 8 depicts data on (median) inflation rates for the three reversal samples; Chart 9, on the other hand, has data on nominal interest rates. As may be seen from Chart 8, in the "large countries" sample, there is a sharp increase in the (median) rate of inflation the year of the reversal. Although it stabilizes somewhat, inflation stays above its pre-reversal level for the three years after the current account adjustment. Chart 8 also shows that there is an increase in inflation after the reversals. In the industrial countries, however, the pattern is somewhat different from that of large countries; also, they exhibit some differences in behavior across the two definitions of reversals.

The data in Chart 9 on interest rates shows that in the three samples, and for both definitions of reversal, nominal interest rates are higher three years after the reversal than three years prior to the reversal. For the large countries, the increase is rather gradual. Interest rates begin to increase two years before the reversal. For reversal 2 percent, interest rates peak one year after the crisis; for the reversal 4

Chart 8
Evolution of Inflation Rate
(Median)

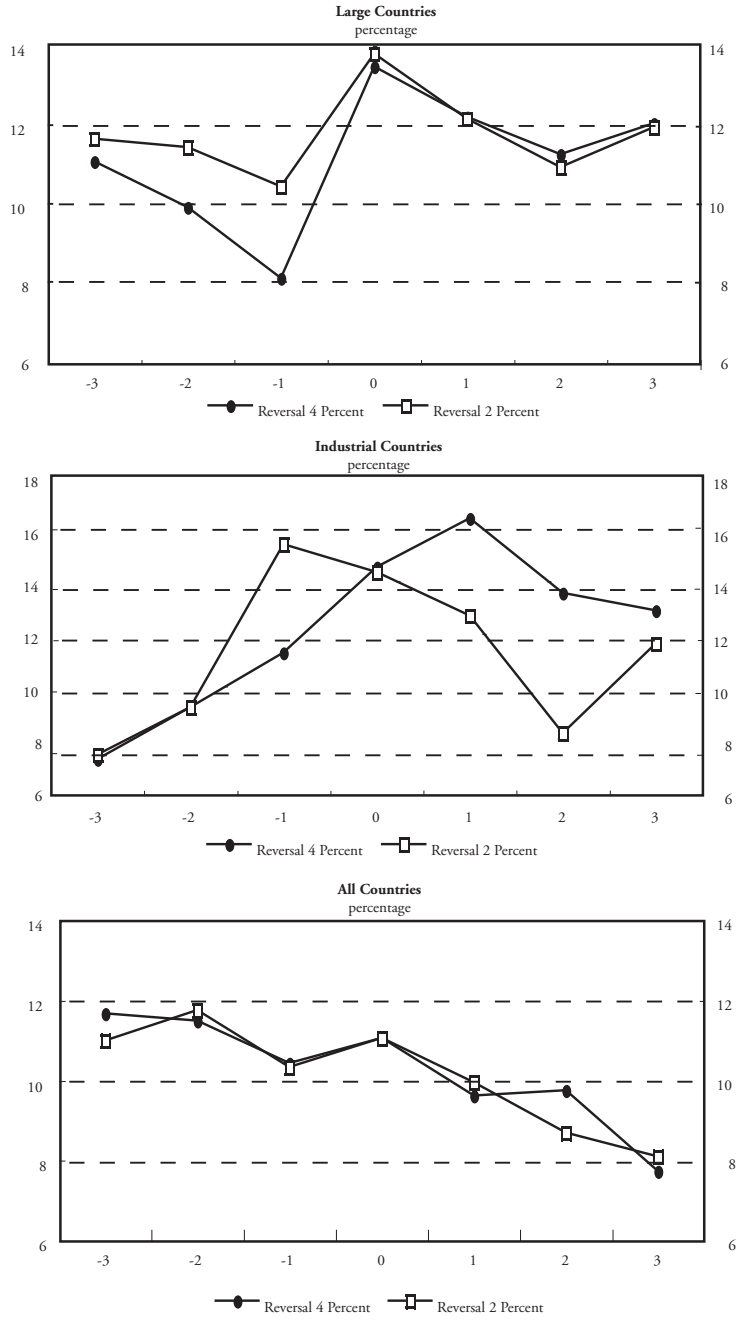
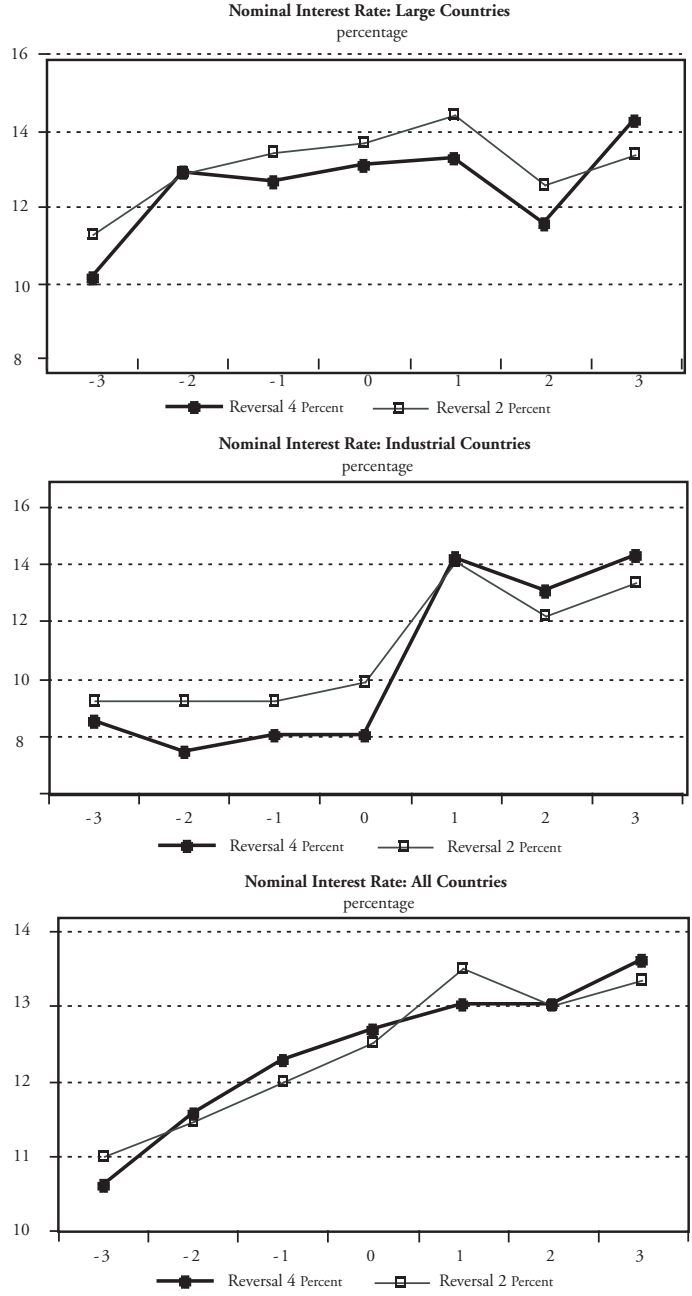


Chart 9
Evolution of Nominal Interest Rate
(Median)



percent definition, they peak three years after. In the industrial countries, on the other hand, there are no discernible changes in interest rates before the reversal; there is, however, a significant jump during the first year after the crisis. Finally, the data for all countries show a steady increase in nominal interest rates in the year surrounding the reversals. Between three years prior to a reversal 4 percent episode and one year after the reversal, median interest rates increased by 310 basis points in large countries, 570 basis points in industrial countries, and 240 basis points in all countries. Under most circumstances, increases in interest rates of this magnitude are likely to have a negative effect on aggregate demand and economic activity. In the fourth section of this paper, I deal with the effects of reversals on economic growth.

The Kruskal-Wallis tests in Table 10 indicate that, for the short-time horizon, changes in inflation are significantly higher in the reversal countries than in the control group. These tests also show that for large countries, changes in interest rates are significantly different in the reversal and control groups.

The probability of experiencing current account reversals

In order to understand further the forces behind current account reversals, I estimated a number of panel equations on the probability of experiencing a reversal. The empirical model is given by equations (1) and (2):

$$(1) \quad \rho_{tj} = \begin{cases} 1, \text{ if } \rho^*_{tj} > 0, \\ 0, \quad \text{otherwise.} \end{cases}$$

$$(2) \quad \rho^*_{tj} = \alpha\omega_{tj} + \varepsilon_{tj}.$$

Variable ρ_{tj} is a dummy variable that takes a value of one, if country j in period t experienced a current account reversal, and zero if the country did not experience a reversal. According to equation (2), whether the country experiences a current account reversal is assumed

to be the result of an unobserved latent variable. ρ^*_{tj}. ρ^*_{tj}, in turn, is assumed to depend linearly on vector ω_{tj}. The error term ε_{tj} is given by a variance component model: $\varepsilon_{tj} = \nu_j + \mu_{tj}$. ν_j is iid with zero mean and variance σ^2_v; μ_{tj} is normally distributed with zero mean and variance $\sigma^2_\mu = 1$. The data set used covers 87 countries for the 1970-2001 period; not every country has data for every year, however. See the Appendix for exact data definition and data sources.

In determining the specification of this probit model, I followed the literature on external crises, and I included the following covariates.[27] (a) The ratio of the current account deficit to GDP lagged one period. (b) A sudden stop dummy that takes the value of one if the country in question experienced a sudden stop in the previous year. (c) An index that measures the relative occurrence of sudden stops in the country's region (excluding the country itself) during that particular year. This variable captures the effect of "regional contagion." (d) The one-year lagged gross external debt over GDP ratio. Ideally, one would want to have the net debt; however, for most countries, there are no data on net liabilities. (e) The one-year lagged rate of growth of domestic credit. (f) The lagged ratio of the country's fiscal deficit relative to GDP. (g) The country's initial GDP per capita (in logs).

The results obtained from the estimation of this variance-component probit model for a sample of large countries are presented in Table 11; as before, I have defined "large" as having a GDP in the top 25 percent of its distribution. The results obtained are quite satisfactory; the vast majority of coefficients have the expected sign, and many of them are significant at conventional levels.[28] The results may be summarized as follows: Larger (lagged) current account deficits increase the probability of a reversal, as does a (lagged) sudden stop of capital inflows. Countries with higher GDP per capita have a lower probability of a reversal. The results do not provide strong support for the contagion hypothesis: The variable that measures the incidence of sudden stops in the county's region is significant in only one of the equations (its sign is always positive, however). There is also evidence that an increase in a country's (gross) external debt increases the prob-

Table 11

Current Account Reversals: Random Effects Probit Model—Unbalanced Panel Large Countries

Variable	(11.1)	(11.2)	(11.3)	(11.4)
	Reversal 4 Percent		Reversal 2 Percent	
Current account deficit to GDP	0.22	0.22	0.23	0.24
	(4.46)*	(4.51)*	(5.18)*	(5.20)*
Sudden stop	0.93	0.98	0.63	0.65
	(1.97)**	(2.09)**	(1.39)	(1.44)
Sudden stops in region	1.82	1.77	3.08	3.10
	(1.47)	(1.45)	(2.72)*	(2.77)*
External debt to GDP	0.01	0.01	0.01	0.01
	(1.16)	(1.19)	(1.22)	(1.30)
Domestic credit growth	-0.00	-0.00	-0.00	-0.00
	(0.10)	(0.15)	(0.13)	(0.14)
Fiscal deficit to GDP	-0.003	-	-0.007	-
	(0.64)	-	(0.21)	-
Initial GDP per capita	-0.10	-0.09	-0.03	-0.03
	(0.60)	(0.56)	(0.17)	(0.18)
Observations	555	595	555	595
countries	36	37	36	37

Absolute value of *z* statistics are reported in parentheses; explanatory variables are one-period lagged variable; country-specific dummies are included, but not reported.
* significant at 1 percent; ** significant at 5 percent; *** significant at 10 percent.

ability of reversals. Although the United States is a very special case, the results reported in Table 11 provide some support to the idea that during the last few years, the probability of the United States experiencing a reversal has increased.

Current account reversals and growth

One of the most important questions regarding a (possible) current account reversal in the United States is whether it will affect negatively economic activity and growth. In this section, I investigate the relation between current account reversals and real economic performance using the comparative data set presented above. I am particularly interested in analyzing the following issues: (a) historically, have current account adjustments had an effect on GDP growth, (b) have the effects of reversals depended on the structural characteristics of the

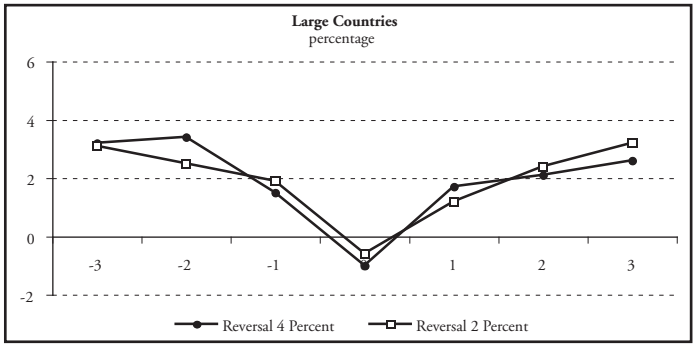
country in question, including its economic size (that is to say, whether it is a large country), its degree of trade openness, and the extent to which it restricts capital mobility, and (c) have the effects of the reversals on economic growth depended on the magnitude and speed at which the adjustment takes place? In addressing these issues, I emphasize the case of large countries; as a comparison, however, I do provide results for the complete sample of countries.

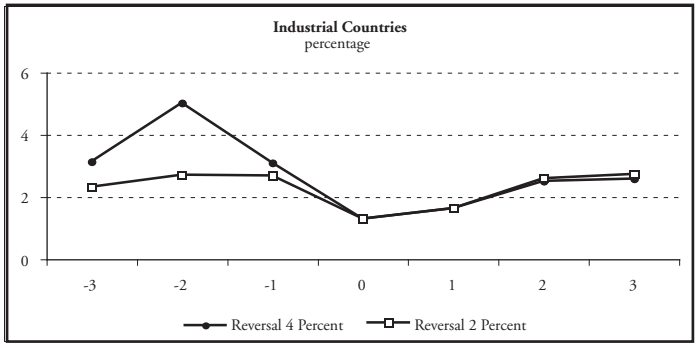
Authors who have analyzed the real effects of current account reversals have reached different conclusions. Milesi-Ferreti and Razin (2000), for example, used both *before-and-after* analyses as well as cross-country regressions to deal with this issue and concluded that "reversal events seem to entail substantial changes in macroeconomic performance between the period before and the period after the crisis but *are not systematically associated with a growth slowdown*" (p. 303, emphasis added). Edwards (2002), on the other hand, used dynamic panel regression analysis and concluded that major current account reversals had a negative effect on investment, and that they had "a negative effect on GDP per capita growth, even after controlling for investment" (p. 52).[29] Debelle and Galati (2005) used a before-and-after approach and concluded that (2 percent) reversals did not result in a slowdown in growth, a result that also was obtained by Croke and others (2005). Freund and Warnock (2005), on the other hand, used a multivariate statistical approach and found that reversals have been associated with a slowdown in economic growth. None of these studies, however, has analyzed the potential role of the speed of adjustment on the effects of reversals on growth.

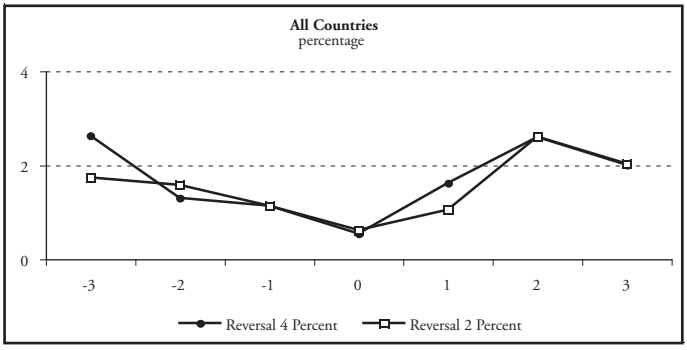
Preliminaries

In Chart 10, I present data on (median) GDP growth per capita in the period surrounding current account reversals. As may be seen in this chart, in the three samples considered in this study, there is a decline in GDP growth in the year of the reversal. This decline is particularly pronounced in the "large countries" and "industrial countries" samples. It is interesting to notice, however, that the drop in the rate of GDP growth appears to be short-lived. In the "large

Chart 10
Evolution of Per Capita GDP Growth
(Median)







countries" and "all countries" samples, there is a very sharp recovery in growth one year after the reversal episode. Kruskal-Wallis tests, reported in Table 10, indicate that in the reversal countries, growth is significantly lower in the years surrounding the reversals than in a control group of counties that have not experienced a reversal (the p-values range from 0.07 to 0.00).

Growth effects of current account reversals: An econometric model

The point of departure of the econometric analysis is a two-equation formulation for the *dynamics* of real GDP per capita growth of country j in period t. Equation (3) is the long-run GDP growth equation; equation (4), on the other hand, captures the growth dynamics process.

$$\tilde{g}_t = \alpha + x_j \beta + r_j \theta + \omega_j . \tag{3}$$

$$\Delta g_{jt} = \lambda[\tilde{g}_j - g_{jt-1}] + \varphi v_{jt} + \gamma u_{jt} + \varepsilon_{jt} . \tag{4}$$

$\tilde{g}_j$ is the long-run rate of real per capita GDP growth in country j; x_j is a vector of structural, institutional, and policy variables that determine long-run growth; r_j is a vector of regional dummies; α, β, and θ are parameters, and ω_j is an error term assumed to be heteroskedastic. In equation (3), g_{jt} is the rate of growth of per capita GDP in country j in period t. The terms v_{jt} and u_{jt} are shocks, assumed to have zero mean, finite variance and to be uncorrelated among them. More specifically, v_{jt} is assumed to be an external terms of trade shock, while u_{jt} captures other shocks, including *current account reversals.* ε_{jt} is an error term, which is assumed to have a variance component form, and λ, φ, and γ are parameters that determine the particular characteristics of the growth process. Equation (4) has the form of an equilibrium correction model and states that the actual rate of growth in period t will deviate from the long-run rate of growth because of the existence of three types of shocks: v_{tj}, u_{tj}, and ξ_{tj}. Over time, however, the actual rate of growth will tend to converge toward its long-run value, with the rate of convergence given by λ. Parameter φ, in equation (4), is expected to be positive, indicating that an improvement in the terms of trade will result in a (temporary) acceleration in the rate of growth, and that nega-

tive terms of trade shock are expected to have a negative effect on g_{jt}.[30] From the perspective of the current analysis, a key issue is whether *current account reversals* have a negative effect on growth; that is, whether coefficient γ is significantly negative. In the actual estimation of equation (4), I used dummy variables for reversals. An important question—and one that is addressed in detail in the subsection that follows—is whether the effects of different shocks on growth are different for countries with different structural characteristics, such as its degree of trade and capital account openness.[31]

Equations (3) and (4) were estimated using a two-step procedure. In the first step, I estimate the long-run growth equation (3) using a cross-country data set. These data are averages for 1970-2001, and the estimation makes a correction for heteroskedasticity. These first-stage estimates are then used to generate long-run predicted growth rates to replace $\tilde{g}_j$ in the equilibrium error correction model (4). In the second step, I estimated equation (4) using generalized least squares (GLS) for unbalanced panels; I used both random effects and fixed effects estimation procedures.[32] The data set used covers 157 countries, for the 1970-2001 period; not every country has data for every year, however. See the Appendix for exact data definition and data sources.

In estimating equation (3) for long-run per capita growth, I followed the standard literature on growth, as summarized by Barro and Sala-I-Martin (1995), Sachs and Warner (1995), and Dollar (1992), among others. I assume that the rate of growth of GDP ($\tilde{g}_j$) depends on a number of structural, policy, and social variables. More specifically, I include the following covariates: the log of initial GDP per capita; the investment ratio; the coverage of secondary education, as a proxy for human capital; an index of the degree of openness of the economy; the ratio of government consumption relative to GDP; and regional dummies. The results obtained from these first-step estimates are not reported because of space considerations.

In Table 12, I present the results from the second-step estimation of the growth dynamics equation (4), when random effects were used. The results are presented for two samples—"large countries" and "industrial countries"—and for the two definitions of reversals discussed above. The estimated coefficient of the growth gap is, as expected, positive, significant, and smaller than one. The point estimates are on the high side—between 0.69 and 0.78—suggesting that, on average, deviations between long-run and actual growth get eliminated rather quickly. For instance, according to equation (12.1), after three years, approximately 82 percent of a unitary shock to real GDP growth per capita will be eliminated. Also, as expected, the estimated coefficients of the terms of trade shock are always positive, and statistically significant, indicating that an improvement (deterioration) in the terms of trade results in an acceleration (de-acceleration) in the rate of growth of real per capita GDP.

As may be seen from Table 12, in all regressions, the coefficient of the current account reversals variable is *significantly negative*, indicating that reversals result in a deceleration of growth in both samples. For large countries, these results suggest that, on average, a reversal 4 percent reversal has resulted in a reduction of GDP growth of 5.25 percent in the first year. This effect persists through time, and is eliminated gradually as g converges toward $\bar{g}_j$. In the case of reversal 2 percent, the estimated negative effect is significantly at -4.3 percent. According to these results, the negative growth effects of a "front-loaded" current account reversal—that is, a reversal 4 percent episode—are significantly larger than those of a more gradual reversal or a reversal 2 percent type of episode. The results for the "industrial countries" sample are reported in equations 12.3 and 12.4 in Table 12. As may be seen, the negative effect on growth is milder than for large countries; it is still the case, however, that a front-loaded reversal has a more severe effect on growth than more gradual reversal episodes. When lagged values of the reversals indicators are added to these regressions, their coefficients turned out to be non-significant at conventional levels.

Table 12
Current Account Reversals and Growth
(Random Effects GLS Estimates)

	(12.1)	(12.2)	(12.3)	(12.4)
	Large Countries		*Industrial Countries*	
Growth gap	0.69	0.70	0.77	0.79
	(24.28)*	(24.33)*	(20.22)*	(20.50)*
Change in terms of trade	0.09	0.10	0.13	0.13
	(9.35)*	(9.60)*	(6.69)*	(6.66)*
Reversal 4 percent	-5.25	-	-3.80	-
	(9.11)*	-	(4.43)*	-
Reversal 2 percent	-	-4.34	-	-2.49
	-	(9.21)*	-	(4.45)*
Constant	-0.25	-0.21	-0.70	-0.70
	(1.99)**	(1.67)***	(4.22)*	(4.34)*
Observations	842	842	413	413
Countries	41	41	21	21
R-squared	0.45	0.46	0.53	0.53

Absolute value of *t* statistics are reported in parentheses; country-specific dummies are included, but not reported; *significant at 1 percent, **significant at 5 percent, *** significant at 10 percent.

To summarize, the results presented in Table 12 are revealing and provide some light on the costs of an eventual current account reversal in the United States. Historically, large countries and industrial countries that have gone through reversals have experienced deep GDP growth reductions; these reductions are higher if the current account reversal is front-loaded. These estimates indicate that, on average, with other factors given and depending on the sample and the definition of reversal, the decline of GDP growth per capita has been in the range of 2.2 percent to 5.3 percent in the first year of the adjustment. Three years after the initial adjustment, GDP growth will still be below its long-run trend.

Extensions, endogeneity, and robustness

In this subsection, I discuss some extensions and deal with robustness issues, including the potential endogeneity bias of the estimates. More specifically, I address the following issues: (a) the effects of terms of trade changes and (b) the role of countries' structural characteristics in determining the costs of adjustment.

Terms of trade effects

The results in Table 12 were obtained controlling for terms of trade changes. That is, the coefficient of the reversal 4 percent and reversal 2 percent coefficients capture the effect of a current account reversal, maintaining terms of trade constant. As discussed in the second section, however, in large countries, external adjustment is very likely to affect the terms of trade. The exact nature of that effect will depend on a number of factors, including the size of the relevant elasticities and the extent of home bias in consumption. In order to have an idea of the effect of current account reversals allowing for international price adjustments, I re-estimated equation (4) excluding the terms of trade variable for the "large countries" sample. The estimated coefficients for the reversals coefficients were smaller (in absolute terms) than those in Table 12, indicating that when the terms of trade are allowed to adjust, the growth effect of the reversal is less severe. That is, for large countries, the terms-of-trade adjustment following a reversal generates offsetting forces on growth. The estimated coefficient of the reversal 4 percent is now -4.1 (it is -5.3 in Table 12). The new estimated coefficient of reversal 2 percent is now -3.6 (it was -4.4 in Table 12). Interestingly, when the terms-of-trade variable is excluded from the regressions for the "industrial countries" and "all countries" samples, the coefficients of "reversal" are not affected.

Openness and the costs of adjustment

Recent studies on the economics of external adjustment have emphasized the role of trade openness. Edwards (2004), Calvo and others (2004), and Frankel and Cavallo (2004), among others, have found that countries that are more open to international trade tend to incur in a lower cost of adjustment. Most of these studies, however, have not made a distinction between large and small countries, nor have they distinguished between industrial and other countries. I added two interactive regressors to equations of the type of (4). More specifically, I included the following terms: (a) a variable that interacts the reversals indicator with trade openness and (b) a variable that

interacts the reversal indicator with an index of the degree of international capital mobility. Trade openness is proxied by the fitted value of the imports plus exports to GDP ratio obtained from a gravity model of bilateral trade.[33] The index on international capital mobility, on the other hand, was developed by Edwards (2005b), and ranges from zero to 100, with higher numbers denoting a higher degree of capital mobility. The results obtained are presented in Table 13. As may be seen, the coefficients of the reversal indicators continue to be significantly negative, as in the previous analysis. However, the variable that interacts trade openness and reversals is not significant for large and industrial countries, indicating that for these two groups, trade openness has not affected the way in which reversals affect growth. However, for the complete sample, this coefficient is significantly positive, indicating that countries that are more open to trade have a lower cost of reversals. The coefficient for the variable that interacts reversals with capital mobility is not significant for the "large" and "industrial" countries sample; it is significantly negative for the "all countries" sample (results available from the author). The results reported in Table 13, then, suggest that the way in which structural characteristics affect adjustment are different for different type of countries. While openness appears to be important for small non-industrial counties, they are not important for countries that are large or advanced.

Endogeneity

The results discussed above were obtained using a random effects GLS for unbalanced panels, and under the assumption that the reversal variable is exogenous. It is possible, however, that whether a reversal takes place is affected by growth performance, and, thus, is endogenously determined. In order to deal with this issue, I have re-estimated equation (4) using an instrumental variables GLS panel procedure. In the estimation, the following instruments were used: (a) the ratio of the current account deficit to GDP lagged one and two periods; (b) a lagged sudden-stop dummy that takes the value of one if the country in question has experienced a sudden stop in the

Table 13
Current Account Reversals, Trade Openness, Capital Mobility, and Growth
(Random Effects GLS Estimates)

	(13.1)	(13.2)	(13.3)	(13.4)
	Large Countries		*Industrial Countries*	
Growth gap	0.75	0.76	0.75	0.76
	(25.22)*	(25.48)*	(25.22)*	(25.48)*
Change in terms of trade	0.09	0.09	0.09	0.09
	(8.31)*	(8.48)*	(8.31)*	(8.48)*
Reversal 4%	-2.88	-	-2.88	-
	(1.86)***	-	(1.86)***	-
Reversal 4% * trade openness	-0.01		-0.01	
	(0.47)		(0.47)	
Reversal 4% * capital mobility	-0.05		-0.05	
	(1.57)		(1.57)	
Reversal 2%	-	-4.11	-	-4.11
	-	(3.20)*	-	(3.20)*
Reversal 2% * trade openness		-0.04		-0.04
		(1.31)		(1.31)
Reversal 2% * capital mobility		-0.01		-0.01
		(0.19)		(0.19)
Constant	-0.20	-0.14	-0.20	-0.14
	(1.62)	(1.16)	(1.62)	(1.16)
Observations	836	836	413	413
Countries	41	41	21	21
R-squared	0.45	0.45	0.53	0.53

Absolute value of *t* statistics are reported in parentheses; country-specific dummies are included, but not reported; *significant at 1 percent, **significant at 5 percent, *** significant at 10 percent.

previous year; (c) an index that measures the relative occurrence of sudden stops in the country's region (excluding the country itself) during that particular year—this variable captures the effect of "regional contagion"; (d) the one-year lagged external gross debt over GDP ratio; (e) the ratio of net international reserves to GDP, lagged one year; (f) the one-year lagged rate of growth of domestic credit; (g) the country's initial GDP per capita (in logs). The results obtained, not presented here because of space considerations, show that the coefficients of the reversal indicators are significantly negative, confirming that historically current account reversals have had a negative effect on growth. The absolute values of the estimated coefficients, however, are larger than those obtained when random effects GLS were used.

Alternative indicators of current account reversals

Throughout the analysis, I have used reversal indicators that constrain the current account deficit adjustment to be at least 5 percent of GDP in a three-year period. As a way of gaining additional insights into the effects of current account reversals, in Table 14, I present results obtained when two alternative reversal indicators are used: reversal 14 is defined as an episode where the current account deficit declines in at least 4 percent in one year, independently of what happens in the years to come. "reversal 12," on the other hand, is defined as an episode where the current account deficit declines in at least 2 percent in one year, independently of whether the deficit continues to decline in the following years. These two new variables, then, provide "less demanding" definitions of reversals. The results in Table 14 confirm those discussed above. They show that reversals have had a negative effect on growth in all three samples. In addition, these results indicate that the magnitude of the reversal matters; deeper reversals (4 percent in one year) have a more negative effect on growth than milder reversals (2 percent in one year). Also, a comparison between the results in Tables 12 and 14 suggest that the effects on growth of sustained reversals have a greater effect on growth.

Robustness and other extensions

In order to check for the robustness of the results, I also estimated several versions of equation (4) for the "large countries" sample. In one of these exercises, I introduced lagged values of the reversal indicators as additional regressors. The results obtained—available on request—show that lagged values of these indexes were not significant at conventional levels. I also varied the definition of "large countries;" the main message of the results, however, is not affected by the sample.

The U.S. current account reversal of 1987-1991

Between 1987 and 1991, the U.S. current account deficit experienced a major reversal. In the third quarter of 1987, the deficit stood at 3.7 percent, a figure that then was considered to be exceptionally high.

Table 14
Alternative Indicators of Current Account Reversals and Growth
(Random Effects GLS Estimates)

	(14.1)	(14.2)	(14.3)	(14.4)
	Large Countries		*Industrial Countries*	
Growth gap	0.72	0.72	0.78	0.79
	(25.33)*	(25.36)*	(20.72)*	(20.80)*
Change in terms of trade	0.10	0.11	0.12	0.14
	(10.30)*	(10.63)*	(6.64)*	(7.31)*
Reversal 14	-4.12	-	-3.58	-
	(9.34)*	-	(5.46)*	-
Reversal 12	-	-2.85	-	-1.70
	-	(9.08)*	-	(5.11)*
Constant	-0.21	-0.09	-0.65	-0.63
	(1.70)**	(0.67)	(4.02)*	(3.89)*
Observations	846	846	416	416
Countries	41	41	21	21
R-squared	0.47	0.46	0.54	0.54

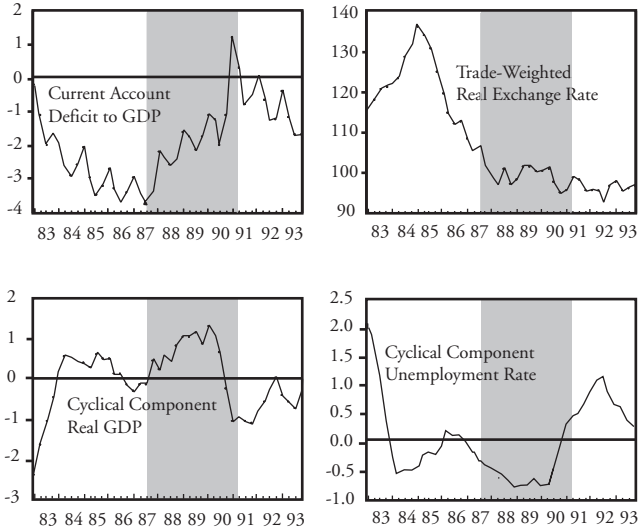
Absolute value of *t* statistics are reported in parentheses; country-specific dummies are included, but not reported; *significant at 1 percent, **significant at 5 percent, *** significant at 10 percent.

During the next three years, the deficit declined gradually, and in the fourth quarter of 1990, it was 1 percent of GDP. During the next two quarters, and as a result of foreign countries' contributions to financing of the Gulf War, the current account briefly posted a surplus of 0.8 percent of GDP. The 1987-1991 adjustment process was accompanied by a major depreciation of the U.S. dollar. The dollar began to lose value in the second quarter of 1985, almost two years before the current account deficit began its turnaround.[34] Although this episode does not qualify as a "reversal" in the empirical analysis presented in the preceding sections, it is the closest to a major current account adjustment that the United States has experienced in modern times. In this section, I analyze the behavior of some key economic variables in the period surrounding this adjustment.

In Chart 11, I present quarterly data for the period 1983-1993 for: (a) the current account balance; (b) the trade-weighted real exchange rate index for the U.S. dollar; (c) the cyclical component of real GDP; and (d) the cyclical component of the rate of unemployment.[35] In Chart 12, I present monthly data for the same period (1983-1993) for: (a) the rate of inflation; (b) the federal funds interest rate; and (c) the 10-year Treasury Note interest rate. In both charts, I have shaded

Chart 11

Macro Behavior in Period Surrounding U.S. Current Account Adjustment, 1987-1991



the period October 1987-June 1991, which corresponds to the actual period when the current account deficit declined. From an analytical point of view, however, we also are interested in the behavior of these key variables in the period immediately preceding and immediately following the adjustment. The picture that emerges from these charts may be summarized as follows:

- During the adjustment process, the U.S. dollar depreciated significantly in real terms. Between the second quarter of 1985 and the second quarter of 1991, the dollar lost 30 percent of its value in real trade-weighted terms. Between the third quarter of 1987 and the second quarter of 1991—the shaded period in Charts 11 and 12—the trade-weighted dollar lost 9.5 percent of its value.

- During the early part of the adjustment, there was no decline in GDP, nor was there an increase in unemployment. However,

during the latter part of the adjustment—starting in the second quarter of 1990—there was a decline in GDP and a marked increase in unemployment. Indeed, as may be seen from Chart 11, GDP stayed below its stochastic trend well into 1993; unemployment was above its own trend until early 1994. According to the National Bureau of Economic Research, in August of 1990, the United States entered into a recession that lasted until March of 1991.[36]

- During the first part of the adjustment, there was a sharp increase in the federal funds interest rate. In October 1986, the federal funds rate was 5.85 percent; by March 1989 it had increased by 400 basis points to 9.85 percent. In June 1989, the Fed cut rates by 25 basis points, and began a period of interest rate reduction. By the end of the adjustment, in June 1991, the federal funds rate stood at 5.9 percent.

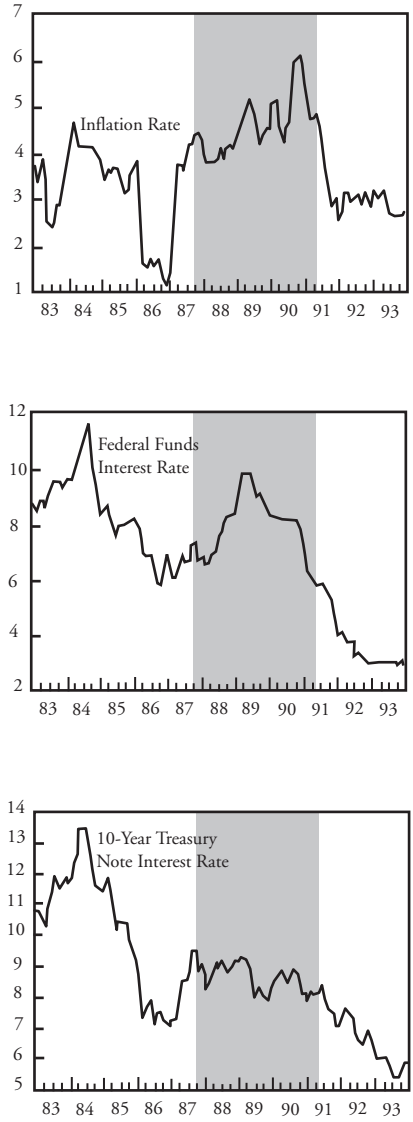
- The yield on the 10-year Treasury Note increased significantly in the months preceding the actual current account adjustment. The yield went from 7.1 percent in January 1987, to 9.4 percent in September of that year—an increase of 230 basis points. From that time and until March 1989, the yield on the 10-year Note moved between 9 percent and 9.4 percent. Starting in April 1989, long-term interest rates began to fall, reaching 8 percent in April 1991. In June 1993, two years after the current account adjustment had ended, the long-tem interest rate was 6 percent. The yield curve became inverted in January 1989 and stayed inverted until January 1990.

- In the period preceding the adjustment, there was an increase in inflation. This continued to exhibit an upward trend until late 1990, when it reached 6 percent.

Two other features of the 1987-1991 current account adjustment episode are worth noting. First, during that period, the U.S. terms of trade (prices of exports over imports) did not experience significant changes. And second, during this adjustment episode, the actual external adjustment took place through a decline in three categories of capital inflows: (a) foreigners' net purchases of private securities (bonds

Chart 12

Inflation and Interest Rates in Period Surrounding U.S. Current Account Adjustment, 1987-1991



and equities), (b) foreign central banks' net purchases of treasury securities, and (c) net bank credit. (See Chart 13 for the composition of current account financing for the period 1980-1993.)

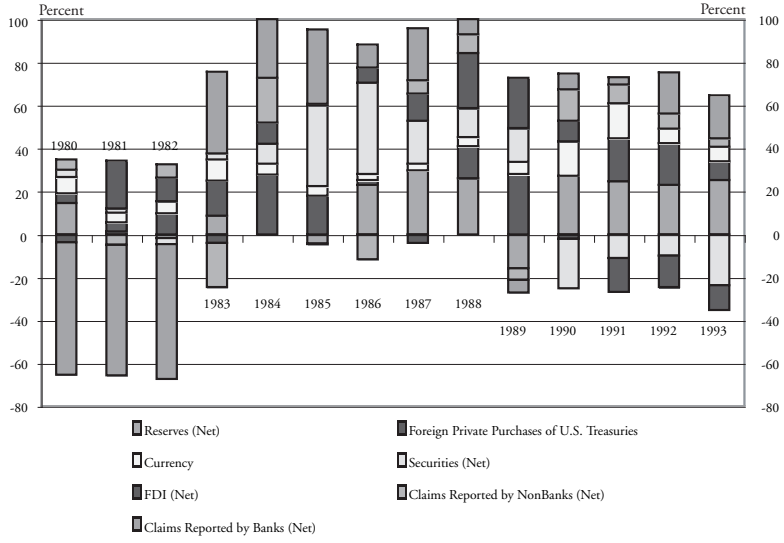
The 1987-1991 current account adjustment in the United States was significant, but gradual. And although the episode does not qualify as a "current account" reversal, as defined in the third section of this paper, it does provide some useful information. As Charts 11 and 12 show, this adjustment was not characterized by a traumatic collapse in output. However, its general pattern had many similarities with the major current account reversals analyzed in the third and fourth sections of this paper. The 1987-1991 adjustment episode in the United States was characterized by: (a) a steep depreciation of the U.S. dollar; (b) an increase in inflation; (c) higher interest rates—the fed funds rate increased through the first half of the adjustment, while the 10-year rate increased in the months prior to the beginning of the actual adjustment; (d) a decline in GDP below trend toward the latter part of the adjustment (in fact, the United States entered into a recession while the adjustment was taking place); and (e) an increase in the rate of unemployment above trend, during the final quarters of the adjustment.

Concluding remarks

In this paper, I have illustrated the uniqueness of the current U.S. external situation. As shown in the second section, never in the history of modern economics has a large industrial country run persistent current account deficits of the magnitude posted by the United States since 2000. This significant increase in the U.S. current account deficit may be explained by the increase in the international demand for U.S. securities during the last few years.[37] The future of the U.S. current account—and, thus, of the U.S. dollar—depends on whether foreign investors will continue to add U.S. assets to their investment portfolios. However, even under optimistic scenarios, the U.S. current account deficit will have to go through a significant reversal at some point in time.

Chart 13

U.S. Current Account Financing, 1980-1993



In order to have an idea of the possible consequences of this type of adjustment, I have analyzed the international evidence on current account reversals. The results from this empirical investigation indicate that major current account reversals have tended to result in large declines in GDP growth. Historically, large countries that have gone through major reversals have experienced deep GDP growth reductions. Three years after the initial adjustment, GDP growth still will be below its long-run trend. An analysis of the U.S. current account adjustment of 1987-1991 shows that this episode had many similarities with the major current account reversals discussed in this paper.

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Appendix

Description of Data

Variable	Definition	Source
Current account reversal 4 percent	Reduction in the current account deficit of at least 4 percent of GDP in one year and 5 percent accumulated in three years. Initial balance has to be a deficit.	Author's elaboration based on data of current account deficit (World Development Indicators).
Current account reversal 2 percent	Reduction in the current account deficit of at least 4 percent of GDP in one year and 5 percent accumulated in three years. Initial balance has to be a deficit.	Author's elaboration based on data of current account deficit (World Development Indicators).
Current account reversal 14	Reduction in the current account deficit of at least 4 percent of GDP in one year. Initial balance has to be a deficit.	Author's elaboration based on data of current account deficit (World Development Indicators).
Current account reversal 12	Reduction in the current account deficit of at least 2 percent of GDP in one year. Initial balance has to be a deficit.	Author's elaboration based on data of current account deficit (World Development Indicators).
Sudden stop	Reduction of net capital inflows of at least 5 percent of GDP in one year. The country in question must have received an inflow of capital larger to its region's third quartile during the previous two years prior to the sudden stop.	Author's elaboration based on data of current account deficit (World Development Indicators).
Nominal exchange rate	Local currency units per dollar.	International Financial Statistics, IMF.
Effective real exchange rate	Trade-weighted real exchange rate.	International Financial Statistics, IMF.
Terms of trade	Change in terms-of-trade exports as capacity to import (constant LCU).	World Development Indicators.
Reserves to GDP	Net international reserves over GDP.	World Development Indicators.
Domestic credit growth	Annual growth rate of domestic credit.	World Development Indicators.
External debt to GDP	Total external debt over GDP.	World Development Indicators.
Fiscal deficit to GDP	Overall budget to GDP.	World Development Indicators.
GDP per capita	GDP per capita in 1995 U.S. dollars.	World Development Indicators.
Index of capital mobility	Index: (low mobility) to 100 (high mobility).	Edwards (2005b).
Trade openness	Predicted trade from bilateral gravity equation.	Author's elaboration.

Endnotes

[1]Obstfeld and Rogoff (2004, 2005).

[2] See, for example, Barry Eichengreen's op-ed piece in the Dec. 21, 2004, issue of the *Financial Times*.

[3]Parts of this paper draw partially on my previous research on the current account and external adjustment. The results reported here, however, differ from previous analyses in several respects, including the data set, the definition of "reversal," the emphasis on large and industrial countries, and the statistical techniques used.

[4]See also Croke, Kamin, and Leduc (2005); Debelle and Galati (2005); Freund and Warnock (2005); Adalet and Eichengreen (2005); and Edwards (2004, 2005).

[5]In Edwards (2004), I used a smaller data set to investigate reversals in emerging countries. In Edwards (2005a), I included the case of industrial countries. However, I did not analyze whether the magnitude and speed of the reversal affected the nature of the associated costs.

[6]Parts of this section draw on Edwards (2005a).

[7]This is the Federal Reserve RER index.

[8]Mann (2004) shows that most of the U.S. trade deficit is explained by a deficit in automobiles and consumer goods.

[9]See, for example, Martin Wolf's Oct. 1, 2003, article in the *Financial Times*, "Funding America's Recovery is a Very Dangerous Game," p. 15.

[10]See Obstfeld and Rogoff (2004) and Mussa (2004).

[11]Stephen Roach from Morgan Stanley has been a forceful supporter of this view.

[12]That is, the global "savings glut" identified by Bernanke (2005) would have to be reversed. See also Chairman Greenspan's speech to the International Monetary Conference in Beijing, June 6, 2005.

[13]Notice that the thresholds for defining *high* deficits are year- and region-specific. That is, for every year there is a different threshold for each region.

[14]For an econometric analysis of current account deficits persistence, see Edwards (2004). See also Taylor (2002).

[15]For the United States, the data are from the Bureau of Economic Analysis. For the other countries, the data are, until 1997, from the Lane and Milessi-Ferreti (2001) data set. I have updated them using current account balance data. Notice

that the updated figures should be interpreted with a grain of salt, as I have not corrected them for valuation effects.

[16]This calculation assumes a 6 percent rate of growth of nominal GDP going forward.

[17]It should be noted that the study by Crocke and others (2005), as well as those by Debelle and Galalti (2005) and Freund and Warnok (2005), have used a rather mild definition of reversal, consisting of a reduction in the current account deficit of 2 percent of GDP in one year.

[18]In Edwards (2004), I used a smaller data set to investigate reversals in emerging countries. In that paper, however, I did not consider the experience of large or industrial countries with reversals. Also, in that paper, I used very simple framework for analyzing growth. In contrast, in this section, I use a two-step dynamic of growth approach.

[19]In both cases, the timing of the reversal is recorded as the year when the episode begins. Also, for a particular episode to classify as a current account deficit reversal, the initial balance has to be indeed a *deficit*.

[20]For recent papers, see Calvo and others (2004) and Frankel and Cavallo (2004). For capital flows and crises, see Eichengreen (2003).

[21]In order to check for the robustness of the results, I also used two alternative definitions of sudden stops, which considered a reduction in inflows of 3 percent and 7 percent of GDP in one year. Because of space considerations, however, I don't report detailed results using these definitions.

[22]For the relationship between depreciations and crises, see Eichengreen and others (1996).

[23]See Adalet and Eichengreen (2005).

[24]The tests are performed on the *changes* in the variables of interest during two time spans: between three years before and three years after the reversals, and between one year before and the year of the reversal. Three different control groups were constructed, one for each sample.

[25]These χ^2 tests refer to accumulated exchange rate changes in the years surrounding a reversal.

[26]Gagnon (2005) analyzes behavior of interest rates in the aftermath of currency crises. He does not concentrate on reversals, however.

[27]See, for example, Frankel and Rose (1996), Milesi-Ferreti and Razin (2000), and Edwards (2002).

[28]Results for the other two samples of countries are quite similar; they are not reported here because of space considerations.

[29]In a recent paper, Guidotti and others (2004) consider the role of openness in an analysis of imports and exports behavior in the aftermath of a reversal. See also Frankel and Cavallo (2004).

[30]See Edwards and Levy Yeyati (2004) for details.

[31]On capital account liberalization and growth, see Eichengreen and Leblang (2003).

[32]Because of space considerations, only the random effect results are reported.

[33]The use of gravity trade equations to generate instruments in panel estimation has been pioneered by Jeff Frankel. See, for example, Frankel and Cavallo (2004).

[34]This two-year lag coincides with the conventional wisdom of the time it takes a dollar depreciation to affect the current account.

[35]These cyclical components were computed using a Hodrick-Prescott filter on the complete time series from 1951 through 2005.

[36]I am not implying necessarily causality in this description of the data.

[37]This, in turn, is a manifestation of the "global savings glut."

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