5

Sustainability of the US Current Account Deficit and the Risk of Crisis

The large and growing US external deficit and the associated shift into net external debt pose potential problems for the US and world economies. The United States runs the risk that the external imbalance will eventually trigger a ''hard landing.'' For the rest of the world economy, a large ongoing US external deficit has mixed effects because although it provides a source of demand for exports, it also absorbs the lion's share of global capital flows (as will be examined in chapter 6). If there is a recessionary hard landing for the US economy, moreover, it is highly likely that the adverse effects will spill over to the rest of the world economy. Even if the United States were to escape any serious short-term disruption from an ever-widening external deficit, the long-term consequences would be to support additional consumption in the current decade at the expense of consumption in future decades, when the external debt would eventually have to be repaid, posing the same questions of intergenerational equity raised by the long-term fiscal problem.

This chapter examines the risks and sustainability of the US current account deficit and emerging net external debt from various vantage points. It first considers whether the US deficit has grown so large that the necessary foreign financing is likely to be difficult to mobilize because of constraints on the amount of US assets foreigners are prepared to hold relative to their overall portfolios. Trends in dollar reserve holdings by foreign central banks are an important part of this question. The discussion then turns to traditional benchmarks in terms of safe levels of external debt, and considers whether these thresholds—largely based on developing country experience—are of relevance to the United States. The chapter

concludes with a review of the evolving policy debate among economists on whether the external imbalance poses a potentially serious risk.

US Share in Global Portfolios

Potential risk to debtor countries can be viewed from both a stock and a flow perspective. Traditional rules of thumb tend to identify a range of about 40 percent of GDP as a zone in which the stock of external debt may begin to cause problems. As discussed in chapter 1, however, several industrial countries have exceeded this threshold without experiencing debt crises. More broadly, industrial countries have not defaulted on debt since the 1930s, and the safety thresholds have been based on the experiences of developing countries. For decades, Canada had net external debt in the range of 30 to 40 percent before its recent relative debt reduction; Australia and New Zealand have reached external debt ratios of 55 to 80 percent, respectively, over the past decade. More dramatically, Finland's net debt surged from 30 percent of GDP in 1988–93 to 70 percent in 1994–99 without causing capital markets to bat an eye (see figure 1.3 in chapter 1).[1] One likely reason is that capital markets have not viewed external net liabilities in equities as comparable to liabilities in pure debt (and surging prices of Finnish corporate stocks held by foreigners were the driving force in the sharp increase in net external liabilities).

US net external liabilities, at 22 percent of GDP at the end of 2004, are not yet at even the developing-country threshold of 40 percent, where debt stock might arguably pose a risk. As argued in chapter 2, moreover, in economic terms based on the burden of capital services payments, the United States has remained a small net creditor. In 2004, its ''economic'' net foreign asset position as measured by capitalized net capital income (CNCI) was still positive at 7.2 percent of GDP (chapters 2 and 3).

These considerations suggest that the United States remains well below levels of external indebtedness at which the stock of debt might begin to pose a serious risk to the economy. It seems considerably more likely, however, that the size of the annual current account deficit is so large that the United States could encounter external debt difficulties because of flow problems. The possibility of a flow crisis despite a comfortable stock situation is familiar among some developing countries with relatively low debt stocks that nonetheless experienced acute liquidity problems (a notable example being Korea at end-1997). The United States itself has experienced episodes of balance of payments flow crises when its net external asset position was considerably more favorable. The sharp decline

1. On the contrary, Finland's sovereign rating by Moody's rose from Aa2 in 1992 to the agency's highest level, Aaa, by 1998, and has stayed there since (Moody's Investors Service 2003, 16).

of the dollar in 1977–79 played at least a modest role in the severe tightening of US monetary policy in 1979–80, even though high inflation was the more prominent factor; and disagreement between US and German officials in mid-1987 about dollar policy at the height of the US current account imbalance likely contributed to the stock market crash of October 1987.

For the United States, the potential flow problem is not excessive short-term debt in the face of a fixed exchange rate, as was the case in Korea. Instead, the risk is that a change in expectations will make foreigners much less willing to finance the large current account deficit, placing pressure on the dollar and potentially forcing the Federal Reserve to boost interest rates to keep the currency from falling too rapidly, with recessionary consequences.[2] As examined below, already by 2002–03, there were signs of growing potential for such an event, as the composition of financing of the US current account deficit shifted substantially from private to official purchases of US assets. The largest official purchasers were China and, at least until March 2003, Japan, both intent on preventing appreciation of their currencies against the dollar.

Flow thresholds for external crises are not as familiar as debt stock thresholds. However, some recent studies have suggested that industrial countries have tended to enter into external difficulties and faced adjustment typically involving a slowdown in growth once their current account deficits reached 4 to 5 percent of GDP (Freund 2000, Mann 1999). The United States is already well beyond the 5 percent mark, and the baseline in chapter 3 shows the current account deficit rising to about 7½ percent of GDP by 2010.

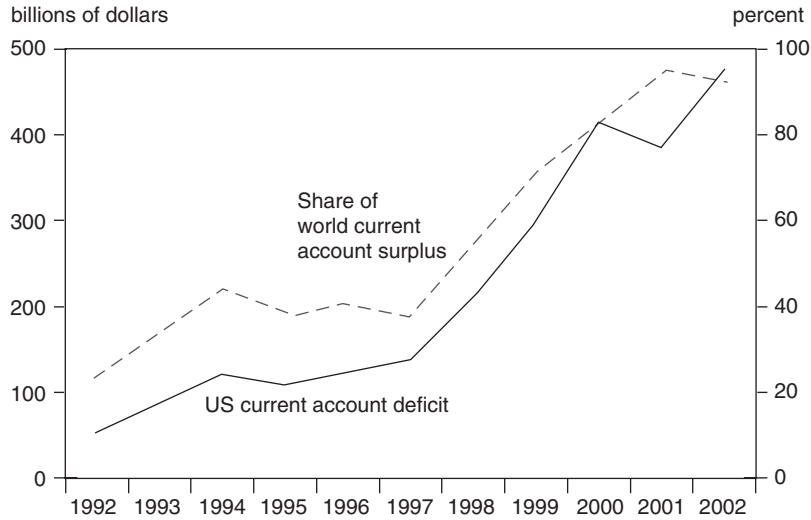
The constraint usually invoked in considering why the US current account deficit cannot keep widening indefinitely is the limit that foreign investors are likely to place on the share of US assets in their portfolios. It is in the portfolio share that the flow perspective intersects with the stock perspective. If there is a ceiling portfolio share, then the question is whether the existing stock places the present portfolio share close enough to that ceiling to pose a meaningful obstacle to continuation of the present pace of deficit flows.

Recent Trends

One gauge of the US portfolio share is simply the share of the US current account deficit in the global sum of current account surpluses for countries in surplus in the year in question. This current account share is essentially

2. It is unclear whether the Federal Reserve would have tightened just as much in 1979 because of inflation even if the dollar had not fallen. The dollar's fall presumably had some role in aggravating inflationary expectations. The reaction of the Federal Reserve to a dollar decline is discussed further below.

Figure 5.1 US current account deficit (left) **and share in world current account surpluses** (right), **1992–2002**



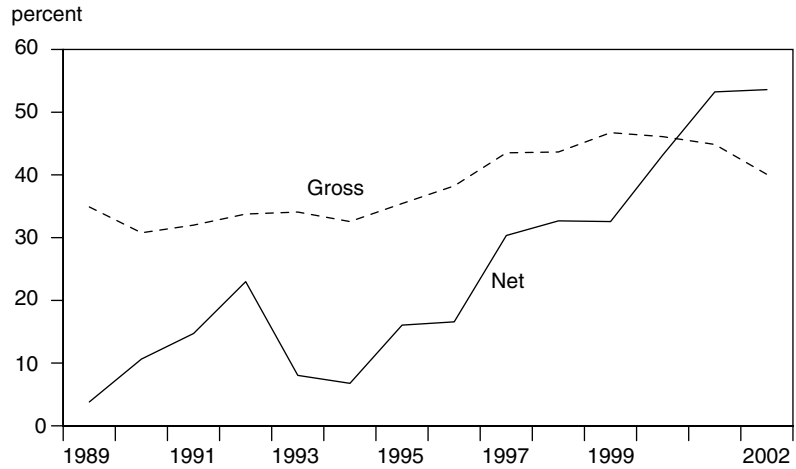
Note: Aggregate for all available surplus countries.

Source: IMF (2005b).

a ''marginal portfolio share,'' because the current account is the annual increment to the stock of the net international investment position (NIIP). Figure 5.1 shows the path of the US current account deficit (absolute value) in billions of dollars, on the left scale, and the US deficit as a percent of the total current account surpluses for surplus countries for each year in question (right scale) using data from the International Monetary Fund (IMF 2005b). As the figure shows, the US deficit rose from about 25 percent of the global surplus total in 1992 to a plateau of about 40 percent in the mid-1990s, before surging to an average of about 90 percent in 2000–02. The inordinate US share in global current account surpluses in recent years is a vivid illustration of the point that, because the US economy is so large relative to the economy of the rest of the world, there may be additional ''portfolio constraints'' limiting how long other countries are prepared to finance the ongoing US external deficits.

From the standpoint of shares in asset stocks as opposed to current account flows, the data compiled in chapter 1 provide a basis for examining the share of US assets in foreign portfolios. There are two alternative ways to gauge this share using these data. The first is to think of each country as a net debtor or net creditor, and to make the judgment that net debtor countries are competing for shares in an aggregate portfolio of net asset positions of the net creditor countries. If this ''net'' formulation

Figure 5.2 US liabilities relative to world external portfolios, 1989–2002 (percent)



Source: See appendix 1A.

is used, then the trend in the US external liability position would seem to give cause for concern about a rapid advance toward some plausible limit on the US share in foreign portfolios. Figure 1.9 in chapter 1 showed the time path of global net assets of net creditors and global net liabilities of net debtors. To address the global balance sheet discrepancy discussed in chapter 1, the more meaningful aggregate is that for global net liabilities of countries in net liability positions. This aggregate rose from $1.2 trillion in 1989 to $4.9 trillion in 2002. The stock of net US liabilities as a share of the global total rose sharply, from 4 percent in 1989 to 54 percent in 2002 (figure 5.2). (Note that the surprising fall in the portfolio share in 1993 reflected the large reduction in US net external liabilities that year as a consequence of enormous price valuation effects; see table 2.1 in chapter 2).

An alternative way to think about the US share in foreign external portfolios is in terms of gross external assets. In this framework, all foreign countries, not just net creditors, would be seen as potential holders of US external liabilities, and foreign holders would assess the US share against their gross holdings of foreign assets, not their net holdings. In this ''gross'' portfolio approach, also shown in figure 5.2, there is a far milder rise in the US share, and even some decline since 1999. By this measure, the US share rose from a low of 31 percent in 1990 to a peak of 47 percent in 1999 before easing to 40 percent in 2002. The gentler trend for gross external liabilities than for net liabilities simply reflects the much greater

proportionate rise for the net figure, which, as emphasized in chapter 1, is a residual between two large gross measures (assets and liabilities).[3]

Still another way to consider the US share in global portfolios is against total portfolios including domestic assets within foreign countries.[4] Data from the Organization for Economic Cooperation and Development (OECD) place gross household financial assets for the seven large industrial countries at $74 trillion at end-2001, or 3.6 times their combined GDP of $20.3 trillion (at market exchange rates).[5] At end-2002, gross financial assets of households stood at $35.7 trillion for the United States and an estimated $34.4 trillion for the other six major industrial nations that make up the Group of Seven (G-7): Japan, Germany, France, Italy, the United Kingdom, and Canada.

Considering total financial assets immediately helps place the external assets and liabilities into perspective. Gross US external assets and liabilities at end-2002 were 19.1 and 25.9 percent, respectively, of gross household financial assets, somewhat higher than the stylized fact of ''home bias'' in portfolios might suggest.[6] The main perspective provided by the total financial asset estimate is that net US foreign liabilities are small relative to total portfolios of US households. Thus, the end-2002 net external liabilities of $2.5 trillion amounted to only 7 percent of gross financial assets. Although they were relatively larger compared with net financial assets (about 11 percent), they were smaller relative to the net wealth of households, including housing and other nonfinancial assets (about 5 percent). Americans' net debt abroad is dwarfed by their net wealth at home.

Returning to the question of shares in foreign portfolios, figure 5.3 shows the path of gross household financial assets for the United States and for the other G-7 countries over the past decade, along with the trend in US gross external liabilities. It is evident that US gross external liabilities remain modest compared with the gross household financial assets of both the United States and the other G-7 countries. It is also evident,

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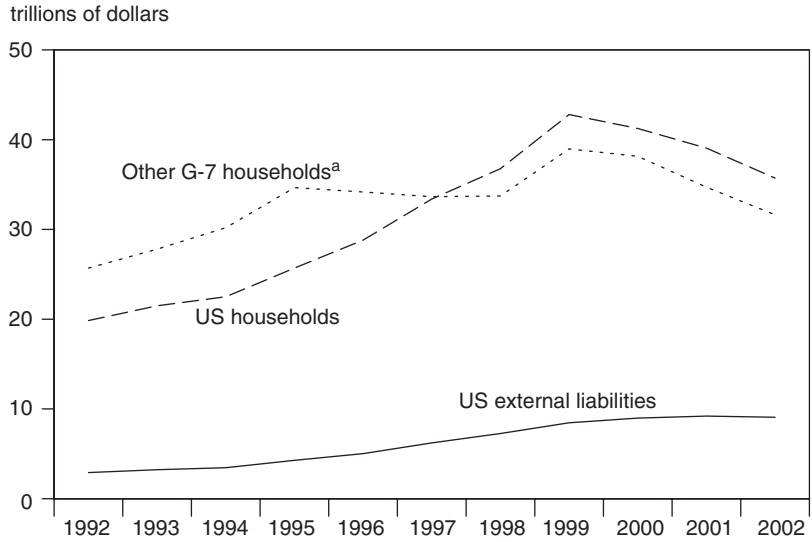
3. Note further that the seeming tension between the exceptionally high US share in resources provided by global current account surpluses in 2000–02, on the one hand, and the easing of the US gross liability share in the non-US global stock of gross external assets in those years, on the other, reflects the sizable contribution of exchange rate valuation changes in boosting the dollar value of the latter by 2002.

4. This section partly follows the data approach suggested in Mann (2003).

5. Calculated from OECD (2004a) for assets relative to disposable income and (2004d) for disposable income. End-2002 assets for Italy are based on end-2001 data and the percent change from 2001 to 2002 for Germany and France.

6. The ratio is not significantly biased upward by excluding the government, as US external reserves are small. Although the corporate sector is excluded, in principle, the value of corporate assets is already captured in the financial assets of households, because all corporate shares are owned ultimately by households.

Figure 5.3 Household gross financial assets and gross US external liabilities, 1992–2002 (trillions of dollars)



a. Does not include US households.

Sources: OECD (2004a, b); IMF (2004a, b).

however, that US gross external liabilities have risen substantially relative to both US and other G-7 nations' gross financial assets.

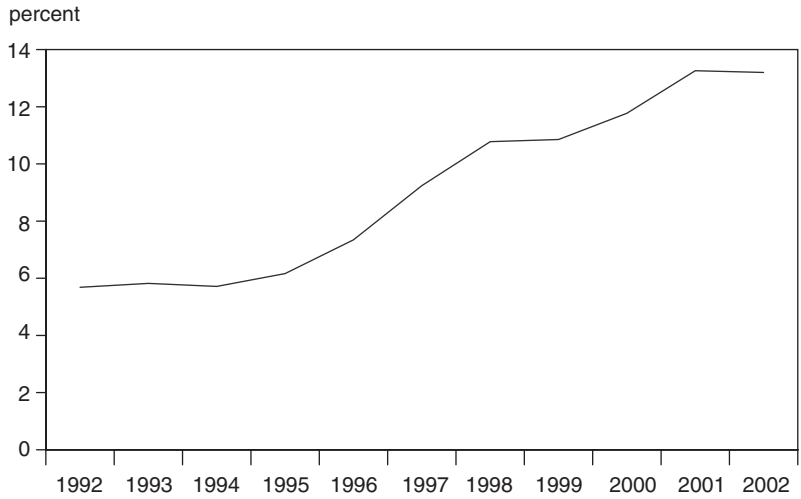
Another trend evident in figure 5.3 is the decline in household financial assets following their peak in 1999–2000. The decline was driven by a plunge in equity assets as a percent of disposable income from end-1999 to end-2002 (from 182 to 91 percent in the United States, 120 to 57 percent in the United Kingdom, 178 to 101 percent in France, and 153 to 102 percent in Italy).[7]

Still another important trend is the rise in US financial assets relative to those of the other main industrial countries. In 1992, gross household financial assets of the United States were only 77 percent as large as those of the other G-7 nations; by 2002, this ratio had reached 104 percent. Over the period, US gross financial assets rose 80 percent, whereas those of the other main industrial countries rose only 34 percent.[8] This means that the ratio of US financial assets to those in the other G-7 countries rose by

7. The latter figure for Italy is for end-2001. The bursting of the global equity bubble had much less impact in Japan (48 to 42 percent), Germany (75 to 54 percent), and Canada (an increase from 92 to 95 percent).

8. The slowest growth, but not by much, was in Japan (31 percent expansion versus 36 percent for the other G-7 countries, excluding the United States).

Figure 5.4 Share of US gross external liabilities in rest-of-world gross financial assets, 1992–2002 (percent)



Sources: See figure 5.3.

about 35 percent over the decade. It is perhaps less surprising than otherwise might be thought, then, that many US financial aggregates (including gross liabilities abroad) would have risen over the period relative to those of other industrial countries.

The more proper comparison for gauging the share of US assets in the portfolios of foreigners is against global rather than other G-7 nation assets. In the absence of data for other countries, such an estimate requires extrapolating from the other G-7 industrial-country aggregates to world portfolios. One basis for this expansion is GDP. In 2002, the other G-7 countries accounted for 51 percent of non-US global GDP at market prices (World Bank 2004a). An alternative benchmark is the global stock of capital. Cline (1997, 183) uses World Bank capital stock estimates to calculate that in 1993, the United States accounted for 20.8 percent of global capital stock, the European Union, 20.7 percent, Japan, 10.5 percent, and Canada, 2 percent. On this basis (and overstating the other G-7 nations a bit by treating the European Union as just the four largest European economies), the other G-7 nations accounted for 42 percent of non-US world capital stock. Considering that financial intermediation in the industrial countries is higher than in developing countries, this is also consistent with the other G-7 nations representing about half of non-US global financial assets. On this basis, a reasonable approximation of non-US global financial assets is simply twice the amount held by households in the other G-7 nations.

Figure 5.4 shows the results of comparing gross US external liabilities against the estimated total of financial assets for the rest of the world,

calculated simply as twice the amount for the other G-7 nations. This exercise shows the US share in foreign portfolios rising from 5.7 percent in 1992 to 13.2 percent in 2002. This rapid increase in share, coupled with continued (if lessening) home bias in portfolios, is suggestive of eventual limits in the pace of the US buildup of external liabilities, and perhaps sooner rather than later.

Baseline Projections

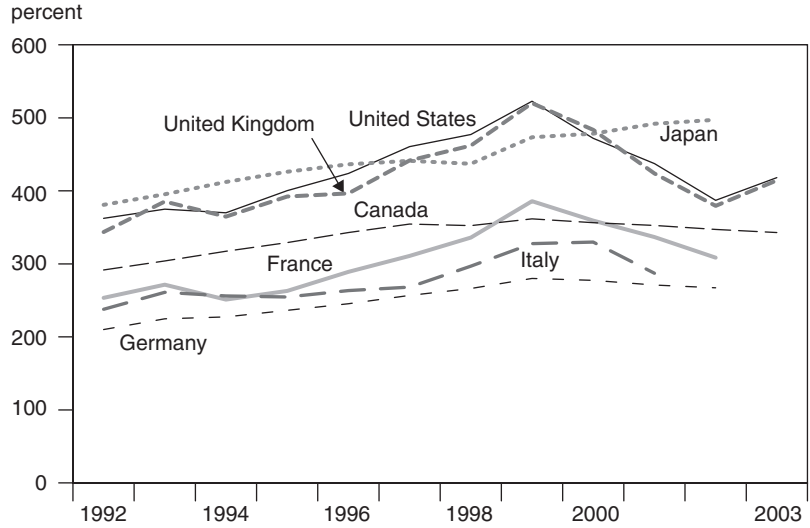
The baseline projections in chapter 3 for US external accounts provided corresponding projections of gross and net US external liabilities. For the average of the two models developed in chapter 3, with the dollar unchanged from its average real level in the first five months of 2005, and with baseline US and foreign growth, the US current account deficit would reach 7.7 percent of GDP in 2010. Gross US external liabilities would rise from $12.5 trillion at the end of 2004, or 107 percent of GDP, to $20.6 trillion at the end of 2010, or 128 percent of GDP. Net liabilities would rise correspondingly from 22 to 52 percent of GDP. This is on an accounting rather than an ''economic'' basis. It is the accounting gauge of financial liabilities that is more relevant for concerns about shares in foreign portfolios, whereas the economic concept of external liability burden (based on capital services rather than accounting net liabilities) is more relevant for diagnosing the underlying debt burden.

The size of foreign financial assets over the same horizon depends on the pace of foreign growth, the ratio of disposable income to GDP, and the trend in the ratio of financial assets to disposable income. Figure 5.5 shows that for the G-7 countries, there was a trend toward rising financial assets relative to disposable income during the past decade. For the G-7 excluding the United States, a simple linear regression (including country dummy variables) finds a highly significant annual increase in the assets/income ratio by about 8 percentage points per year over this period.[9]

As shown in figure 5.3, gross financial assets of households in G-7 nations excluding the United States reached an estimated average of $34.6 trillion in 2001–02. This represented a weighted average of 410 percent of household disposable income. A trend rise of 8 percentage points per year thus amounts to a 2 percent annual increase in the ratio of financial assets to disposable income for those G-7 nations. The projections of chapter 3 assume foreign real GDP growth of 3.5 percent per year and US inflation at 1.8 percent annually (GDP deflator). If the same inflation

9. The regression is: $z = 286.1\ (29) + 7.93\ T\ (8.1) + 109\ J\ (10) - 82.6\ G\ (-7.6) - 27.8\ F\ (-2.6) - 51.6\ I\ (-4.6) + 79.5\ U\ (7.5)$; adj. $R^2 = 0.90$, where z is gross financial assets as a percentage of disposable income, T is time (1992 = 1 to 2003 = 12), with t-statistics in parentheses. Dummy variables (1 if applicable, 0 otherwise) J, G, F, I, and U are for Japan, Germany, France, Italy, and United Kingdom.

Figure 5.5 Gross financial assets relative to disposable income, 1992–2003 (percent)

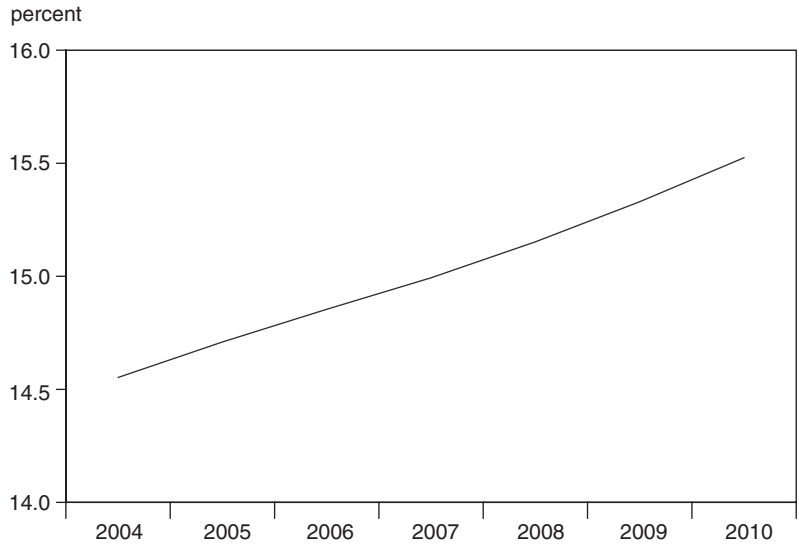


Source: OECD (2004a).

rate is applied to foreign economies, their nominal growth rate is 5.4 percent.

As a first approximation, then, the global non-US stock of gross financial assets begins from a 2001–02 base of about $70 trillion (twice the aggregate of the other G-7 countries) and grows at a nominal rate of 5.4 percent to accompany nominal GDP, plus 2 percent to capture financial deepening. A further adjustment of the base is needed to take account of the change in exchange rates from 2001–02 to 2004. From the end of 2002 to November 2004, the other G-7 currencies rose against the dollar by 18.8 percent, weighting by shares in gross household financial assets. This would have boosted the other G-7 nations' aggregate financial assets from $34.4 trillion to $41 trillion for exchange valuation. Adding 4 percent for two years' financial deepening and 9 percent for nominal GDP growth, the other G-7 nations' gross household financial assets in late 2004 stood at an estimated $46 trillion. Gross financial assets in the rest of the world will not have risen as fast in dollar terms because of much lesser appreciation of currencies against the dollar in this period. Omitting exchange rate movements for the non-G-7 nations, but incorporating annual financial deepening by 2 percent and GDP growth in dollar terms at 6.4 percent annually (4.5 percent real and 1.8 percent inflation), gross financial assets for this group would have risen from about $35 trillion to about $40 trillion from end-2002 to end-2004. So the end-2004 base for non-US global financial assets is an estimated $84 trillion. This aggregate can then be

Figure 5.6 Baseline projected share of US gross external liabilities in rest-of-world gross financial assets, 2004–10 (percent)



Source: Author's calculations.

projected to grow at 7.5 percent annually in the future, reflecting 2 percent annual financial deepening, 3.5 percent real GDP growth, and 1.8 percent inflation.

Figure 5.6 shows the resulting baseline projection for US gross external liabilities as a percentage of non-US global financial assets. This share in global portfolios is estimated at 14.6 percent for end-2004, about one-tenth higher than the 13.2 percent at end-2002. The rise in the dollar value of rest-of-world portfolios from depreciation of the dollar against the other G-7 currencies, combined with nominal GDP growth and some financial deepening, has substantially offset the brisk rise in gross external liabilities (from $9.3 trillion at end-2002 to $12.5 trillion at end-2004, a rise of 35 percent).

The baseline rise of US gross external liabilities, from 14.6 percent of rest-of-world gross financial assets to 15.5 percent over six years, is not dramatic, but it does pose the question of compatibility with the traditional ''home bias'' in financial portfolios. Feldstein and Horioka (1980) first identified this bias in statistical tests showing an extremely high correlation between national saving rates and investment rates; major divergences from investing in the home market would instead have generated lower correlation. Greenspan (2004a) has argued that the home bias has declined thanks to the growing integration of world capital markets. He notes that whereas the correlation between national saving and investment

was persistently about 0.95 for the postwar period up through the mid-1990s, by 2002, it had fallen to only 0.8. The share of foreign assets in the portfolios of US residents (including equity and debt securities as well as direct investment) rose from less than 9 percent in the 1970s to 15 percent in the mid-1990s.

Mann (2003) cites the estimate by Lewis (1999) that home bias preempts 70 percent of non-US world financial assets, making only 30 percent available for investment in the United States or other non-home countries. Mann (2003, 68) calculates that in 1998–2000, net foreign purchases of US assets represented 79 percent in the change in this ''available'' portion of foreign portfolios, climbing to 98 percent in 2001.[10] That pace would seem to indicate that the United States has already been testing the upper bounds of foreign portfolio availability to finance its external deficits. Nonetheless, if the 30 percent availability benchmark is used, then the baseline projections here placing gross US external liabilities by 2010 at about 16 percent of non-US gross financial assets (figure 5.6) would seem to leave significant room for increased foreign holdings of US assets.

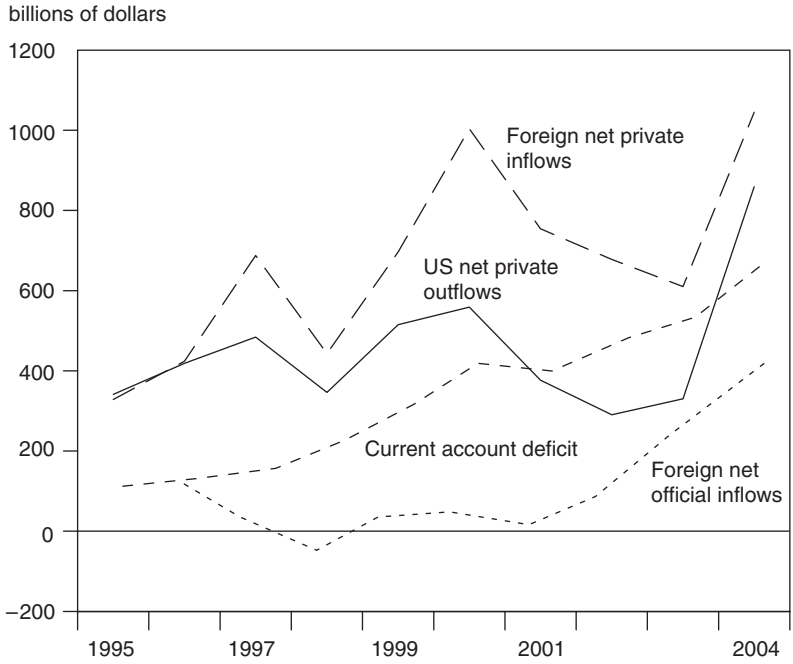
It is important, however, to keep in mind that for virtually all other countries in the world, the question of a global portfolio constraint would simply not arise. Other countries' external liabilities are simply too small to even raise the question of absorbing more than a ceiling amount that other countries in the aggregate are prepared to hold for the foreign portion of their portfolios. Yet there obviously have been ceilings on foreign willingness to hold more liabilities of individual countries in the past, not because of overall foreign portfolio limits, but because of expected return. In particular, when foreign creditors become concerned about solvency or even liquidity of the debt obligations, they will begin to run down their holdings or avoid accumulating more. So even if the United States could continue to find enough room in aggregate foreign portfolios to keep running large external deficits, it could find it infeasible to do so once foreign creditors become convinced that the rate of return on claims on the United States would be unattractive and quite possibly (or probably) negative in view of likely depreciation of the dollar.

Trends in Central Bank Portfolios

Even if foreign private holdings of US assets are not bumping up against ceilings of portfolio shares set by the home bias, foreign private investors

10. The corresponding absolute amounts averaged approximately $750 billion annually over 1999–2001. The higher percentage for 2001 reflects the economic slowdown and lesser expansion of non-US wealth.

Figure 5.7 US current account deficit and capital flows, 1995–2004 (billions of dollars)



Source: BEA (2005c).

will be unlikely to continue financing the US external deficit if they find prospective returns insufficient relative to risk and opportunities at home. As the US current account deficit has widened and the new-economy boom and stock market bubble have given way to recession and recovery, private foreign capital inflows have moderated and foreign government intervention has increasingly made up for the resulting potential gap in financing of the current account deficit. But this in turn has raised the question of whether foreign central banks have begun to reach limits in their exposure to the dollar.

Figure 5.7 shows annual capital flows and the US current account deficit for recent years, with 2000 marking the most extreme phase of large net private inflows. Private inflows that year reached about $1 trillion, exceeding private outflows by about $450 billion, or more than enough to cover the current account deficit of about $415 billion. Official capital inflows, which means foreign official buildup of their reserve holdings, were only about $40 billion. There then began a scissors movement that involved falling private inflows, somewhat offset by falling private outflows, in the face of a rising current account deficit. Although private inflows rebounded to the $1 trillion range in 2004, private outflows also

soared to some $860 billion, leaving a private capital surplus of only about $185 billion or only 28 percent of the current account deficit of $668 billion.

The growing gap between the current account deficit and net private capital flows during 2001–04 could have led to an even sharper decline in the dollar than occurred. Instead, such central banks as those of Japan, China, India, Korea, and many others intervened in increasing magnitudes.[11] Foreign official capital inflows ballooned to $114 billion in 2002, $278 billion in 2003, and $395 billion in 2004 (BEA 2005c). Financing by foreign central banks thus shifted from a cumulative average of 10.6 percent of the current account deficit during 1997–2001 to 24 percent in 2002, 54 percent in 2003, and 59 percent in 2004. If the central bank share is calculated against total gross capital inflows rather than the current account deficit, the corresponding shares reached 15 percent in 2002, 31 percent in 2003, and 27 percent in 2004.

The stock of foreign official holdings of US liabilities correspondingly rose rapidly, from $1.11 trillion at the end of 2001 to $1.98 trillion at the end of 2004 (BEA 2005e). The bulk of these holdings were in US government securities ($1.5 trillion at the end of 2004). By September 2004, foreign official and private holdings of US Treasury securities amounted to $1.85 trillion (US Treasury 2004a). This amounted to 43 percent of total US public debt held by the public (US Treasury 2004b).

The dollar experienced a phase of relatively rapid decline in the fourth quarter of 2004. From end-September to end-December 2004, against the dollar the euro rose 11 percent, the yen 6.6 percent, and the Canadian dollar 5 percent (IMF 2005a). In the face of prospective losses on reserve holdings in dollars, a number of central banks reportedly considered not only desisting from accumulating dollars but also shifting some of their dollar holdings to euros. Some authorities in Russia and China seemed to indicate that they were considering shifting reserves out of dollars, although subsequent denials typically followed.[12] The head of the European Central Bank (ECB) called the rise of the euro against the dollar ''brutal.''[13]

In contrast, in the first half of 2005, the dollar rebounded, especially against the euro in the face of French and Dutch referendums rejecting

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11. The Bank of Japan intervened massively from March 2002 to March 2004, boosting reserves from $394 billion to $816 billion, but largely desisted thereafter, placing reserves at $833 billion by May 2005 (IMF 2005a).

12. *Financial Times*, November 23, 2004; *New York Times*, December 4, 2004. Members of the Organization of Petroleum Exporting Countries (OPEC) reportedly had already cut back the share of their reserves in dollars from 75 percent in September 2001 to 62 percent by late 2004 to limit loss of reserve value as the dollar declined, and also in view of a shift away from pricing oil solely in dollars (*Financial Times*, ibid.). There were also signs of a shift out of US Treasury bonds into claims on the private sector (still in dollars), such as US mortgage-backed bonds held as part of China's reserves (*New York Times*, ibid.).

13. *The Economist*, November 16, 2004.

the new EU constitution. From end-December to June 30, the dollar rose 12.7 percent against the euro, 6.4 percent against the yen, and 2.1 percent against the Canadian dollar (Federal Reserve Board 2005d). Although the pressure was temporarily off the dollar, any major sell-off of dollar reserve holdings by central banks abroad in exchange for purchases of euros or other currencies would still contribute substantially to a renewed decline in the dollar. However, diversification out of the dollar would probably be mainly by central banks other than the ECB and the Bank of Japan. The ECB would have no practical alternative currency to diversify into, and by selling dollars, Japan's central bank would only risk driving the dollar down further, thereby increasing its accounting losses on reserves. Indeed, in late 2004, Japanese authorities were suggesting instead joint intervention with the ECB to purchase dollars (although the ECB showed no intention of doing so, at least in the absence of any approval by the United States of such joint intervention).

Roubini and Setser (2005) have argued that if foreign central banks were to quit accumulating more dollar reserves, there would be a major shock to US interest rates. Their ballpark estimate is a rise of 200 basis points. They emphasize that the entire new net supply of US Treasury obligations since 2000 has been purchased by nonresidents, with foreign central banks accounting for 80 to 90 percent of those purchases. They also stress that if foreign central banks stopped accumulating additional dollar reserves, the effect would be magnified by a cutback in foreign private capital inflows because private investors would begin to perceive more foreign exchange risk in purchasing US assets.

Truman (2005) has suggested that the interest rate impact of external financing is analogous to that of a fiscal deficit. Using this approach, and applying the Gale-Orszag (2004) rule of thumb that each 1 percent of GDP increase in the fiscal deficit boosts the long-term interest rate by about 30 basis points, if foreign central banks had not provided the $395 billion in net capital inflows (3.4 percent of GDP) to the United States that they did in 2004, then interest rates might have been about 100 basis points higher. It can also be argued, however, that there is a high degree of substitutability between private and official financing, and that a cutback of official financing would be offset by a rise in private financing in response to just a modest rise in the interest rate. Overall, it would seem likely that the impact of a cessation in foreign central bank financing of the US external deficit would boost long-term interest rates in the range of 50 to 100 basis points, rather than the 200 basis points suggested by Roubini and Setser.

Debt Ratios and Critical Thresholds

As there is an extensive literature on indicators of creditworthiness for developing countries, it is worth considering whether the benchmarks

from that literature might apply to the United States as a basis for identifying a possible future crisis, and if so, whether the United States is headed toward what have traditionally been regarded as danger zones for creditworthiness.

Crisis Indicators for Developing Countries

The traditional literature on developing country debt crises has focused on debt rescheduling or ''default'' events and examined the economic indicators associated with their occurrence (see Frank and Cline 1971; Cline 1984; Goldstein, Reinhart, and Kaminsky 2000; and Peter 2002). The formal econometric estimates typically apply binary-outcome techniques, such as logit analysis, and incorporate multiple variables (e.g., debt/export ratio, debt service ratio, reserves/imports, amortization rate, and in more recent studies, indicators of banking sector stability), rather than identifying single-variable thresholds. Nonetheless, various stylized-fact thresholds have emerged.

In the early 1970s, a popular benchmark was that debt service (interest on all debt plus amortization on long-term debt) should not exceed 25 percent of exports of goods and services. By the late 1970s, considerably higher debt service ratios were being maintained, largely thanks to an outward shift in the global supply of capital to developing countries associated with the recycling of petrodollars after the OPEC oil price increase of 1973–74. The debt crisis of the 1980s underscored the need for fiscal solvency (the internal transfer problem) as well as external solvency (availability of foreign exchange to service external debt), which increased attention to the debt burden relative to GDP. Stylized-fact critical thresholds for middle-income countries tended to be in the range of 40 percent for the external debt-to-GDP ratio and 300 percent for the debt–to-exports ratio.[14]

Cline (1995b, 50) emphasized that the debt burden depended crucially on the interest rate (which had soared in the early 1980s with the Volcker interest rate shock, discussed below), and suggested that the best measure was the ratio of net interest payments to exports of goods and services.[15] This ratio for 17 major countries involved in the 1980s debt crisis reached

14. Cline (1995b, 45) estimated that the GNP-weighted average ratio of net external debt (gross debt minus reserves) to exports of goods and services for the 17 countries included in the ''Baker Plan'' of concerted debt rollover rose from 290 percent in 1982 to 384 percent at its peak in 1986, and then declined to 225 percent by 1993, when most of these countries had regained access to capital markets. Cohen (1997) reported the average debt-export ratio for African and Latin American countries that experienced debt crises in the 1980s to be 270 percent.

15. That analysis omitted amortization on the grounds that in the 1980s debt reschedulings, principal on long-term debt was typically rolled over.

a GNP-weighted 30 percent in 1982, eased to 25 percent by 1984–88, and was down to only 11 percent by 1992–93, suggesting a critical threshold of perhaps 20 percent on this measure.

For the ratio of external debt to GDP, a 40 percent benchmark threshold has received recent statistical support from Reinhart, Rogoff, and Savastano (2003). They find that the median ratio of external debt to GNP for emerging-market economies that did not experience external default any time during 1970–2000 was 33 percent, whereas the median for countries that did experience default was 41 percent.[16]

The international effort in the late 1990s to reduce the debt of countries that qualified for relief under the Heavily Indebted Poor Countries (HIPC) initiative provided the occasion for policy reviews of debt thresholds considered sustainable. It was recognized that the debt of these countries had to be calculated in net present value terms to take account of ''illusory'' concessional debt at near-zero interest rates. The first incarnation of the HIPC initiative in 1996 set the range of 200 to 250 percent as the critical threshold for net present value of debt relative to exports of goods and services, and 280 percent as the critical threshold for the ratio of net present value of debt to fiscal revenue (van Trotsenberg and MacArthur 1999, 2). The second version of the initiative, the ''enhanced'' HIPC in 1999, lowered the debt-to-exports threshold to 150 percent ''to allow some leeway for debt burdens to increase in the future without pushing countries straight back into unsustainability'' (Birdsall and Williamson 2002, 32). The threshold for net present value of debt to fiscal revenue was similarly lowered to 250 percent. These thresholds, of course, were for poor countries, and thus presumably well below levels that could be considered sustainable for middle-income countries with greater access to capital markets.

The other experience of the late 1990s that generated new metrics for risk was the East Asian currency crisis. In particular, the crisis in Korea in late 1997 underscored the fact that even strong economies can get into an external sector crisis if they encounter a liquidity squeeze. The dominant indicator that came out of this experience was the ratio of short-term debt to reserves. Although there is no stylized-fact threshold for this measure, somewhere in the vicinity of 200 to 250 percent would seem consistent with the experience of the late 1990s. Thus, this ratio rose from 159 percent in 1991 to 955 percent in 1994 in Mexico's crisis; from 129 percent in 1994 to 177 percent in 1997 in Indonesia; from 206 percent to 315 percent over the same period in Korea; and from 80 percent in 1995 to 444 percent in 1998 in Russia (IIF 1999, 25).

16. The authors also conclude, however, that the safe level is far lower, perhaps as low as 15 percent of GDP, for those countries that have shown themselves to be ''debt intolerant'' by a record of serial defaults.

The prominence of banking sector problems in the East Asian crises also focused attention on financial indicators such as the ratio of M2 to base money and the real interest rate on deposits.[17] The shift of the nature of the crises from debt to currency collapse underscored the importance of such measures as the extent of mismatch in currency denomination of assets and liabilities (Goldstein and Turner 2004).

Are the Thresholds Relevant for the United States?

Those who are prepared to apply the traditional crisis threshold metrics for developing countries to the United States can find grounds for concern.[18] The accounting NIIP shows net liabilities at 221 percent of exports of goods and services for 2004 (see table 3.2 in chapter 3), three-fourths of the way toward a 300 percent critical ratio, and the NIIP stands at 22 percent of GDP, about halfway toward the 40 percent threshold. Nevertheless, there are several reasons why the conventional benchmarks for developing countries are unlikely to apply to the United States.

The first reason is that the debt ratios do not take account of the fact that the United States does not yet have a real debt burden, as it has still been earning more on its external assets than on its external liabilities. Thus, the economic net foreign asset measure (capitalized net capital income, or CNCI) suggested in chapter 2, which equals the net capital services flow discounted by the 10-year bond rate, was still modestly positive in 2004 (+7.2 percent of GDP). The United States does not yet have a debt problem if it does not yet have economically meaningful net debt.

My preferred indicator of the debt burden—the ratio of net interest to exports of goods and services—is highly relevant for the United States, because (when the concept includes equity earnings as well as interest) it accurately captures the fact that net US capital services are still slightly positive, indicating no debt burden at present. That does not mean, however, that the United States is not on its way to developing a sizable debt burden and eventually even a debt problem.

The central point about the debt-to-GDP ratio is not so much that it does not apply to the United States in principle, but that the debt must be carefully defined in economic terms to be meaningful. If a concept such as the CNCI suggested in this study is used as the debt measure,

17. See Goldstein, Reinhart, and Kaminsky (2000). Note, however, that these authors gauged each country's vulnerability against its own past averages rather than seeking to establish internationally applicable threshold levels.

18. Roubini and Setser (2004, 3) state, ''at an estimated 280 percent of exports at the end of 2004, [the] US debt to export ratio is in shooting range of troubled Latin economies like Brazil and Argentina.''

then the traditional benchmark of 40 percent of GDP would seem to be a reasonable criterion for defining a threshold where growing concern is warranted.

In contrast, the traditional debt ratios relative to the export base may not be relevant for the United States even when the economic as opposed to accounting net debt is used. The reason, as set forth more fully below, is that the United States is atypical in having its external debt largely denominated in its own currency, so the usual concern about the adequacy of foreign exchange availability from the export base is inapplicable.

The second reason that developing-country debt thresholds do not apply is that there is ample evidence that industrial countries such as the United States have less debt vulnerability. A central reason is that in the past, developing-country debt crises often arose because the government defaulted on its debt, whether owed to its domestic public or to foreign creditors. Yet industrial countries simply have not defaulted on public debt in the postwar era. Formal statistical tests by Reinhart, Rogoff, and Savastano (2003) find, in fact, that for advanced economies, the ratio of external debt to GNP is positively rather than negatively related to credit ratings by Institutional Investor over 1979–2000. In contrast, for developing countries, there is a strong negative relationship of these ratings to the debt-to-GNP ratio.

The third reason why many of the standard indicators are not applicable is that the United States borrows in its own currency rather than foreign currency. This means that the classic trigger for debt crises in developing countries—lack of foreign exchange to pay debt service coming due—is not relevant. The United States enjoys a status superior even to that of most other advanced economies in this regard. Indeed, the US situation is just the opposite of that of a developing country forced into devaluation. Typically, the developing country has a mismatch between external debt in foreign currency and domestic government receipts as well as private firm earnings in local currency. When there is a large depreciation of the currency, there is a severe balance sheet loss for both the government and the private sector. (Argentina is perhaps the most recent and most extreme example.) The local currency burden of the foreign-currency denominated debt soars with little rise in the local currency income base for servicing the debt (except for export-oriented firms, and for a moderate offset from induced domestic inflation).[19] In contrast, the balance sheets of US firms actually *improve* when the dollar declines, because foreign equity assets are denominated in foreign currency so their dollar value balloons, whereas liabilities to foreigners are in dollars and stay unchanged.

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19. Note that the inflationary relief appears to have fallen as well. In the 1980s, there was a high feedback from depreciation to domestic inflation, but in the past decade emerging-market economies have experienced remarkably low induced inflation in the face of sudden and large depreciations.

(The US government also experiences a windfall gain on the small amount of foreign exchange it holds in reserves.)

The irrelevance of some of the standard debt indicators when considering the United States with its own-currency debt denomination is most evident in the popular reserves/imports (or short-term debt/reserves) ratios. The United States has a reserve currency itself, and with no need for reserves, has a minimal amount of them. Gold and non-gold reserves stood at $85 billion at the end of 2003. This amounts to only about three weeks' worth of imports, which by international standards would be considered disastrously low. In contrast, in 2002, for other countries the median ratio of reserves to imports was 35 percent (about four months' imports), and the average was 54 percent (six months) (World Bank 2004a).

Sustainability Benchmarks for the United States

Analyses of sustainability of the US external imbalance usually focus on the size of the current account deficit relative to GDP. The framework for identifying the sustainable current account deficit, however, usually reflects an underlying judgment about the amount of net external liabilities the United States should prudently accumulate relative to GDP. With the target net liabilities relative to GDP in mind, the sustainable current account deficit is derived working backwards. The current account deficit is the change in the net liabilities position (aside from the equity price and exchange rate valuation influences examined in chapter 2).

Suppose that what is desired is to stabilize the ratio of net external liabilities to GDP at a target ratio "λ". If the nominal growth rate of GDP is g percent, it turns out that the sustainable current account deficit z, as a percent of GDP, consistent with this target is $z = \lambda g$.[20] This result excludes any valuation changes. The exchange rate valuation effects should be set to zero, because a sustainable current account deficit target should presumably be premised on a constant real exchange rate rather than requiring secular real depreciation. Although there are also price change valuation effects, these should be relatively small when the equity base is approximately the same size on the asset and liability sides.[21]

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20. Define D as "net foreign debt," broadly interpreted to include both credit instruments and equity liabilities. Let z be the ratio of the current account deficit to GDP. The condition for stability of a ratio is that at the margin this ratio equals the previous average of the ratio. So it is desired that $\Delta D/\Delta Y = D/Y = \lambda$, where Y is GDP and Δ indicates change. The change in nominal GDP is the nominal growth rate times the base level of GDP, or: $\Delta Y = gY$. The increase in net external debt is the current account deficit, or: $\Delta D = zY$. So we have: $\Delta D/\Delta Y = [zY]/[gY] = D/Y = \lambda$; $z = \lambda g$.

21. See the discussion in chapter 2 of the possible annual favorable valuation drift from equity price effects. Note that at the end of 2004, US direct and portfolio equity assets abroad were $5.8 trillion, while equity liabilities were $4.6 trillion, so each percentage point increase in equity prices adds about $8 billion to the US NIIP.

Williamson (2004, 30) and Mussa (2005, 189) arrive at a range of 2 to 2.5 percent of GDP as target current account deficits on this basis. Williamson suggests this would allow the NIIP to stabilize at ''a reasonable value''; Mussa explicitly arrives at the target based on a prudential limit of 50 percent of GDP for net liabilities relative to GDP, combined with an expectation of 5 percent nominal growth for US GDP (3 percent real plus 2 percent for inflation).[22]

The present study has emphasized the point that because of asymmetric returns on equity investment, the NIIP tends to overstate the net liability position of the United States in terms of economic burden. A reasonable modification of the sustainability criterion is thus to consider a target for the alternative concept of CNCI relative to GDP. At the same time, however, it would seem appropriate to set the ceiling for economic net foreign liabilities (CNCI) at perhaps 40 percent of GDP rather than 50 percent. The unique role of the US economy in the world economy, as well as the questionable if not perverse nature of sustained capital flows from developing countries to the United States instead of the reverse, is cause for prudence in setting an acceptable level of net US liabilities, even expressed as CNCI.

The preferred baseline projections of chapter 3 show the current account deficit at 7.3 percent of GDP by 2010, the accounting NIIP at −50 percent of GDP, and the CNCI at −22 percent. The favorable adjustment simulation in that chapter for a 21 percent real foreign appreciation against the dollar and a modest acceleration in foreign growth leaves the current account at a plateau of about −3 percent of GDP in 2008–10, the NIIP at about −30 percent (but still deteriorating slowly), and the CNCI net liability at only 7 percent (but still rising slowly). However, in that simulation much of the rise in both the NIIP and CNCI relative to the baseline stems from the exchange rate valuation gains from a large depreciation. In setting a sustainable current account, the expected real exchange rate should presumably be constant, and such gains would not be present.

The baseline nominal growth rate of the economy assumed in chapter 3 is 5.3 percent (3.5 percent real, 1.8 percent inflation). By the relationship $z = \lambda g$, if it is desired to limit the NIIP net liabilities to 50 percent of GDP, in the long term, the current account deficit would need to be limited to 2.65 percent of GDP. The paradox of a lower than 50 percent of GDP level of net NIIP liabilities by 2010 in the adjustment scenario (30 percent as just described), despite a higher current account deficit than 2.65 percent of GDP, stems from the fact that it takes a long time for a higher marginal ratio to bring up the average ratio to a 50 percent ceiling from a starting point about half that large in 2004.

22. Mussa (2005, 187) judges that ''a net liability ratio of 50 percent of GDP is still not a critical problem [for the United States]; but I would worry a great deal about ratios rising toward 100 percent of GDP.''

Overall, a reasonable long-term target for the US current account deficit would seem to be in the range of 3 percent of GDP. This is modestly higher than the 2.65 percent rate based on the expected nominal growth rate of 5.3 percent times a notional ceiling of 50 percent for the ratio of NIIP net liabilities to GDP. It is lower, however, than might be justified by judging sustainability by the alternative concept of economic burden of net liabilities as measured by CNCI/GDP. One reason to aim for a lower deficit is uncertainty that the size of the asymmetry between return on foreign equity assets and liabilities will remain as large as in the past. In particular, the substantially higher return on equity might not continue over a span of decades as opposed to a few years.[23]

The more fundamental reasons for a cautious current account target are that the United States should err on the side of prudence, both for its domestic economic welfare objectives and because of its central role in the global economy. Market behavior might not give full weight to persistent differential returns, leading to a confidence crisis despite continued long-term ''solvency'' as measured by either the NIIP or CNCI. In addition, the United States should at some point return to providing net capital to the rest of the world rather than borrowing on a net basis from it, especially from developing countries.

Hard Landing, Long-Term Burden, and Protectionist Pressures

International experience with the debt of middle-income countries has tended to identify crisis with disruption in payments, involving either temporary default or eventual forgiveness of a portion of the debt. For the various reasons just outlined, and especially on the basis of the still-valid assumption that the US government will not default on its public debt owed at home and abroad, many of the standard gauges of the severity of external debt would not seem to apply to the United States. However, this does not mean that the external sector is incapable of provoking a serious disruption in the US economy. In the short to medium term, the rising trade deficit and net foreign liabilities pose the risk of a ''hard landing'' for the dollar and the US economy (as well as the world economy). In the longer term, there are serious questions about the desirability of placing a large foreign debt burden on households in the next generation in return for increased consumption today. The outbreak of protection, moreover, has in the past been a forcing mechanism that has

23. As noted in chapter 2, if the difference in rates of return between assets and liabilities disappears, and if all rates of return equal the long-term bond rate, the CNCI becomes the same value as the NIIP.

mobilized corrective measures even when the financial markets might have allowed external deficits more latitude to continue growing.

Parsing the Hard-Landing Scenario

The principal means by which US external deficits and debt might pose an economic burden on the United States in the short to medium term is through a sharp reduction in foreign capital inflows in the face of a confidence shock. This could precipitate a severe, disorderly decline of the dollar and sharply higher interest rates. The interest rate shock, in turn, could provoke a decline in the equity and housing markets, curb investment and consumption, and precipitate a recession. This is the classic ''hard-landing scenario'' outlined by Marris (1985) in the previous round of severe dollar overvaluation in the mid-1980s. As noted below, Obstfeld and Rogoff (2004) have added an important nuance that is more modern. The extensive presence of derivatives in today's global economy suggests that an extremely large and sudden decline in the dollar could cause financial crises.

The simplest way to think about how a sharp decline in the dollar (hard landing for the dollar) might trigger a recession (hard landing for the economy) is probably the least relevant: a framework in which monetary authorities cared acutely about the value of the dollar and were prepared to defend it at all costs. In such a world, a plunge in the dollar would lead directly to a sharp hike in the policy interest rate (federal funds rate), and the higher interest rate would curb investment and consumption, provoking recession. Although there was some relevance of this framework under the Bretton Woods system of fixed exchange rates, it is much less germane today under flexible rates.[24] Today, central banks remain committed in principle to intervention to counter ''disorderly'' currency movements, implicitly defined as large movements in a short period of time. However, at no time was the recent decline of the dollar against the euro by 37 percent over 34 months (end-February 2002 to end-December 2004) considered sufficiently precipitous to trigger joint intervention.

A look back at Marris's hard-landing scenario in the mid-1980s indicates that even then the simple ''dollar defense'' dynamic was not the main concern. Instead, concern focused on supply and demand in the private capital markets. The fear was that if the dollar were to fall sharply, foreign suppliers of capital would seek to protect themselves from further exchange losses by cutting off new lending to the United States, creating a vicious downward spiral in the exchange rate and squeezing the supply of private capital, thereby boosting market interest rates.[25]

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24. Something very much like this happened, however, in the case of Argentina's crisis in 1999–2001, under its fixed peg of the peso to the dollar.

25. In Marris's words, ''The hard-landing scenario assumes that a 'crunch' in the financial and exchange markets is inevitable as people try to avoid the exchange rate losses involved

It is useful to consider the implications of a ''market interest rate shock'' unaccompanied by a change in the Federal Reserve's policy interest rate, which is the federal funds rate for interbank lending. The result would be a rise in the spread between the long-term interest rate, which the Federal Reserve does not control, and the short-term federal funds rate, which it does (and which moves virtually in lock-step with the short-term Treasury bill rate and the commercial paper rate).[26] But this would then involve a steepening of the ''yield curve,'' which is usually associated with a subsequent economic expansion rather than a recession.

Despite an unusual combination of steep yield curve with incipient recession, a surge in long-term market rates without a rise in the federal funds rate could occur. Indeed, as recently as the second quarter of 2004 the 10-year Treasury bond rate stood 360 basis points (3.6 percent) above the federal funds rate (IMF 2005a). If a yield curve this steep were imposed on a federal funds rate in the range of 4 to 5 percent (instead of 1 percent as in early 2004), the long-term market rate would be high enough to do considerable damage to the economy.

The interest rate shock would be greater and more certain, of course, if an initial rise in the long-bond rate were followed by a substantial increase in the federal funds policy rate. However, to prompt the Federal Reserve to boost the federal funds rate, a falling dollar would probably have to be seen by the Fed as heightening the risk of inflation by raising exports, curbing imports, and thereby pushing up output demand uncomfortably high relative to capacity. A second, more direct inflationary threat would also be perceived if monetary authorities expected dollar depreciation to translate directly into higher import prices. However, as discussed below, the emerging view that the import price pass-through has fallen would likely moderate this second potential channel of response by the Federal Reserve. Even if the Federal Reserve did increase policy interest rates due to such inflationary concerns, in the first instance, the impact would be to dampen overheating of the economy from excess demand. To get a hard landing, there would somehow have to be an overshooting in the extent of the interest rate increase and the size of the economy's reaction beyond the monetary authorities' expectations. Otherwise, the Federal Reserve's tightening would moderate excessive expansion rather than push the economy into recession.

Another way of looking at the hard landing is to ask whether currency depreciation in the face of the need to curb an external deficit is expansionary or contractionary for the domestic economy. In the classic literature on internal and external equilibrium (Meade 1951), a currency depreciation is

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in so sharp a decline of the dollar. . . . With inflation accelerating and the dollar falling sharply there would be little scope to ease monetary policy'' (Marris 1985, 138, 141).

26. Simple regressions on the federal funds rate (r_{ff}), expressed as percent rates, show the following results for quarterly data from 1982 to 2004 (from IMF 2005a). Treasury bill: $r_T = 0.244\ (4.6) + 0.961\ r_{ff}\ (119.7)$; adj. $R^2 = 0.994$. Commercial paper: $r_c = 0.239\ (4.0) + 0.880\ r_{ff}\ (97.6)$; adj. $R^2 = 0.991$. T-statistics are in parentheses.

expansionary because it stimulates a rise in exports, reduces supply from imports, and hence raises demand for domestic output. In some contexts, such as conditions that may be found in developing countries, depreciation on balance may be contractionary because of a delay in domestic output response (or inelastic demand for exports) in the face of a contractionary demand effect from the reduction in real incomes from higher import prices (Krugman and Taylor 1978). Recession could be aggravated where domestic firms suffer windfall losses because of large debt denominated in foreign currency, as happened in the East Asian financial crisis of 1997–98.

Under US conditions, in the first instance, the dominant influence of a dollar depreciation would likely be the classical expansionary effect, operating through the trade expansion channel. The principal question, then, is whether the contraction in total capital supply from a reduction in external financing would sufficiently raise long-term interest rates to curb investment and consumption by more than enough to offset the expansionary influence on net exports. A key related question would be whether the timing would be unfavorable, with immediate contractionary effects from higher interest rates but a longer lag for the boost in output in exports and import substitutes.

If the market impact were in the range of the increase of 50 to 100 basis points discussed above for a cessation of foreign central bank accumulation of dollar reserves, then in the absence of a conscious tightening by the Federal Reserve solely to ''defend the dollar,'' a contractionary effect for the economy would be unlikely.[27] However, a considerably larger increase in interest rates could occur if private inflows declined substantially as well. The overall effect could be substantial relative to the scale of the credit market. Total net borrowing in the US economy in early 2005 was running at an annual pace of about $3 trillion (Federal Reserve Board 2005c). Suppose that, including private lending, net lending from abroad fell by two-thirds of the amount of the current account deficit, or by $400 billion. This would amount to an ex ante cutback of 13 percent in total net financing in the US economy. This would seem large enough to require a substantial increase in interest rates to curb credit demand and call forth more credit supply.

The hard-landing scenario has probably been rendered at least temporarily less likely, moreover, by the partial reversal of the dollar's 2002–04 decline during the first half of 2005. This development has reminded markets that even with an outsized US current account deficit, the dollar's path is not a one-way bet. This in turn reduces the likelihood of ''extrapolative'' or ''bandwagon'' expectations in the currency market and increases

27. This would especially be the case if the Federal Reserve continued its recent view that the narrowing of the yield curve spread, offsetting tightening in the federal funds rate, was an unwelcome ''conundrum,'' and was thus content to see some widening in the spread as a consequence of the shrinkage in foreign capital supply.

the likelihood of ''stabilizing expectations,'' thereby reducing the chances that the dollar will sharply overshoot downward in its path toward an equilibrium level. Of course, if the resurgent dollar were to persist too long, the effect would be to aggravate the medium-term path of the current account deficit, setting the stage for a potentially more severe adjustment (harder rather than softer landing) in the future.

Overall, nonetheless, prudence suggests that policymakers should attach some significant probability to a hard-landing scenario in which a severe decline in the dollar triggers a recession. One reason is the potential for adverse effects in the stock market and the derivatives market. Another reason is the much larger external disequilibrium today than in previous historical experiences.

Even so, the appropriate policy framework would probably only place the probability of a hard landing for the economy from external imbalance in the range of 30 percent or so, albeit rising along with the current account deficit. This means that in the principal outlook, policy concern about the external deficit may not be dominated by the hard-landing risk. Instead, two other concerns may appropriately be more prominent. First, the external gap can impose a long-term burden on the economy and the next generation; and second, more immediately, the external deficit may provoke a political response of increased protection against imports. These risks are discussed in the next two sections.

First, however, it is useful to complete this consideration of the hard landing by recognizing that the United States has come close to such an outcome at least once and arguably twice in the past three decades. On the first episode, Marris (1985, 148–49) has summarized the events as follows.

> . . . [I]n 1978–79 . . . [there was] an initially expansionary fiscal policy, a deteriorating current account, and an inflation performance deteriorating relative to other countries. The first [anti-inflation program] . . . came in May 1978, including smaller pay increases for federal workers and . . . [a] reduction in planned tax cuts. Another package in October 1978 included a pledge to reduce the share of federal spending in GNP from 23 percent to 21 percent. . . . On November 1, 1978, a $30 billion line of foreign credits was mobilized to help support the dollar.[28]. . . . On October 5, 1979, the discount rate was raised—for the tenth time since January 1978—to 12 percent, and the Federal Reserve Board announced a major change in the conduct of monetary policy. . . . [N]one of this did much to stem the loss of confidence in the dollar, which fell by 35 percent against the DM [deutsche mark] in the four years to December 1979. . . . The shift to fiscal restraint, and more particularly the change in monetary policies, did, however, pave the way for the 1980–82 recession. . . .

It can be reasonably argued, however, that even this closest case for the hard landing was not really driven by the external imbalance and the falling dollar, but by the determination of the Federal Reserve Board

28. This would translate to $150 billion at today's size of the economy.

under then-chairman Paul Volcker to finally put a halt to the high inflation of the 1970s. Consumer prices had risen by an average of 12.5 percent annually in 1974–75 and 8.7 percent in 1976–79 before peaking at 12.3 percent in 1980 (IMF 2005a). The minutes of the Federal Open Market Committee for the crucial meeting of October 6, 1979, when the Federal Reserve shifted to targeting money supply rather than the interest rate, suggest that inflation was the primary concern and the dollar only a secondary concern.[29]

A second close flirtation with the hard landing arguably occurred in 1987. From end-October 1986 to end-January 1987, the dollar fell 10 percent against the deutsche mark (DM) and 6 percent against the yen, despite a hike in the federal funds rate by 60 basis points (IMF 2005a). US Treasury Secretary James Baker organized the Louvre Agreement of February, 1987, in which the United States and other G-7 members sought to assure that the corrective decline of the dollar previously agreed to in the Plaza Agreement of 1985 did not turn into an overshooting rout of the US currency. The Louvre Agreement sought to keep the dollar within certain ranges against the DM and the yen. Arguably, for some months the agreement successfully calmed the currency markets, as the dollar rose by about 2 percent against the DM from end-January to end-September. However, implementing the agreement meant either that the United States had to raise interest rates, or Germany and Japan needed to lower rates to support the dollar, posing problems of consistency of monetary policy with domestic goals. When German authorities instead raised interest rates following a US interest rate increase, the agreement broke down in an atmosphere of heated disagreement between US and German officials. The ensuing financial market uncertainty was a pivotal force contributing to the US stock market crash, which saw the Dow Jones Industrial Average fall by 23 percent in a single day (October 19, 1987) and about one-third from August to December (albeit from ''bubble'' heights following a run-up earlier in the year). US interest rates rose relatively sharply—from 7.25

29. In the opening briefing, the Federal Reserve staff expert did not even mention the status of the dollar. Chairman Volcker stated at one point, ''I don't think we are talking about a program here just to support the dollar. . . . The psychology in the foreign markets is the same as the psychology at home . . . it is the inflationary psychology. . . . So I don't think of this as a program specifically directed to the foreign side. If anything, it is specifically directed to the domestic side, but it will have foreign repercussions'' (Federal Reserve Board 2005e, 15). Henry Wallich, perhaps the most internationally oriented member of the Board of Governors at that time, stated, ''I think the main argument of the reserve strategy [the new policy of targeting money supply] is that it allows us to take stronger action than we probably could by the other technique. We are much more constrained in the other technique by the appearance of very high interest rates. . . . I think we need stronger action because of the resurgence in inflation and the behavior of the aggregates and the dollar'' (ibid, 19). He thus cited the dollar but only after enumerating inflation and money supply growth as grounds for action.

percent in February to 8.4 percent in June and 9.5 percent in October for 10-year Treasury bonds (IMF 2004b)—although the shock was not enough to precipitate a recession.

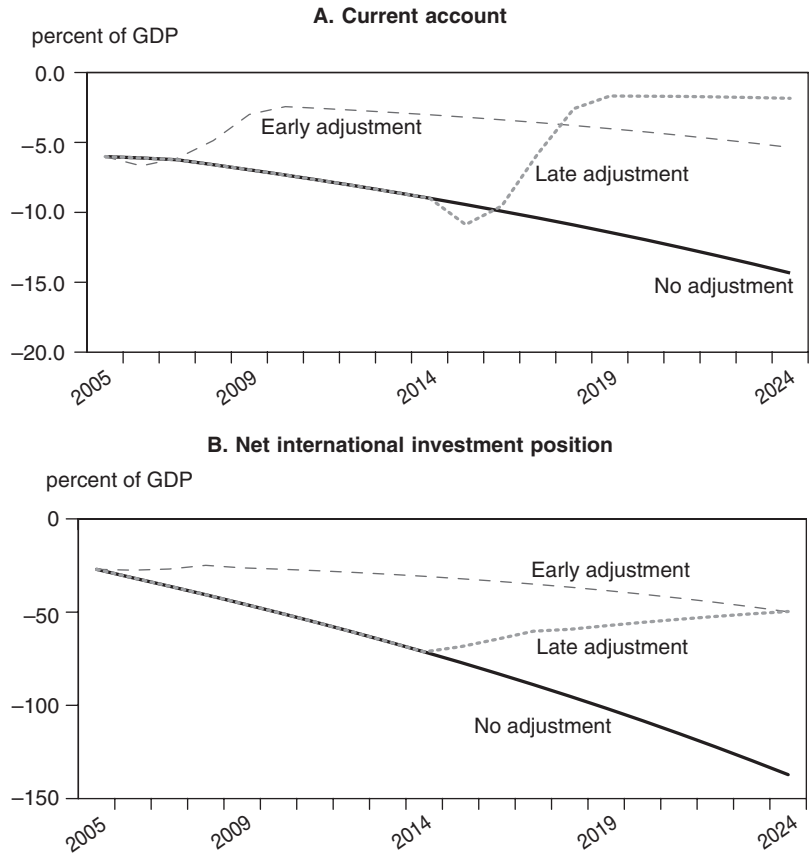
Long-Term Debt Burden Versus Short-Term Crisis Risk

In evaluating the potential risks of a large external deficit, it is important to recognize that even under favorable assumptions about the willingness of foreigners to finance an ever-widening deficit, there is the problem of what in the context of the domestic fiscal deficit used to be called the ''termites in the woodwork.'' The problem is not so much that there will be a sudden financial crisis as much as that, over a long period of time, the cumulative deficits will weaken the economy and, in particular, pose a large repayment burden for the next generation.

In the fiscal context, the problem of burdening the next generation is well understood (see Peterson 2004). In the external sector context, this potential problem is less widely recognized. It is often argued that it makes no difference to a typical future American household whether debt is owed to foreigners or to other (e.g., richer) Americans. But easy access to foreign financing and running a large current account deficit tend to facilitate consumption today at the expense of the future, when the external debt must be repaid. Moreover, there will be an adverse terms of trade effect of carrying out the external transfer to pay back the external debt in the future, as well as a reduction in future consumption needed to cut the external deficit.

It is possible to extrapolate the current account model of chapter 3 over a 20-year period to illustrate the issues involved in judging the long-term burden of delaying external adjustment. Figure 5.8 shows three alternative long-term paths for the US current account (panel A) and NIIP (panel B). The path with no adjustment shows the current account deficit reaching about 14 percent of GDP by 2024, and the NIIP reaching −135 percent of GDP. Neither level is credible, and some form of crisis would occur long before the end of the two decades. The path with early adjustment applies a foreign appreciation of 10 percent in 2006, another 10 percent in 2007, and a further 8.5 percent appreciation in 2008, for a cumulative foreign appreciation of 31 percent. This cuts the current account to a range of about 3 percent of GDP over 2009–15, although the deficit widens again to an average of about 4.5 percent of GDP by 2024. In early adjustment, the NIIP net liabilities are held to about 30 percent of GDP through 2015, but then gradually rise to 50 percent of GDP by 2024. In the path with late adjustment, in contrast, there is no real exchange rate adjustment until 2015, but then there is a sharp real foreign appreciation of 53 percent over three years. The late adjustment scenario follows the path of no adjustment until 2015, so the current account deficit reaches 11 percent of GDP and the NIIP reaches about −70 percent of GDP. Thereafter, the large foreign

Figure 5.8 Long-term current account and NIIP, 2005–24



Source: Author's calculations.

appreciation cuts the current account deficit sharply to about 1.7 percent of GDP by 2019–24. Nonetheless, the larger deficits in the first decade mean that the NIIP position by 2024 is the same as that under the early adjustment scenario, at −50 percent of GDP.

The larger required depreciation of the dollar in the late adjustment scenario means a greater terms of trade loss. With 50 percent import price pass-through, real import prices are about 10 percent higher in the second decade under late adjustment than under early adjustment. The cost of adjustment under the two alternative scenarios can be measured by the reduction in cumulative consumption associated with the cutback in the real trade deficit. It turns out that the cumulative adjustment cost is almost the same under the two scenarios.[30] The extra loss in terms of trade under

30. At 2005 prices, cumulative GDP during 2005–24 is $350 trillion. The sum of (unsustainable) baseline trade deficits (goods and nonfactor services) is $27.8 trillion. The corresponding

late adjustment is offset by earlier (but smaller) terms of trade loss in early adjustment, combined with the fact that there is a greater contribution of exchange valuation gains under late adjustment because of the greater depreciation and its application to a larger (because it is later) foreign equity stock.[31]

If some recessionary cost of adjustment is imposed on the late adjustment scenario, then the comparison could reverse to show early adjustment more favorable than late adjustment. The chances of a hard landing are much greater under late adjustment, considering that, whereas the current account narrows by 3.6 percent of GDP over five years under early adjustment, it must narrow by 7.3 percent of GDP over five years in late adjustment. This sharper reduction would be more likely to require recession to depress import demand. If it is assumed that a hard landing under late adjustment costs 4 percentage points of GDP (e.g., 2 percent in each of two years), then the cost of adjustment is greater under late than early adjustment, but the two scenarios still have nearly the same adjustment cost.[32]

The true cost of late adjustment, then, is not that it sharply increases total adjustment costs above early adjustment (although the specific assumptions for the comparison may understate the extra adjustment costs). Instead, the true cost of delayed adjustment is its inequitable distributional impact on the future versus the present. Under early adjustment, households cut consumption (reduce the real trade deficit) from the baseline by a cumulative $7.5 trillion (at 2005 prices), or 4.6 percent of GDP, in the first decade; and by a cumulative $16.4 trillion, or 8.8 percent of GDP, in the second decade. Under late adjustment, households do not cut consumption from the baseline at all in the first decade, but must cut consumption by a cumulative $23.4 trillion, or 12.5 percent of GDP, in the second decade. The cutback necessary in the second decade thus rises by 43 percent under late as compared with early adjustment. So the essence of the cost of delay is a distributional cost: the inequity of postponing the burden of external adjustment and placing it entirely on the ''next generation'' in the second decade.[33]

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sum of trade deficits with adjustment is $3.95 trillion under early adjustment and $4.38 trillion under late adjustment. The difference of $430 billion amounts to 0.12 percent of total period GDP.

31. Both scenarios cut the NIIP net liabilities from $45.8 trillion to $16.6 trillion in 2024. Exchange rate valuation effects directly contribute $2.1 trillion to this reduction in the early adjustment scenario, compared with $5.7 trillion in the late adjustment scenario.

32. Adding 4 percent of 2016 real GDP to the consumption loss under late adjustment boosts its total costs by $722 billion, causing the comparison between early and late adjustment to swing from −$430 billion to +$292 billion in favor of the early adjustment scenario. The latter amount would be only 0.08 percent of full-period GDP, however.

33. This analysis applies a zero discount rate, the framework usually applied in US policy discussions on long-term fiscal choices. Discounting at plausible rates would somewhat increase the marginal advantage of late over early adjustment but leave the unequal distribu-

Finally, it should be emphasized that the cost of delay in adjustment assumes all current account deficit resources are used for consumption. If somehow they could all be channeled to increase investment above levels otherwise attained, the calculus would shift more toward delaying adjustment because of additional future output from additional investment. However, the persistent decline in personal saving analyzed above suggests that, in contrast to the late 1990s, the United States has recently been in a persistent phase of using the resources from the external deficit to finance private consumption and government dissaving, rather than investment. No allowance for extra future output from persistent current account deficits thus seems the more prudent assumption.

The Risk of Protection

In past episodes of dollar overvaluation and US external imbalances, rising pressures have sometimes reached action-forcing levels first in the realm of trade protectionism rather than in the financial arena. Overvaluation and large trade deficits in the late 1960s and early 1970s ''coincided with the deepest protectionist pressures of the postwar period . . . despite modest levels of aggregate unemployment'' (Bergsten and Williamson 1983, 111). These pressures led to long-lasting protectionist measures, including the extension of textile and apparel quotas to synthetic fibers and import restraints in steel.

Similarly, in the mid-1980s, an overvalued dollar and large trade deficits spurred proposals for sweeping trade legislation to impose import surcharges on countries with large bilateral surpluses against the United States, quotas on footwear, ''reciprocity'' clauses mandating retaliation against countries whose markets were closed to US exports, and pervasive changes in trade law to facilitate petitions by US firms for relief from import competition (Destler 2005, 88–95). The threat of protection was a key factor prompting the second Reagan administration to switch from being unconcerned about the strong dollar and large deficit to making a conscious effort at dollar adjustment, led by Treasury Secretary James Baker and coordinated with other major economies through the Plaza Agreement in late 1985 on joint currency intervention to achieve appreciation of other principal currencies against the dollar.

Partly because of correction of the dollar and subsequent signs of trade adjustment, and partly because of chastening by the stock market crash of October 1987, negotiations between the administration and Congress on the omnibus trade bill began to take a more positive direction. The

tion of adjustment costs between the two decades essentially unchanged. Thus, if there is no recessionary disruption from the sharper, later adjustment in 2015 and beyond, discounting at 1 percent per annum boosts the advantage of late over early adjustment from 0.12 percent of full-period GDP to 0.7 percent.

eventual Omnibus Trade and Competitiveness Act of 1988 was far less protectionist than earlier drafts, and included the ''fast-track'' presidential negotiating authority needed for bilateral agreements as well as the Uruguay Round of multilateral trade negotiations. Nonetheless, the new law kept its Section 301 ''reciprocity'' directive to the US Trade Representative to seek retaliation against ''unjustifiable and unreasonable'' trade protection in other countries.

Today, there are signs that a large US trade deficit is once again exerting protectionist pressures. The principal target has been China, with the main issue proposed being retaliation for an undervalued Chinese currency, but there also have been calls for restrictions in textiles and apparel, furniture, and color television sets (Hufbauer and Wong 2004). Similarly, ratification of the Central American Free Trade Agreement (CAFTA), the Bush administration's top priority in trade legislation for 2005, faced serious difficulties in Congress, in part because of an overall environment of unprecedented trade deficits.[34] Even if the overall trade deficit is invoked as political cover for interest group politics (such as opposition to CAFTA from sugar growers), the consequence is to strengthen protectionist forces.

As discussed in chapter 6, the threat to impose trade penalties against China if it does not substantially revalue the renminbi may be salutary rather than pernicious, in view of the importance of this policy adjustment not only for the Chinese exchange rate but also for several other key Asian currencies. However, the risk of a stalling out of new free trade agreements, and more importantly, the Doha round of the World Trade Organization (WTO) negotiations, is a potentially high-cost ramification of the US trade imbalance. A key question is whether, as in the past, such protectionist risks will help focus the minds of top policymakers on the importance of taking corrective measures, ideally on macroeconomic policy and in the area of fiscal policy in particular.

The Evolving Crisis Debate

As the US current account deficit has continued to widen, and especially as the decline of the dollar after its peak in early 2002 gathered momentum in early 2004 and again in the fourth quarter of 2004, the debate has sharpened on whether the external imbalance poses a serious problem. In broad terms, from the late 1990s to late 2004, there was an increasing

34. As Senate Minority Leader Harry Reid (D-NV) put it: ''I don't like CAFTA; I am not going to vote for it, and I will do whatever I can to kill it. . . . We are approaching a trillion-dollar trade deficit. We can't survive as a viable, strong country doing that'' (''Free Trade Pact in Americas Faces Trouble,'' *New York Times*, May 10, 2005, C1). In late July 2005, CAFTA did finally pass the US House of Representatives, but only by a margin of two votes.

evolution away from the view that the strong dollar and external deficit were benign to the view that they pose a problem, despite some prominent contrary diagnoses by early 2005 (see the discussion of recent Federal Reserve studies and the global saving glut argument later in this chapter). The earlier benign diagnosis was premised mainly on the fact that the strong dollar was being driven by large private capital inflows and was going to finance a sharp increase in investment in the United States. US authorities typically averred that a ''strong dollar'' was good for the United States. As the sourcing of the inflows shifted from the private to the official sector, and the external resources shifted from financing high levels of US investment to high fiscal deficits and high personal consumption, the center of gravity in the debate shifted toward the diagnosis that the external imbalance posed a significant risk. This section reviews some of the principal arguments in this evolving debate.

Bellwether Policymakers

The evolution of the debate is perhaps best illustrated by the positions of two leading economic officials: Alan Greenspan and Lawrence Summers. In October 1999, Federal Reserve Chairman Greenspan (1999) stated that ''imports presumably can continue to expand for awhile, since the rising rate of return on U.S. assets has attracted private capital inflows, particularly a major acceleration of direct foreign investment. . . . But a continued widening of that deficit could eventually raise financing difficulties, ultimately limiting import growth.'' The current account deficit was 3.1 percent of GDP in 1999.

In 2002, the current account deficit reached 4.6 percent of GDP, and by March of that year Greenspan showed somewhat more concern:

> During the past six years, about 40 percent of the total increase in our capital stock in effect has been financed, on net, by saving from abroad. This situation is reflected in our ongoing current account deficit. . . . But this deficit is also a measure of the increase in the level of net claims, primarily debt claims, that foreigners have on our assets. As the stock of such claims grows, an ever-larger flow of interest payments must be provided to the foreign suppliers of this capital. Countries that have gone down this path invariably have run into trouble, and so would we. Eventually, the current account deficit will have to be restrained. (Greenspan 2002, 4)

After the current account deficit had reached 4.9 percent of GDP in 2003, Greenspan seemed to suggest in March 2004 that the imbalance could continue for a long time, because a declining ''home bias'' in international capital markets ''has enabled the United States to incur and finance a much larger current account deficit than would have been feasible in earlier decades'' (Greenspan 2004a, 5). He cited a Federal Reserve staff study indicating that in developed countries since 1980, current account

deficits had ''risen as high as double-digit percentages of GDP before markets enforced a reversal.'' He judged that ''the odds are favorable that current imbalances will be defused with little disruption to the economy or financial markets'' but acknowledged that ''there are other outcomes that are less benign'' and urged that ''one avenue by which to lessen the risk of a more difficult adjustment is for us to restore fiscal discipline.''

The current account deficit for 2004 reached 5.7 percent of GDP, and in November of that year, Greenspan signaled still greater concern:

> . . . [N]et claims against residents of the United States cannot continue to increase forever in international portfolios at their recent pace. Net debt service cost, though currently still modest, would eventually become burdensome. At some point, diversification considerations will slow and possibly limit the desire of investors to add dollar claims to their portfolios. Resistance to financing, however, is likely to emerge well before debt servicing becomes an issue . . . [as] a continued buildup of dollar assets increases concentration risk. This situation suggests that international investors will eventually adjust their accumulation of dollar assets or, alternatively, seek higher dollar returns to offset concentration risk, elevating the cost of financing of the U.S. current account deficit and rendering it increasingly less tenable. If a net importing country finds financing for its net deficit too expensive, that country will, of necessity, import less. (Greenspan 2004b, 2–3)

The evolution in the views of former US Treasury Secretary Lawrence Summers arguably has been even more pronounced. Summers was closely identified with a ''strong dollar policy.'' In January 2000, he stated:

> Any current account deficit is a reflection of. . .the amount invested domestically relative to the amount that is saved. When, as it does now in the US, the imbalance reflects a period of strong growth relative to the rest of the world, accelerating productivity gains and relatively high investment in our productive potential, and takes place in a context of rising public sector savings, it is unlikely to pose an immediate risk to the well being of the economy. Indeed, quite the reverse. (Summers 2000a, 1)

Summers (2000b, 1) also stated that ''. . . our policy with respect to the dollar remains unchanged: a strong dollar is in the interest of the United States.''

In contrast, by October 2004, the former secretary worried that ''the U.S. current account deficit . . . is perhaps receiving less attention than it should'' (Summers 2004). After noting that the size of the US current account deficit was ''without precedent'' and on track to rise even further, he asked: ''Is this current account deficit a sign of economic vitality or an incipient problem?'' His implied answer was that it was a problem because it reflected a decline in saving to ''the lowest net national savings rate in American history.'' He noted that ''net investment has declined over the last four or five years . . . suggesting that all of the deterioration of the current account deficit can be attributed to reduced savings and increased consumption rather than to increased investment.'' He added

that the investment that was taking place was not being channeled into tradable goods for future ''export capacity that can ultimately service debt'' but into nontraded goods as manifested by the ''dramatic increases in the price of residential real estate. . . .'' He indicated that the solution required both ''an increase in U.S. national savings'' as well as an appropriate adjustment in the ''relative price'' of US goods, including a ''coordinated adjustment of exchange rates that are quasi-fixed to the dollar'' (Summers 2004, 1, 3, and 7).

It should be stressed that the evolution in thinking about the current account deficit by both Chairman Greenspan and Secretary Summers reflects not only the widening of the deficit over time but perhaps more fundamentally, the transition of the US fiscal position from surplus to large deficit. So there are two basic reasons for their growing concerns. The first is normative: Policymakers can hardly be sanguine about a large current account deficit when the fiscal accounts show a large deficit, because the foreign resources are going to finance public overspending rather than private investment. The second is operational. In 1999–2000, those US policymakers who were concerned about the external deficit would have faced a quandary about what to do about it. The budget was already in sizable surplus. The most natural policy measure to curb the external deficit is to reduce the fiscal deficit or raise the fiscal surplus. Doing so not only cuts the investment-saving gap but also tends to reduce interest rates, in turn reducing the attractiveness of the home capital market to capital inflows, and thereby contributing to a decline in the exchange rate and an increase in the competitiveness of exports. But with the fiscal accounts already in sizable surplus, it would have strained policy credulity to call for an even larger fiscal surplus because of the potential future risks of the external deficit.

A New Bretton Woods ''System''?

In the emerging debate about the sustainability of large and growing US current account deficits, an intriguing argument has been advanced by Dooley, Folkerts-Landau, and Garber (2004). They maintain that today's international monetary system has in effect reestablished a sort of Bretton Woods system of fixed exchange rates for ''periphery'' countries' currencies against the dollar, and that this system coexists alongside a flexible exchange rate regime for the ''center'' industrial countries. The periphery includes most notably China and the rest of emerging Asia, but also Japan. The authorities in the periphery have struck an implicit bargain with the United States: They will intervene in the foreign exchange market to accumulate dollar reserves and keep their currencies at low valuations. In exchange, the United States will purchase their manufactured exports, which will enable the periphery countries to continue to absorb their

unlimited supplies of unskilled labor. Whereas the dollar may fall further against the euro and other flexible exchange rates at the center, the Bretton Woods-like fixity of the periphery exchange rate will guarantee that the US current account deficit will persist for years to come. Part of the motivation of the implicit bargain is that the monetary authorities of the periphery understand that they will eventually take large capital losses on their dollar reserves, but they are more concerned about assuring continuation of rapid export-oriented growth in the present than about future reserve value losses.

There are several serious problems with the revised Bretton Woods hypothesis (BW2 for short). First, Japan does not fit in the periphery. It has, if anything, a labor shortage (aging population) rather than an unlimited labor supply. Although Japanese authorities aggressively intervened to keep the yen from appreciating from April 2002 (right after the dollar's peak) to March 2004, they intervened very little in the year ending March 2005.[35]

Second, the numbers do not add up. The plausible periphery candidates do not have a large enough current account surplus to assure financing for the US current account deficit. The combined 2004 current account balances of China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand amounted to only $196 billion (IMF 2005b), or 29 percent of the US current account deficit for 2004. The BW2 periphery is simply too small by itself to finance the large US current account deficits. Even if Japan is added (with a current account surplus of $171 billion in 2004; ibid.), the total amounts to only about half of the US deficit.

Third, the BW2 hypothesis envisions a robust continuation of large US deficits and periphery surpluses over a decade or more, but there are already signs that protectionist pressures would cause a collapse in the arrangement much sooner. Legislation has already been proposed and widely supported in the US Senate to impose a 27 percent penalty tariff on China for manipulating its exchange rate to maintain undervaluation, given its continued exchange rate peg against the dollar despite a large current account surplus (4.2 percent of GDP in 2004; IMF 2005b). The BW2 authors count on the vested interests of US multinational firms as direct investors in China to assure lobbying pressure against any protectionist response by the United States, but this insurance looks increasingly unreliable. Moreover, although economists rightly argue that a country's exchange rate policies should be considered in light of its overall current account balance, not the bilateral trade balance, the large US bilateral deficit with China—$162 billion in 2004, or 70 percent of bilateral exports

35. Japan's foreign exchange reserves soared from $394 billion in March 2002 to $816 billion in March 2004, but changed little thereafter and stood at $827 billion in March 2005 (IMF 2005a).

plus imports (US International Trade Commission 2005)—exerts an inevitable political pressure towards a protectionist response.

In short, BW2 cannot be counted on to ensure comfortable financing of ever-larger US external deficits over a time span of a decade or more. The key kernel of truth in the hypothesis is its insight that many developing countries (and, on occasion, Japan) do pursue formal or informal exchange rate pegs against the dollar, and that this pattern amounts to returning a significant portion of the world economy to the Bretton Woods monetary regime with its associated problems. That regime of pegged exchange rates against the dollar imposed a straitjacket that kept the US currency from readily depreciating to contribute to external adjustment. Whereas other countries could devalue their currencies against the dollar, the United States could not achieve a generalized devaluation of the dollar against all other currencies by itself. Instead, it required a multicountry agreement reached at the Smithsonian Institution in December 1971 to revalue most currencies against the dollar. The implication is that if periphery countries de facto peg to the dollar today, some coordinated agreement for generalized realignments against the dollar may once again be needed.

Global Portfolio Optimists

Other international economists have argued more generally that there is ample room in foreign portfolios for further accumulation of claims against the United States and hence, continuation of a large and growing current account deficit. Mann (2004, 25) argues that there is a systematic ''co-dependency'' in which ''[t]o an inordinate degree, all countries and regions in the rest of the world have depended on net exports to the United States—both directly and indirectly—for economic growth.'' This imbalance, Mann maintains, is particularly apparent for Asia's net exports to the United States. On the US side, she judges that ''the U.S. structural tendency toward consumption and a savings-investment imbalance is reflected in a trending downward in household savings and a structural predilection toward imported consumer goods and autos'' (Mann 2004, 24). The resulting co-dependency of foreign countries on US demand and of US consumers on foreign saving has underpinned the persistent and growing US external deficit, but Mann judges that the path of the external deficit is unsustainable, and that correction is unlikely to be achieved by exchange rate adjustment alone. As a result, ''[t]here is a real possibility that the entanglements created by this co-dependency cannot be undone by anything short of a global economic crisis.'' So although for the relatively near term, Mann is by implication optimistic about further scope in foreign portfolios for financing US deficits, and even sees the system as structurally biased in this direction, her longer-term diagnosis is highly cautionary.

Cooper (2001; ''Two Views on the US Deficit,'' *Financial Times*, October 31, 2004) has been more squarely in the portfolio optimist camp. He emphasizes that rates of return on capital have been higher in the United States than in Europe and Japan, and more ''reliable'' (i.e., less risky) than in many developing countries. He also stresses the advantages of the US capital market for stocks and bonds in being larger, more liquid, and providing better protection to creditors and minority shareholders than most foreign countries. The United States also tends to be more attractive because its growth is typically higher than that in Europe and Japan and less volatile than that in emerging markets. When Cooper wrote in 2001, he added that investment had been strong and that unlike in the 1980s, foreign capital had been financing investment rather than budget deficits (although by now the 1980s pattern has returned).

Cooper argues, moreover, that the potential attraction of the US capital market for foreign investors will not be thwarted soon by problems of portfolio satiation. He uses back-of-the-envelope calculations to make the point. He illustrates the case of a $500 billion current account deficit continuing indefinitely. With nominal GDP growing at 5 percent (3 percent real plus 2 percent inflation), this constant deficit would cause the net international liabilities to rise from 25 percent of GDP in 2002 to a peak of 46 percent after 15 years, but thereafter, this liability ratio would persistently decline. The current account deficit would correspondingly fall to 2.2 percent of GDP by 2018, despite remaining constant in nominal dollar terms. Turning to the capital supply side, Cooper estimates that global saving outside the United States amounts to $6 trillion annually, so by comparison, his postulated $500 billion capital inflow into the United States, plus an allowance for financing needed to cover US capital outflows, amounts to only about 10 percent of global saving. With the US economy representing one-fourth of the world economy and one-half of world marketable financial assets, and given the favorable return-risk features of the US capital market, he finds it likely that foreigners will be comfortable placing 10 to 15 percent of their savings in the United States, especially as this share would decrease over time. He also emphasizes that any attempt to reduce the US current account deficit abruptly ''would undoubtedly produce a world recession'' (''Two Views on the US Deficit,'' *Financial Times*, October 31, 2004).

The real problem with Cooper's portfolio optimism is that it is not optimistic enough to cover the much wider US external deficits projected in the baseline of chapter 3, or the even wider future deficits predicted in such estimates as Roubini and Setser (2004) and Mann (2004). It is difficult to take strong exception to Cooper's view that the rest of the world could easily continue to finance a US current account path trending downward from 5 percent of GDP at the start to 2.2 percent 15 years from now. The problem is that the baseline is now starting at 5.7 percent of

GDP and is headed for about 7½ percent of GDP in just five years and 12 percent in 15 years (see figure 5.8). Cooper does not clarify what forces or policy changes will turn around the baseline from an ever-widening gap relative to GDP to a gradually falling share of GDP.

Substitutability Pessimists

Obstfeld and Rogoff (2004) have provided one of the more influential and rigorous recent studies on the pessimistic side of the debate over whether the United States faces a potential external sector crisis. Their approach is in the Chicago tradition that emphasizes the relative price of tradables versus nontradables. This approach differs from both the workhorse ''elasticities'' model and the national accounts-oriented ''absorption'' approach (see chapter 4), although its results are influenced by price elasticities and by the extent of the reduction in domestic absorption of tradables needed for adjustment.

The central conclusion of Obstfeld and Rogoff is that any event or process that forces the elimination of the US current account deficit will as a consequence significantly reduce the real exchange rate of the dollar. They cite a range of 20 percent if the adjustment is gradual and 40 percent if it is abrupt and involves overshooting. The essence of their model is that the trade deficit is large relative to the tradable goods sector, and that the substitutability in demand between tradables and nontradables is limited, so that it will take a large rise in the relative price of tradables to curb demand enough to close the external gap. By symmetry, the rest of the world needs to have a decline in the price of tradables relative to nontradables. The increase in the real price of foreign exchange can thus be even greater than the increase in the relative price of tradables to nontradables domestically. The exchange rate adjusts as a consequence of the trade adjustment, not as a cause. The cause is some demand shock that reduces the relative price of nontradables, such as a collapse in the housing market.

Obstfeld and Rogoff do not see forced external adjustment as injurious to real activity in a direct sense, and they see the extent of US net international liabilities as easily manageable rather than a severe debt burden. Instead, their principal concern is that, in view of the integration of global financial markets, and the extensive presence of derivatives in particular, a sharp decline in the dollar might precipitate international financial crises in a manner similar to the threat posed by the collapse of the Long Term Capital Management hedge fund in 1998. This concern is different from the traditional hard-landing concern about an abrupt rise in the US interest rate in the face of a collapsing dollar and a cutoff in capital inflows, with domestic recession in response to the higher interest rate.

Appendix 5A describes the Obstfeld-Rogoff model in greater detail. Although the authors' analysis is typically considered to be at the pessi-

mistic end of the spectrum of US external adjustment difficulty, it would appear to be no more so (and perhaps less) than the calculations of chapters 3 and 4 of the present study. Indeed, chapter 3 suggests that an additional 21 percent real foreign appreciation against the dollar beyond the January–May 2005 average level would be required just to reduce the US external deficit down to 3½ to 4 percent of GDP (versus complete elimination in Obstfeld-Rogoff), rather than growing to its 2010 baseline of about 7½ percent of GDP. The analysis of chapter 4 indicates that even this real depreciation could be insufficient for this task in the absence of large fiscal adjustment. The Obstfeld-Rogoff results are more consistent with the exchange rate estimates of the present study if their 5 percent of GDP correction is taken against the future baseline deficit of 7½ percent of GDP, however.

Whether the Obstfeld-Rogoff model is pessimistic also depends on whether their assumed parameter values are appropriate. They set the tradable sector of the economy at only 25 percent, yet in an earlier paper they cite a 50 percent share of GDP as nontradable as a ''popular rule of thumb'' based on the share of services, construction, and transport (Obstfeld and Rogoff 2000, 22). If the tradable share is boosted to 50 percent, then in their first case, with $\theta = 1$ and $\eta = 2$ (see appendix 5A), the required real exchange rate depreciation to eliminate the 5 percent of GDP external deficit (now only one-tenth rather than one-fifth of tradables) amounts to only 21 percent rather than 31 percent.

Long-Term Equilibrium Analyses

Blanchard, Giavazzi, and Sa (2005) also conclude that potentially large real depreciation is in store for the dollar, but that it can be stretched over time. They revive Kouri's (1983) portfolio preference approach to exchange rate determination, and augment it with special attention to exchange rate effects on the valuation of foreign assets and differential returns at home and abroad. The core idea in the portfolio approach is that when the United States runs a current account deficit, home bias causes the net demand for US assets to fall as wealth shifts from US to foreign citizens. The resulting excess supply of US assets will only disappear when there is enough dollar depreciation to reduce the foreign currency valuation of foreign holdings of US assets (original plus the new increment from the current account imbalance) to the desired foreign portfolio share for US assets.

The central result is that a country persistently running external deficits will face a secular depreciation of its currency. The pace of the depreciation can be slowed or even temporarily halted by shifts in foreign preferences (for example, reduction in home bias globally), but the depreciation will eventually occur. As discussed in appendix 5A, with the parameters used

by Blanchard, Giavazzi, and Sa, the current level of the US current account deficit of about $750 billion annually would imply an induced dollar depreciation of about 3.4 percent annually to meet the portfolio preference requirements, prior to taking into account exchange rate valuation and differential return effects. After taking account of valuation and differential return effects, the authors note that if the baseline for the NIIP is a steady decline of 5 percent of GDP annually, the upper bound for the anticipated rate of dollar depreciation would be 2.7 percent annually (Blanchard, Giavazzi, and Sa 2005, 47). However, they acknowledge that an adverse shift in portfolio preferences (such as diversification by foreign central banks away from dollars) could lead to a considerably larger short-term depreciation.

Blanchard, Giavazzi, and Sa examine the size of dollar depreciation that would be needed to stabilize the NIIP at −25 percent of GDP, an ambitious target. They set the trade balance as a function of the exchange rate, calibrated at a 1 percent of US GDP adjustment from a 15 percent depreciation. They take account of valuation effects assuming all US assets abroad are denominated in foreign currency and all US liabilities abroad are denominated in dollars. However, because about 42 percent of gross US foreign assets are in bonds and loans rather than equity (see table 2A.1), and these credits are typically denominated in dollars, their calibration would appear to overstate the valuation effect.[36] After also taking account of differential return on assets, and setting a target of 0.75 percent of GDP for the US current account deficit (rather than zero, based on 3 percent growth and maintenance of 25 percent of GDP in net external liabilities), they estimate that a depreciation of the dollar by 56 percent would be required to adjust the US deficit from its rate of about 6 percent of GDP.[37] This estimate is broadly consistent with the analyses of chapters 3 and 6 of the present study, if the less ambitious current account target here (a deficit of about 3 percent of GDP) is taken into account and the decline of the dollar that has already taken place from 2002 to the present is included in the total (as the Blanchard-Giavazzi-Sa analysis abstracts from lagged effects).[38]

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36. Thus, their estimate for the NIIP valuation effect from a 15 percent depreciation of the dollar is 10 percent of GDP (Blanchard, Giavazzi, and Sa 2005, 22), considerably larger than the 5 to 6 percent of GDP impact implied by the analyses in chapters 2 and 3 of the present study.

37. The authors abstract from inflation, however, which would raise the permissible deficit given the target NIIP/GDP ratio. In a private communication (May 17, 2005), Blanchard indicated that inflation should be added. However, he also noted that adjustment for inflation would approximately offset adjustment for a higher actual current account deficit—about 6.5 percent of GDP rather than 6 percent. That is, if inflation is 2 percent, then the adjusted current account target would be 2% × 0.25 = 0.5 percent of GDP higher; but the actual deficit base is also about 0.5 percent of GDP higher than in the exercise in the paper.

38. Note further that the 56 percent ''depreciation'' indicated by the authors is the rise in the real value of the foreign currency, as in chapter 3 here, not the proportional loss in value of the dollar (which would correspond to a decline of about 36 percent).

Blanchard, Giavazzi, and Sa (2005, 23) also note, however, that the US adjustment to a sustainable current account deficit does not have to occur immediately, because the rest of the world continues to be willing to lend to the United States, even ''if perhaps not at the current rate.'' Their central analysis thus implies a slow but steady dollar depreciation for a long time to come.

Gourinchas and Rey (2005) have developed a model of US external adjustment that emphasizes exchange rate and asset price effects, adding asset valuation changes to trade balance change as the means of external adjustment. Their two key conclusions are that (1) ''stabilizing valuation effects contribute as much as 31 percent of the external adjustment'' (2005, i), and that (2) ''the 2001–04 imbalance is less pronounced than that of the second half of the 1980s . . . due to the positive impact of the depreciation of the dollar in 2002–04 on US gross foreign assets and increased cross border holdings'' (2005, 26). As noted in chapter 2, their finding on the importance of exchange rate valuation effects is similar to that identified in the present study.

As set forth in appendix 5A, Gourinchas and Rey develop a variable *nxa* that is a weighted sum of the logarithm of exports minus the logarithm of imports and the logarithm of foreign assets minus the logarithm of foreign liabilities. The weights applied to each of these variables are determined in statistical regressions of *nxa* on the discounted sum of expected future net asset returns and increases in net exports.

The authors' underlying framework seems to be that the United States is pursuing a long-term downward path of net foreign assets relative to GDP, reaching ever-larger net external debt while running trade deficits. It is unclear in the model at what level the net US external debt stabilizes relative to GDP, if ever. What the model emphasizes is that whenever the net asset earnings and net export receipts are high enough to deflect the United States upward from this secular path, investors will push the dollar up, and conversely.

They thus argue that current imbalances as gauged by their summary measure *nxa* must predict either future export growth, or future movements in the net foreign asset portfolio, or both. Statistically, they find that ''deviations from trend of the ratio of net exports to net foreign assets predict net foreign asset portfolio returns one quarter to two years ahead and net exports at longer horizons.''[39] The main driver in the change in returns is the exchange rate. The exchange rate also drives the trade balance. Correspondingly, the authors find that their *nxa* variable successfully explains future exchange rate changes. They conclude that ''the curse

39. Their terminology is heuristic, because ''net exports to net foreign assets'' taken literally would explode as net assets transit through zero (from positive to negative), as has been the US experience.

of the random walk seems therefore to be broken. . . .''[40] Indeed, they can explain 60 percent of the variation in the exchange rate over a 3-year horizon, which would seem to be the econometric equivalent of capturing a unicorn if not finding the holy grail.

Gourinchas and Rey find that the US external imbalance as measured by their *nxa* was smaller in the first quarter of 2004 (at only −7 percent of exports) than in 1985 (−27 percent). This conclusion at first seems to be a major paradox, considering that the current account deficit in 2004 was nearly twice as large relative to GDP as the previous peak deficit in 1987 (at 5.7 versus 3.4 percent). The resolution of this paradox is partly that gross US foreign assets are also proportionately much larger today (7.7 times exports in 2004 compared with 4.5 times exports in 1985), providing a more robust base upon which the leveraged effect of depreciation can act.

The more important part of the paradox of ''lesser imbalance,'' however, seems to be the authors' implicit assumption that the trend line for US net foreign liabilities can continue to plumb depths that are beyond the ranges considered prudent for the United States by most analysts. The authors most decidedly do not mean that a reduction in the current account deficit by only 7 percent of exports, or about $80 billion, would be sufficient to hold the eventual ratio of net liabilities to GDP to anything like −25 percent or even −50 percent of GDP. Instead, the authors are focusing on what magnitude of imbalance it takes to generate market pressure on the exchange rate, in view of historical dynamics and after taking account of both valuation and trade effects. They predict that these pressures will cause the dollar to decline by 12 percent from the first quarter of 2004 to the first quarter of 2007. Considering that the actual change from the first quarter of 2004 to the first quarter of 2005 was a decline of 2.8 percent (Federal Reserve broad real index), it could be said that so far, their prediction is almost on track.

The paradox may also reflect the fact that by examining the intertemporal current account balance over an infinite horizon, Gourinchas and Rey may implicitly be allowing very large current account deficits at present because at some distant future date, the power of compound interest favoring asset returns will overwhelm the cumulated deficits. However, market participants may not have as much patience as the infinite horizon model requires, and instead may apply a risk discount factor that from their perspective turns the present value of future external balances negative. Indeed, the authors themselves do not specifically rule out a market panic that involves a departure from past behavior.

The main point is that their method focuses on current market pressures, not on eventual sustainability of the current account and net external

40. Meese and Rogoff (1983) first showed the long-standing proposition that economic models do no better than a ''random walk'' in predicting exchange rates.

debt. It would have been highly informative if the authors had included the long-term path of the current account and net external liabilities implied by their analysis (e.g., over the next 20 years), as it seems likely that this path would involve much larger deficits and net debt than most analysts would consider sustainable. In a sense, their finding is discouraging, because it suggests that the market left to its own devices will allow the United States to accumulate far more external debt than might be consistent with long-term equity or optimality, along the lines analyzed above in the discussion of early versus delayed adjustment. At the least, it is important that readers of their provocative analysis recognize that they are not claiming that the United States is close to external equilibrium when judged against the more conventional benchmarks for longer-term sustainability. In this regard, the quantitative results of Gourinchas and Rey may be much closer to the diagnoses of major long-term depreciation prospects identified by Obstfeld and Rogoff and by Blanchard, Giavazzi, and Sa than might appear to be the case at first reading.

Recent Federal Reserve Analyses

In early 2005, certain Federal Reserve staff studies and governors' speeches seemed to challenge the growing concern that the US external deficit was a serious problem, and especially that it had been caused by US policy mistakes.[41]

The first study, by Croke, Kamin, and Leduc (2005, ii), explicitly addressed growing concerns in the press about a ''disorderly correction'' involving ''a sharp fall in the exchange rate that boosts interest rates, depresses stock prices, and weakens economic activity.'' They found ''little evidence'' in past adjustment episodes for the disorderly correction hypothesis, maintaining instead that ''it was among the episodes where GDP growth picked up during adjustment that the most substantial depreciations of real exchange rates occurred.''

The methodology of the study is highly transparent. The authors identify 23 current account adjustment episodes in industrial countries over the past several decades.[42] They compare the seven most expansionary

41. Edwin C. Truman, a former senior official of the Fed, has written that ''. . . too many Federal Reserve officials are interpreted as being cheerleaders for the view that the adjustment process when it comes will be smooth, rather than warning that the process might well be disruptive and unpleasant'' (Truman 2005). He notes, however, that two prominent Federal Reserve representatives—Geithner (2005) and Gramlich (2004)—have been more cautious.

42. Following Freund (2000), Croke, Kamin, and Leduc defined an adjustment episode as one in which the current account deficit exceeded 2 percent of GDP before being reversed, and fell by at least 2 percent of GDP, and at least one-third, over three years; and one in which the maximum deficit in the five years following adjustment did not exceed the maximum in the three years before adjustment.

episodes (largest increase in growth rate from before the onset of adjustment to after) against the seven most contractionary episodes (largest declines in growth rate). The US adjustment episode beginning in 1987 is in the expansionary group.

The differences they identify include the following. First, the size of the current account imbalance was larger for the contractionary episodes (designated here as C) than in expansionary cases (E). Whereas both groups had current account deficits averaging 2 percent of GDP two years prior to the adjustment, for the C group, the deficit had widened to an average of 6 percent by year zero, whereas for the E group it had reached only 3 percent of GDP. Curiously, the authors do not note that by this metric, the United States would presently qualify as a good candidate for a contractionary episode in its near future, as the US current account deficit has reached 6 percent of GDP. In any event, this difference would seem to confirm the intuition: that the potential for an unfavorable growth experience with external adjustment is greater if the current account deficit to be corrected is larger.

Second, growth starts out above the OECD average before adjustment in the C group and then falls well below it, whereas growth in E episodes starts out well below the OECD average and then moves toward that average in adjustment. For the E group, growth averaged only 1 percent annually prior to adjustment, but climbed to an average of about 2½ percent in the two years after the onset of adjustment. In contrast, for the C group, growth averaged about 4 percent prior to adjustment, but fell to an average of about zero in years 1 and 2 after the onset of adjustment. The authors infer that the C episodes involve overheating of the economy before the adjustment. Again, although the authors do not so state, the recent pace of US growth relative to OECD growth would seem at present to make the United States more a candidate for future C rather than E adjustment. Even though US growth may not involve overheating of the economy as in some of the C cases, for external accounts the foreign-domestic growth differential may matter more than whether overheating has occurred. As for inflation, there is little difference between the two groups.

Third, the real exchange rate behaves differently between the groups. For the E group, the real exchange rate depreciates through most of the period, consistent with lagged current account adjustment in response to the real exchange rate. For the C group, however, the real exchange rate remains essentially unchanged, suggesting that the burden of adjustment fell to demand contraction through slow growth or recession. It is this result—the real exchange rate story—that the authors emphasize in dispelling the ''disorderly adjustment'' hypothesis (also known as the ''hard landing,'' although the authors do not use that term), which typically depicts problems as stemming from a plunge in the exchange rate. The implication is that the significant downward movement in the real value of the dollar already, and likely substantial further real depreciation,

would be more likely to prompt US expansion (à la group E) than precipitate a hard landing.

Fourth, real stock market prices decline for both C and E groups from two years before the adjustment to year 0. In contrast, once adjustment begins, real stock market prices rise for the E group but fall sharply in the C group before rebounding.

Fifth, neither real long-term interest rates nor real policy rates differ much between the C and E groups. This too undermines the disorderly adjustment hypothesis, which turns importantly on a surge in interest rates.

Sixth, there is a sharp contrast between the two groups in the behavior of saving and investment. In the C group, the external imbalance is associated with a large rise in investment that outstrips saving, and the adjustment involves a sharp decline in investment. In the E group, the preadjustment gap is narrower, and the correction involves a more even allocation of adjustment between moderately higher saving and moderately lower investment. This pattern also sets the E group apart from the sample as a whole, for which reduction in investment is the dominant adjustment mechanism.

Seventh, whereas real export growth is steady and about the same for the two groups, in the C group, imports decline during the adjustment, but in the E group they continue to grow. The authors find, however, that ''. . . the ratio of imports to exports is much lower among the expansion episodes than the contraction episodes. For a given growth rate of exports and imports, the smaller the ratio of imports to exports, the larger the reduction in the trade deficit. Thus, the expansion episodes are able to achieve the same degree of current account adjustment as the contraction episodes, but with less import compression'' (Croke, Kamin, and Leduc 2005). Here again is a smoking gun for the United States, although the authors do not draw the inference. The ratio of exports to imports is extremely low for the United States, so past episodes would seem once again to suggest that the United States is more a candidate for contractionary future adjustment than for expansionary adjustment.

Finally, the authors do not find significant differences between the two groups for movements in cyclically adjusted fiscal balances or for changes in NIIPs.

Overall, the findings of Croke, Kamin, and Leduc (2005) would seem to bolster their critique of the usual formulation of the hard-landing scenario—that a sharp real depreciation is the trigger for a surge in interest rates and a recession. Instead, they emphasize that a sharp real depreciation has been a feature of expansionary adjustments. However, reading between the lines, their findings also paint a darker picture for the United States, which currently seems consistently to have features associated with past contractionary adjustments: a high ratio of imports to exports, an imbalance on the order of 6 percent of GDP rather than 3 percent, and

recent growth well above the OECD average rather than below it. By focusing on the ''disorderly'' hypothesis, the authors (and those who cite their study) may have called insufficient attention to the prospect that the adjustment could nonetheless be painful (i.e., contractionary). Indeed, if the United States comes to resemble a contractionary episode adjustment, the expected path of growth would be a decline from about 4 percent to a couple of years of zero growth. Such a path might be orderly but it would be unpleasant.

In early 2005, several Federal Reserve officials cited an important recent staff study by Erceg, Guerrieri, and Gust (2005) to the effect that $1 in fiscal adjustment would only bring about 20 cents in adjustment of the current account deficit. Bernanke (2005) and Ferguson (2005), in particular, invoke this estimate to downplay the role of the widening US fiscal deficit in explaining the rise in the current account deficit. A closer look at the new macroeconomic model developed in that study, called SIGMA, suggests instead that this type of interpretation may be misleading and that a more appropriate interpretation is that fiscal deterioration probably did play an important role and fiscal correction will be central to US external adjustment.

The SIGMA model is in the ''new'' school of central bank models that are dynamic general equilibrium models of intermediate size, heavily based on consistency with microeconomic theory and dependent on ''calibration'' (as distinct from econometric estimation) of numerous parameters. Several key features of the model suggest that it is inappropriate to use it in the summary fashion that, for example, Bernanke (2005) does to downplay the scope for external adjustment through fiscal adjustment.

First, the model applies ''Ricardian equivalence'' to half of consumers. This principle means that when households see the government's deficit rising, they reduce their consumption and increase their saving against the day when they will have to pay higher taxes once the government finally comes to its senses. Placing the Ricardian offset to fiscal policy at something like 50 percent is increasingly common in macroeconomic modeling (see Campbell and Mankiw 1989). This means that any fiscal expansion (contraction) of $1 only reduces (increases) national saving by 50 cents, all else being equal, because of induced changes in private saving in the opposite direction. SIGMA incorporates this effect by treating half of all households as Ricardian and the rest as having ''rule of thumb'' behavior (spending whatever is their disposable income).

The Ricardian assumption should be increasingly suspect, however. In recent years, the private saving rate has not shown a strong rebound to offset the sharp swing of the fiscal balance from surplus to deficit. Personal saving fell from 3.4 percent of GDP in 1995 to 1.7 percent in 2000 and only 0.87 percent in 2004 (BEA 2005d). If instead Ricardian equivalence applied to even half of households, personal saving should have risen from 1.7 percent of GDP in 2000 to 4.5 percent in 2004 in response to the

collapse of total government saving from 4.4 percent of GDP to −1.2 percent (see table 4.1 in chapter 4). It is highly implausible to argue that if the government now improved its fiscal balance (and hence government saving) by, say, 3 percent of GDP, households would offset this by plunging into negative saving at about −2 percent of GDP (or, if the Ricardian offset is only one half, to −0.63 percent of GDP (= 0.87 − 0.5 × 3). But without the Ricardian assumption, the model would show much more effective change in national saving from each dollar of change in fiscal saving. As a result, there would be a stronger current account adjustment resulting from fiscal adjustment.

Second, SIGMA and other models like it implicitly begin from a state of long-term equilibrium. Any shock is treated as a disturbance. There are fiscal and monetary ''reaction functions'' that are premised on returning the economy back toward equilibrium. It is not appropriate, however, to apply this setup when the underlying path of the economy is toward disequilibrium, as is currently the case with both the US fiscal and external deficits. In particular, the model assumes that when there is a $1 shock of increased government spending, there is a ''fiscal reaction function'' that subsequently raises taxes in order to reduce the deficit back toward a level consistent with the long-term target ratio of debt to GDP. But surely the whole point, in the present context, is that $1 in reduction of the fiscal deficit (whether by higher taxes or reduced spending) would not induce an eroding ''fiscal reaction'' because it would move the economy closer to rather than away from long-term fiscal equilibrium. In short, it is inappropriate to leave the fiscal reaction function unchanged when the underlying baseline of the economy is not in long-term equilibrium.

The consequence of the fiscal reaction function in SIGMA is that the ''fiscal shock'' of $1 is itself shrunk relatively to a much smaller amount: only 45 cents by the fifth year (Erceg, Guerrieri, and Gust 2005, 36). The trade balance impact of 15 cents by this time is thus a higher fraction of the actual fiscal change, or one-third, than the 0.2 fraction emphasized in recent statements by Federal Reserve officials. Moreover, the trade balance effect does not include the interest earnings effects or changes in equity capital earnings from currency valuation effects on the stock of foreign equity assets. In the principal macro model used by the Federal Reserve Board for international analysis (FRB/Global), the total current account impact of a fiscal shock is about three-fourths larger than the trade balance impact.[43] So the overall ratio of the current account adjustment to the de facto fiscal adjustment is even higher, and likely in the same vicinity as

43. A sustained government spending reduction of 1 percent of GDP generated a three-year average increase of 0.18 percent of GDP in the trade balance and a 0.3 percent of GDP increase in the current account balance in the 1997 version of FRB/Global. See Levin, Rogers, and Tryon (1997, 18).

the 40 percent ratio identified just for the trade balance in the simple general equilibrium model set forth in chapter 4. (For further discussion of the issues involved in interpreting the SIGMA model, see the discussion of interpreting macroeconomic model simulations in appendix 5A.)

Federal Reserve Vice Chairman Ferguson (2005) provides an important statement and analysis by a leading Federal Reserve official. His diagnosis assigns an even smaller role to fiscal deterioration in explaining the widening US current account deficit. On the basis of special runs of the FRB/Global model, he estimates that a 3 percent of GDP structural erosion in the US fiscal position from the beginning of 2002 to the end of 2004 (comprised of 1 percent from higher spending and 2 percent from tax cuts) contributed only 0.15 percent of GDP to the total 4 percent of GDP decline in the trade balance of goods and services (from -1.3 to -5.3 percent of GDP) from 1997 to 2004.[44] On the face of it, this estimate is extraordinarily small and seemingly inconsistent with other Federal Reserve model estimates, which typically show an impact of about 0.2 percent of GDP for each 1 percent fiscal shock (Erceg, Guerrieri, and Gust 2005; Levin, Rogers, and Tryon 1997). In contrast, the corresponding implied parameter in the Ferguson runs is only a 0.05 percent of GDP trade balance change for each 1 percent of GDP fiscal shock (i.e., 0.15/3).

Ferguson instead emphasizes the increase in productivity growth as another directly measured impact, as well as three effects treated residually: reduction in investment in the G-7 (excluding the United States) and in East Asia (excluding China); autonomous reduction in US private saving; and increased global financial integration (reduction in home bias, treated as a reduction in the US ''risk premium'' levied by foreign investors). However, the residual treatment of the latter three influences means their measurement is at best speculative and dependent on proper measurement of the other two influences. The method allocates one-third of the residual to each of the three. They wind up each accounting for a 0.5 percent of GDP reduction in the US trade balance.[45] There is perhaps important information on the ambiguity of these measurements in the finding that whereas Bernanke (2005) attributes the lion's share of US external balance erosion from 1997 to the global saving glut (also known as the global investment collapse), Ferguson at best attributes a lamb's share (one-eighth).

The direct measurement in Ferguson for the productivity acceleration impact is based on the model's corresponding calculation of an induced increase in investment by 1 percent of GDP, and a reduction in private saving by 1 percent of GDP in response to households' expectations of

44. The fiscal impact of only 0.15 percent is inferred by measurement from figure 2 of the appendix to Ferguson (2005).

45. Again inferred by physical measurement of the graphs provided in the study.

higher future incomes. An offsetting influence is a depreciation of the real exchange rate, caused by the model treatment of domestic versus foreign inflation. The productivity shock curbs US inflation, whereas foreign inflation continues apace, contributing a real depreciation of the dollar. This is just the opposite of what many argue was the main influence of the productivity growth shock: an appreciation of the dollar spurred by an inflow of capital in response to improved investment opportunities.

As for the autonomous saving effect, foreign investment collapse effect, and dollar risk premium effect, their calibration as the residual necessary to fill the gap would seem to make them of limited use other than as reminders that these influences may have been present. Overall, while the Ferguson study usefully reminds us of major possible explanations of the US current account erosion, its seeming precision based on its use of the FRB/Global model would appear basically misleading. On the most important policy issue—the role of fiscal policy—the study gives a de minimus impact that is inconsistent with larger effects implied by other model estimates at the Federal Reserve and elsewhere.

Global Saving Glut?

The ''global saving glut'' argument of Ben S. Bernanke (2005), formerly a Federal Reserve Board governor and now chairman of the Council of Economic Advisers, is a particularly trenchant version of the approach downplaying both the severity of the problem of external imbalance and the role of fiscal policy in either causing or resolving it. Bernanke rejects the idea that the growing US external deficit ''*primarily* represents economic policies'' (2005, 1). Instead, he argues that the decline in US saving is largely an endogenous reaction to the ''emergence of a global saving glut in the past eight to ten years'' associated with rising saving in wealthy countries with aging populations and, more importantly, the ''metamorphosis of the developing world from a net user to a net supplier of funds to international capital markets'' (2005, 4). He notes that the counterpart of the increase of the US current account deficit by $546 billion from 1996 to 2004 was primarily in developing countries, whose aggregate current account shifted by $416 billion (from a deficit of $90 billion to a surplus of $326 billion). He points to the financial crises in East Asia and Russia in 1997–98, Brazil in 1999, and Argentina in 2002 as motivating forces that started many developing countries on a path of building up reserves as a ''war chest'' and promoting export-led growth by preventing exchange rate appreciation. East Asian countries maintained their high saving rates even as their domestic investment fell.

Bernanke argues that the global saving glut contributed to low interest rates in the United States, and that this in turn spurred a housing boom that increased home values. This, together with a recovery in the stock

market, boosted the ratio of household wealth to income back to 5.4, well above its 1960–2003 average of 4.8 (albeit below the peak of 6.2 in 1999). With rising wealth, households felt less need to save. As for the fiscal deficit, Bernanke cites the Erceg, Guerrieri, and Gust (2005) model result that each dollar of fiscal correction leads to only 20 cents of current account adjustment as a basis for downplaying the importance of fiscal erosion (and the efficacy of fiscal adjustment for external adjustment). Although he laments that ''for the developing world to be lending large sums on net to the mature industrial economies is quite undesirable,'' he sees little reason why the adjustment process should not be smooth. He expects that ''the various factors underlying the U.S. current account deficit—both domestic and international—are likely to unwind only gradually. . .'' and that ''we probably have little choice except to be patient as we work to create the conditions in which a greater share of global saving can be redirected away from the United States and toward the rest of the world—particularly the developing nations'' (2005, 14).

This view undoubtedly contains a kernel of truth. For example, the decline in East Asian investment rates no doubt contributed to weaker exchange rates and a shift of demand from investment to exports. However, there is no reason that the entirety of the external impact should have shown up in the US external deficit rather than being much more widely dispersed, in the absence of strong domestic US influences and especially fiscal erosion to shape this outcome. Ultimately, the argument, which amounts to saying that the US current account deficit is mainly attributable to causes from abroad rather than policies and behavior at home, is unconvincing. Worse, it is counterproductive in terms of keeping attention focused on the need to implement forceful US fiscal adjustment.

At one level, the statement that the US current account deficit represents a global saving glut is a tautology. By definition, the current account equals the excess of investment over domestic saving. Also by definition, if the United States has a current account deficit, the rest of the world in the aggregate has a corresponding current account surplus (aside from statistical discrepancies). If ''glut'' is defined as ''excess,'' then it follows that the rest of the world has a saving glut and the United States has a saving ''dearth'' or shortfall.

The economic content of the argument turns on understanding the sources of swings in the saving-investment imbalances. Table 5.1 shows the change in saving and investment rates by major countries and regions from 1997 to 2004. Aggregate saving and investment rates are obtained weighting by GDP. The differences between the saving and investment rates in principle equal the current account balance as a percent of GDP, although there are relatively small statistical discrepancies. These data confirm that there was a decline in the investment rate in East Asia excluding China—from 32 to 25 percent of GDP in the newly industrial-

Table 5.1 Global saving, investment, current accounts, and GDP, 1997 and 2004 (in percentage of GDP and in billions of dollars)

	1997					2004				
	s	i	s–i	ca	GDP (billions of dollars)	s	i	s–i	ca	GDP (billions of dollars)
United States	17.6	19.8	−2.2	−1.6	8,304	13.6	19.6	−6.0	−5.7	11,734
Euro area	21.7	20.3	1.4	1.5	6,534	20.9	20.2	0.7	0.4	9,397
Japan	30.9	28.7	2.2	2.2	4,313	27.6	23.9	3.7	3.7	4,668
United Kingdom	17.0	17.1	−0.1	−0.1	1,327	14.8	17.0	−2.2	−2.2	2,295
NIEs	32.8	32.4	0.4	0.5	1,087	31.3	24.9	6.4	7.1	1,258
China	41.8	38.0	3.8	3.8	898	51.2	47.0	4.2	4.2	1,649
ASEAN-4	28.0	38.0	−10.0	−3.0	570	26.5	22.0	4.5	5.5	624
Latin America	19.2	22.6	−3.4	−3.3	2,003	21.0	19.8	1.2	0.8	1,998
Middle East	26.1	24.6	1.5	1.7	545	32.0	25.4	6.6	17.3	822
Africa	17.6	19.8	−2.2	−1.4	444	20.6	21.0	−0.4	0.2	680
Subtotal	22.8	23.1	−0.3	0.1	26,025	21.1	21.9	−0.7	−0.4	35,125
o/w non-US	25.2	24.7	0.5	0.9	17,721	24.9	23.0	1.9	2.2	23,391
o/w NAL	24.6	27.9	−3.3	−2.1	3,660	24.9	21.7	3.3	3.6	3,880
Rest of world	n.a.	n.a.	n.a.	n.a.	3,742	n.a.	n.a.	n.a.	n.a.	5,546
World	n.a.	n.a.	n.a.	n.a.	29,768	n.a.	n.a.	n.a.	n.a.	40,671

s = saving
i = investment
ca = current account
NIEs = newly industrialized economies (Korea, Hong Kong, Singapore, and Taiwan)
ASEAN-4 = Association of Southeast Asian Nations (Indonesia, Malaysia, Philippines, and Thailand)
NAL = includes the NIEs, the ASEAN-4, and Latin America
n.a. = not applicable

Sources: IMF (2005b) and Rajan (2005).

ized economies (NIEs) and from 38 to 22 percent of GDP in the Association of Southeast Asian Nations (ASEAN-4)—and, to a lesser extent, in Latin America (from about 23 to 20 percent). In China, in contrast, investment rose sharply, but so did the rate of saving. The table also shows the sharp drop in the saving rate in the United States, by 4 percentage points of GDP, and the corresponding rise in the US current account deficit by the same amount.

One test of the Bernanke hypothesis would be to see whether the size of the investment decline in the developing countries facing financial difficulties in this period can explain the drop in US saving, based on the argument that these countries' excess saving induced saving reductions in the rest of the world including the United States. If the NIEs, ASEAN-4, and Latin America are aggregated to a grouping labeled NAL, their average investment rate fell from about 28 to 22 percent of GDP, while the saving rate remained unchanged at about 25 percent. So it can be postulated that the financial crises and the resulting drop in investment (as well as aggressive export responses to the crises) caused these countries to generate a swing of 6.6 percent of their GDP into excess saving imposed on the rest of the world. Applied to 2004 GDP, that amounted to $256 billion.

Global GDP outside the affected NAL countries stood at $36.8 trillion in 2004. So the upswing in excess saving from the NAL countries amounted to 0.7 percent of non-NAL GDP. By this test, the Bernanke thesis is rejected. The new saving glut should only have induced excess saving for the United States equal to 0.7 percent of GDP. Instead, US saving fell by 4 percent of GDP. Bernanke (2005, 9) addresses this discrepancy by arguing that the United States disproportionately absorbed the upswing in net foreign saving because of the attractiveness of investment there during the technology boom of the 1990s and because of the sophistication of the country's financial markets. Suppose these advantages made it twice as likely that the excess saving would flow to the United States as to other countries. Then the discrepancy would still remain and still be large—a 4 percent of GDP US saving decline versus a 1.4 percent of US GDP infusion of excess saving from the NAL group.

The ''Occam's razor'' principle applied by economists—the simplest explanation for a phenomenon—would surely suggest instead that the driving force in the drop in US saving was the conscious adoption of fiscal policy changes that reduced the contribution of the fiscal accounts to US saving. As noted in chapter 4, the OECD has estimated that after taking out cyclical influences, the US tax cuts of the past four years have eroded the fiscal balance by 2.6 percent of GDP. On the basis of the comparisons just discussed, *US fiscal policy is responsible for two to four times as much reduction in US saving as can plausibly be attributed to developing country financial crises*. (The lower figure assumes US attractiveness doubles its global share; the higher figure assumes the share is only proportional to US GDP.)

A crucial policy judgment in Bernanke's analysis is that fiscal deterioration was not much to blame for the widening US external deficit. In support, he cites the Erceg, Guerrieri, and Gust (2005) simulations indicating only 20 cents of trade adjustment for each dollar of fiscal adjustment. However, as discussed here, this parameter is likely to understate both the role of recent fiscal erosion in driving the rising external deficit as well as the potential for fiscal correction to narrow the current account deficit. Instead, it is more reasonable to stick to the ''smoking gun'' of 2.6 percent of US GDP saving erosion from fiscal policy change and the decline in the personal saving rate as the driving forces in the widening US external imbalance than it is to blame an inflow of excess global saving. After all, foreigners did not force the United States to cut taxes, nor did they force US households rather than European ones to cut back their saving.

Another of Bernanke's arguments, however, is that the global saving glut is the source of low US interest rates, which in turn spurred the housing boom and curbed household saving as higher home prices provided wealth accumulation without saving. But how strong is the evidence that external saving was the source of lower interest rates? There is a problem for this argument with respect to the timing. The height of the East Asian, Russian, and Brazilian crises was 1998–99. Allowing for some lag, a major saving glut, supply-side push on capital markets should have depressed the interest rate in 1999–2000. Instead, the 10-year bond rate rose from 5.3 percent in 1998 to an average of 5.8 percent in 1999–2000.

The most dramatic subsequent influence on US interest rates was the reduction in the Federal Reserve's policy rate in an effort to counter the 2001 recession. The federal funds rate fell from 6.0 percent in 2000 to 1.7 percent in 2002 and 1.1 percent in 2003 (IMF 2005b). But the test of external interest rate influences would have to show up in the rate not controlled by the Federal Reserve—the long-term bond rate. Unfortunately for the Bernanke hypothesis, the gap between this rate and the federal funds rate—the ''yield curve spread''—widened rather than narrowing. By 2003, the spread between the 10-year bond rate and the federal funds rate stood at 294 basis points, up from virtually zero in 1998 and −20 basis points in 2000. To be sure, the main cause of the shift from an inverted to a steeply positive yield curve was the swing from over full employment in 2000 to recession in 2001 and low-employment recovery thereafter, as the Federal Reserve kept the policy rate at historically low levels in light of low inflation and unused capacity. Nonetheless, if by 2003, there had been enormous downward pressure on US interest rates from an external saving glut, surely the yield curve spread between the long-bond rate and the federal funds rate would have been relatively low. Instead, the nearly 300 basis point spread in 2003 and again in 2004 was among the highest on record. In comparison, the simple average spread between the

federal funds and 10-year bond rates for 1960–2004 was only 89 basis points (IMF 2005b). Low US interest rates after 2001 were thus made in America, not in East Asia and Latin America.

Finally, another weak link in the saving glut argument is its premise that private saving abroad has come in large volume to the United States in the absence of sufficient investment opportunities abroad, whereas increasingly it has been foreign buildup of official reserves that has financed the increase in the US current account deficit. In gauging private versus official flows for purposes of examining the saving glut argument, it is appropriate to consider the net private inflows after deducting US private outflows. After all, if the argument is that there are few investment opportunities abroad compared with saving abroad, then we would not expect that phenomenon to be siphoning private capital out of the United States; American investors would also find the pickings slim abroad. When US private outflows are deducted, net private capital inflows to the United States averaged $276 billion annually in 2003–04, compared with official capital inflows averaging $302 billion.[46] With more than half of net capital inflows coming from the foreign public sector rather than the private sector, the argument that the US current account deficit is caused primarily by private savers abroad seeking investment opportunities rings hollow. On the contrary, the major role of foreign central banks means that the large US current account deficit is being sustained despite the lack of adequate financing for it from the private sector alone. In contrast, foreign official capital inflows during 1998–2001 averaged a meager $24 billion annually (BEA 2005c).

Macro Model Biases?

There may be a danger of downward bias in judging the potential impact of fiscal adjustment in correcting the external deficit in the class of models represented by FRB/Global and the ''new'' generation of smaller but more theoretically elegant models now being tested in many central banks (Faust 2005), as exemplified by Erceg, Guerrieri, and Gust (2005). In short, the problem is that this type of model may exaggerate the extent to which a fiscal shock induces output change in the short run (Keynesian structure), while exaggerating changes in domestic consumption and investment rather than changes in the trade balance in the long run. Both effects will downplay the trade balance change.

Consider the fiscal experiment in Ferguson (2005). In this experiment, the private saving rate rises by 2 percent of GDP when there is fiscal expansion of 3 percent of GDP (appendix figure 2 in the paper). But this

46. The corresponding gross private averages were $554 billion annually in outflows versus $829 billion annually in inflows.

change is not the consequence of a Ricardian offset (absent in the FRB/Global model); nor is it the consequence of lower absolute consumption from a higher interest rate. Instead, it reflects approximately unchanged consumption in the face of higher output.[47] That then turns our attention to what is happening to output, and how this influences the impact of fiscal expansion on the external balance.

As shown in appendix 5A, the macroeconomic models will tend to understate any impact of fiscal adjustment on the current account in the short run because of their Keynesian feature, whereby output changes by almost exactly the same amount as the change in government spending, leaving no room in the national accounts identity for a change in the trade balance. Yet in the medium or longer run, when output is constrained to potential capacity, the same class of models may also tend to understate the external adjustment because of parameter calibration of effects from induced monetary policy change, induced fiscal policy change, and Ricardian-equivalence household saving changes. So the models may show little impact of fiscal adjustment on the external accounts in either the short run or the medium to longer run.

Allowing output to revert toward capacity through trade balance change rather than these sorts of offsets can, however, imply a much larger space for the trade balance to improve in response to fiscal tightening. The fiscal adjustment curbs income and hence the demand for imports (''expenditure reduction''). It also reduces interest rates—the lower interest rate induces a depreciation, and the more attractive exchange rate stimulates exports and curbs imports (''expenditure switching''; see Meade 1951). If the overall trade response is strong enough, then the maintenance of output at capacity level may occur considerably more through external adjustment, and considerably less through domestic demand revival by induced monetary loosening, induced fiscal (reaction-function) loosening, or a Ricardian household consumption increase than the models permit.

The FRB/Global and SIGMA models may indeed understate the scope for exchange rate change in response to the interest rate in particular, and as a consequence, understate the scope for change in the trade balance to contribute to equilibration of total demand back toward domestic output supply in response to an expansionary fiscal shock. The simulations in Ferguson (2005) certainly seem to imply an understatement of the impact on exchange rates. The shock is 3 percent of GDP fiscal expansion, but the real exchange rate rises only 1 percent. The small trade balance change (0.15 percent of GDP) approximately reflects applying an export price elasticity of 1.5 to the export base of nearly 10 percent of GDP combined with a 1 percent real exchange rate appreciation (and with

47. Christopher Erceg, personal communication, May 13, 2005.

minimal adjustment of the nominal import bill because the price effect is working against the volume effect).

With a short-term multiplier of about unity, a 3 percent of GDP fiscal expansion would boost output 3 percent above capacity, and by the Taylor rule, cause the Federal Reserve to boost interest rates by 150 basis points. By the Gale-Orzag parameter for crowding out effects, moreover, the 3 percent of GDP deficit would add another 0.9 percentage point to the interest rate. Overall, the interest rate increase would be on the order of 2.5 percent. The calibration of the simple model in chapter 4 assumes that a 1 percentage point rise in the interest rate boosts the exchange rate by 5 percent, implying a rise by about 12 percent in the real exchange rate—an order of magnitude larger than the 1 percent rise in the Ferguson fiscal simulation. On this basis, there are grounds for suspecting that the responsiveness of the exchange rate to the interest rate is understated in the FRB/Global and SIGMA models, and that this in turn leads to an understatement in the adjustment of the trade balance even if the trade price elasticities are appropriate.

Pass-through and Adjustment Prospects

Finally, recent statistical work has tended to show a decline of the import price pass-through ratio over time. Marazzi, Sheets, and Vigfusson (2005) estimate that the pass-through ratio has fallen from about 0.6 in the early 1990s to about 0.4 during 1998–2004.[48] As possible causes of the decline, they cite the falling share of industrial supplies (excluding oil) in imports, considering that industrial supplies have typically had higher import pass-through ratios than other goods; the rising share of China in imports, considering that China has maintained a fixed exchange rate against the dollar; and a seeming shift of East Asian economies toward more fully pricing to the US market in the aftermath of the 1997–98 financial crisis than before. They find a statistically significant relationship between the size of the decline in the pass-through ratio by sector and the size of the increase in China's market share by sector.

Some observers appear to be concerned that a decline in the import price pass-through would be adverse to US external adjustment. However, as Marazzi, Sheets, and Vigfusson (2005) explicitly recognize, if the price elasticity of demand for imports is unity rather than greater than unity, the size of the pass-through does not affect adjustment of the nominal

48. This is their result for the model excluding commodity prices as a separate explanatory variable. There is no clear reason why commodity prices should be included, because to the extent that they affect foreign production costs, their impact should already show up in foreign prices as translated through the exchange rate. The authors emphasize instead their results with commodity prices directly included in the regression equation; in this case the decline is from about 0.5 in the 1980s to about 0.2 during the past decade.

import bill. That is, with a price elasticity of −1, the decline in the quantity imported just offsets the rise in the import price to leave the dollar value of imports unchanged when the dollar declines, so it does not matter whether the import price change ''passed through'' from the exchange rate is high or low. The import price elasticity is usually estimated at about unity, so the pass-through issue should not cause much if any difficulty for US adjustment in nominal terms.

Moreover, in terms of the real welfare loss to be expected from eventual US correction of the external imbalance, it is actually more favorable for the United States to have a low than a high import price pass-through. The reason is that the United States will not need to give up as much in real import volume to accomplish the same external adjustment. Another way of looking at the same point is to recognize that if foreign suppliers adjust to a decline in the dollar by reducing their profit margins and holding their dollar price in the US market almost unchanged, there will be much less terms of trade loss for the United States than if foreign suppliers keep profit margins unchanged and boost dollar prices to make up for the lesser value of the dollars earned. With unitary import price elasticity, the nominal adjustment must occur on the export side in any event. Similarly, monetary policy faces a less difficult task in the external adjustment process if import pass-through is lower, because there will be less upward pressure on the US price level from a given depreciation of the dollar. In broad terms, then, if import price pass-through has indeed declined, it should be a cause for comfort rather than concern regarding the scope for US external adjustment.

Appendix 5A
Key Features of Leading Recent Analyses

Obstfeld and Rogoff (2004)

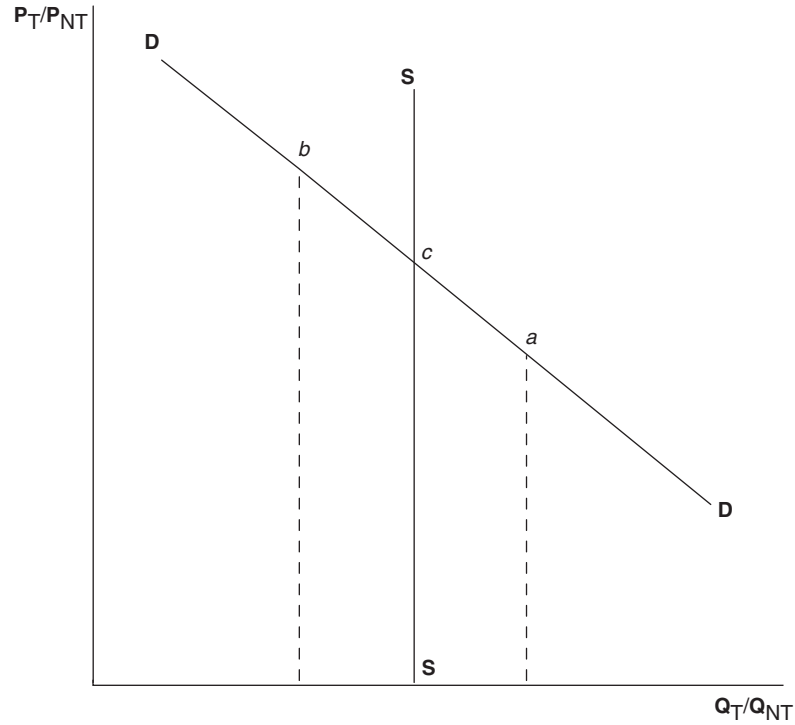
The Obstfeld-Rogoff model summarized in the main text is as follows. There are two countries: the home country and the foreign country (indicated by an asterisk). Each country has a tradable sector (T) and a nontradable sector (N). Capital and labor in each sector are assumed to be fixed, which is an important source of potential rigidity and hence difficulty of adjustment in the model. The home country is forced to eliminate a deficit of 5 percent of its GDP (i.e., approximately the size of the US current account deficit), and can only do so by cutting back consumption of tradables. The authors place T at 25 percent of GDP and N at 75 percent, so the cutback amounts to $5/25 = 20$ percent of tradable goods production. This is their first point: The US external adjustment is much larger relative to tradables than it is relative to GDP.

Figure 5A.1 shows how adjustment occurs in this type of model. The supply-demand graph applies to each country. It shows the quantity of tradables relative to the quantity of nontradables on the horizontal axis, and the price of tradables relative to the price of nontradables on the vertical axis. The home country is at a point such as *a*, where the relative quantity of tradables sought by consumers along the demand curve exceeds the relative quantity produced domestically. The foreign country is at a point such as *b*, where the opposite is true. When the home country is forced to adjust, it must reduce its ratio of tradables consumed relative to nontradables to point *c*, because eliminating the trade deficit means consumption matches domestic production. With fixed output in each sector, the only way to do this is to suppress consumer demand for tradables by raising their price, thereby reducing the quantity of tradables demanded by enough to eliminate the trade deficit.

Obstfeld-Rogoff define the real exchange rate as the ratio of the average price in the foreign country to that in the home country: $q = E(P^*/P)$, essentially the ratio of the two GDP deflators. This is the Latin American definition rather than the US definition, because a higher real exchange rate means the home country is more competitive. The economy-wide price level is the weighted average of the sectoral price levels, using a constant-elasticity of substitution demand structure: $P = [\gamma P_T^{1-\theta} + (1 - \gamma)P_N^{1-\theta}]^{1/(1-\theta)}$, where γ is the share of tradables in GDP (set at 0.25) and θ is the elasticity of substitution in demand between the two sectors (defined as $\theta > 0$).

If the elasticity of substitution between tradables and nontradables in demand is unity, and the demand for tradables in the home country needs to decline by 20 percent, the price of tradables relative to nontradables

Figure 5A.1 Supply and demand for tradables and nontradables



must increase 20 percent. The mirror image occurs in the foreign country, but is dampened because the foreign country is the rest of the world and is larger than the home economy. The authors put the foreign country at about three times the size of the US (home) economy.

The key equation in the model shows the real exchange rate as a function of the nominal exchange rate and, ultimately, the ratio of nontradable to tradable goods prices in the foreign country relative to the same ratio in the home country. Thus:

$$q = \frac{EP^*}{P} = E\,\frac{P_T^*}{P_T} \times \frac{[\gamma + (1-\gamma)(P_N^*/P_T^*)^{(1-\theta)}]^{1/(1-\theta)}}{[\gamma + (1-\gamma)(P_N / P_T)^{(1-\theta)}]^{1/(1-\theta)}} \qquad (5A.1)$$

where E is the nominal exchange rate, P is price (the asterisk is for the foreign country and the absence of an asterisk refers to the home country), subscript T is the tradable sector, subscript N is the nontradable sector, θ is the elasticity of substitution, and γ is the share of tradables in consumption.[49] The term P_T^*/P_T reflects the terms of trade for traded goods.

49. The final ratio on the right hand side derives from the ratio of the two countries' consumer price indexes. For the home country, this index is:

$$P = [\gamma P_T^{(1-\theta)} + (1-\gamma)P_N^{(1-\theta)}]^{[1/(1-\theta)]}.$$

Now consider the impact of a demand shift sufficient to curb home demand for tradables by 20 percent. With $\theta = 1$, P_T/P_N must rise by 20 percent. In the foreign country, P_N^*/P_T^* rises by a smaller amount because of the larger size.[50] For its part, the term P_T^*/P_T will rise by an amount corresponding to a terms of trade loss of about 7 percent, when the elasticity of substitution between the foreign good and the home tradable (η) is 2. This turns out to mean that EP_T^*/P_T rises by 2.7 percent, using $\alpha = 0.7$ for the share of the home good in tradables.[51] So the real exchange rate rises (depreciates) from $q = 1$ to:[52] $q = 1.027 \times [(1.105)^{0.75} / [(0.802)^{0.75}] = 1.306$.[53] This real depreciation by about 31 percent (real loss of value by about 23 percent) can be carried out by a rise in the foreign price level, with a fixed exchange rate E; or by a rise in the nominal exchange rate E that is proportionate to the rise in the real exchange rate q with no rise in the foreign price level on average (and/or no decline in the average home price). The authors imply that with today's flexible exchange rates and the tendency of central banks to implement inflation targeting, the latter mode of adjustment would dominate.

Even when the authors apply optimistic substitution elasticities ($\theta = 2$, $\eta = 3$), the real exchange rate depreciates 15 percent, with alternative combinations yielding depreciations of 20 to 25 percent. Hence their central conclusion: the real depreciation of the dollar would need to be 20 percent to close the trade gap. They also cite an alternative figure of 40 percent, however, as ''a large potential overshoot in the event of a rapid reversal'' rather than gradual adjustment (Obstfeld and Rogoff 2004, 19).

Dividing the first and second terms of the bracketed expression by $P_T^{(1-\theta)}$ yields the form in equation 5A.1. Note further that when the elasticity of substitution is unity ($\theta = 1$), the constant elasticity of substitution (CES) form used by Obstfeld and Rogoff transforms into a Cobb-Douglas form (Henderson and Quandt 1971, 88). In this case, the final right-hand-side ratio in equation 5A.1 becomes: $[(P_N^*/P_T^*)^{1-\gamma}/(P_N/P_T)^{1-\gamma}]$.

50. Taking account of the various parameters, the mirror-image rise in the relative price of nontradables abroad works out to 10 percent.

51. Specifically: $E(P_T^*/P_T) = [\alpha\tau^{1-\eta} + (1-\alpha)]^{[1/(1-\eta)]}/[\alpha + (1-\alpha)\tau^{1-\eta}]^{[1/(1-\eta)]}$, where α is the weight of the home-produced tradable and $(1-\alpha)$ is the weight of the foreign tradable in tradable goods consumption, τ is the terms-of-trade ratio (price of foreign-produced tradable relative to home-produced tradable), and η is the elasticity of substitution between the home- and foreign-produced tradable goods.

52. The actual Obstfeld-Rogoff figure is 1.336, reflecting small differences in the approximation here. They call this a depreciation of 33.6 percent, which using their definition amounts to a loss of real value of 25.1 percent.

53. The implementation here of the Obstfeld-Rogoff model, using the ''goal-seek'' spreadsheet function to solve for τ, gives a slightly different estimate from the Obstfeld-Rogoff implementation. With $\theta = 1$ and $\eta = 2$, the estimate here is 30.6 percent depreciation, versus 33.6 percent in the Obstfeld-Rogoff results. With $\theta = 1$ and $\eta = 3$, the corresponding estimates are almost identical (25.3 and 25.4 percent, respectively).

Blanchard, Giavazzi, and Sa (2005)

A simplified version of the key exchange rate equation in Blanchard, Giavazzi, and Sa (2005) is

$$\partial E \,/\, \partial F = -\frac{\alpha + \alpha^* - 1}{(1 - \alpha^*)X^*} \tag{5A.2}$$

where E is the exchange rate (foreign currency units per dollar, normalized here to unity), F is net US external debt, α is the share of home assets in wealth, the asterisk denotes the foreign country, and X is the total stock of assets.[54] If there is no home bias, then $\alpha = \alpha^* = 0.5$ and the numerator on the right-hand side turns to zero. In a world with no home bias, a shift of wealth from the United States abroad has no consequences for the dollar because foreigners are just as happy to hold US assets as their home assets.

The authors instead place α at 77 percent portfolio share for home assets in the United States, and at $\alpha^* = 70$ percent abroad. This gives a value of 0.47 for the numerator of the right-hand side of equation 5A.2. They place X^* at about $35 trillion. The impact of a $1 trillion US current account deficit on the exchange rate will then be: $-0.47 \times \$1$ trillion/ $[0.3 \times \$35$ trillion$] = -0.045$. That is, a $1 trillion increase in net US external debt would induce a 4.5 percent depreciation of the dollar because of home bias. On this basis, the present pace of US current account deficits at about $750 billion annually would be expected to cause a 3.4 percent depreciation of the dollar (i.e., $= 0.75 \times 4.5\%$) annually, before taking account of foreign asset valuation and differential return considerations.

The dynamics of the system are driven by the fact that (i) a rise in F (net external debt) boosts interest payments, raising the current account deficit, and (ii) a rise in net external debt also induces a decline in the dollar, which improves the trade balance and reduces the current account deficit.[55] At the steady state equilibrium, demand and supply for US assets must be equal, and (in the no-growth version) the current account deficit

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54. In the full formulation, the portfolio shares α and α^* depend on the rates of return at home and abroad and on expected depreciation. In simplified form, the authors arrive at the equation for change in the exchange rate as follows. US net foreign debt equals US assets minus US wealth, and conversely, so:

1) $F = X - W = W^*/\,\mathrm{E} - X^*/E$, where W is wealth. Demand for US assets is:

2) $X = \alpha W + (1-\alpha^*)W^*/E = \alpha(X - F) + (1-\alpha^*)(X^*/E + F)$.

Holding US and foreign assets constant so that $\partial X = \partial X^* = 0$, it can be shown that:

3) $\partial E/\partial F = -[\alpha + \alpha^* - 1] \,/\, [(1-\alpha^*)X^*/E^2]$, which, for $E = 1$, becomes the text equation.

55. The stability condition, whereby an increase in net debt reduces the current account deficit, is that: $r/D_E < (\alpha + \alpha^* - 1)/\,[(1-\alpha^*)X^*/E^2]$, where D_E is derivative of the trade deficit with respect to the exchange rate and r is the return on assets (with $r = r^*$ for convenience in the dynamic analysis).

must be zero.[56] The authors consider two effects they believe characterize the US external accounts over the past decade: (1) an unexpected increase in the trade deficit from levels otherwise associated with activity levels and (2) an unexpected increase in foreign demand for US assets. The first leads to initial depreciation, followed by further anticipated depreciation; the second leads to initial appreciation, followed by anticipated depreciation.

Gourinchas and Rey (2005)

Gourinchas and Rey invoke the intertemporal budget constraint on the external deficit to arrive at the following key equation, estimated statistically:[57]

$$nxa = (x - \bar{x}) - 0.91(m - \bar{m}) + 0.79(a - \bar{a}) - .47(l - \bar{l}) \qquad (5A.3)$$
$$= -\sum_{j=1}^{\infty} \rho^j [r_{t+j} + \Delta nx_{t+j}]$$

where lower case refers to natural logarithm, X and M are quarterly exports and imports of goods and services, A is gross foreign assets, L is gross foreign liabilities, and the overbar represents the 1952–2004 mean. The term ρ is the ratio $(1 + r^*)/(1 + r)$ where r^* is the steady-state rate of return (equal for both assets and liabilities) and $r = w_a r^a + w_L r^L$, a weighted average of the return on assets and liabilities respectively. The term nx is the logarithm of exports minus the logarithm of imports. All underlying variables are in real per capita terms, deflating by producer prices for finished consumer goods and services (2000 = 100).

This measure is meant to capture the composite effect of the trade balance and portfolio earnings in meeting the intertemporal external balance constraint. The higher coefficient on assets than on liabilities reflects higher return on US foreign assets than liabilities. At the stationary ratios of exports, imports, assets, and liabilities to wealth, nxa should be zero. If $nxa > 0$, the exchange rate will appreciate and the trade balance decline, or the return on the net foreign asset position will decrease, or both; if $nxa < 0$, the currency will depreciate and the trade balance increase, or the return on the net foreign asset position will increase, or both.

Interpreting the Gourinchas-Rey analysis poses several difficulties. First, the analysis is relatively opaque. For example, as noted in the main

56. This requires, respectively, that: $X = \alpha(X-F) + (1-\alpha^*)[(X^*/E) + F]$; and $0 = rF + D(E)$.

57. With lower case italics representing logarithms, the authors regress x on m and leads and lags of Δm; a on l and Δl; and x on a and leads and lags of Δa (dynamic ordinary least squares). They combine the estimated coefficients with theoretically required weights for stationary ratios of exports, imports, assets, and liabilities to wealth to obtain equation 5A.3.

text, it is never clarified what the eventual level of net foreign liabilities is at the steady state.

Second, some of the underlying assumptions seem potentially contradictory. In particular, the framework requires that a steady-state net creditor run a trade deficit and a steady-state net debtor run a trade surplus. But the United States is a net debtor running a trade deficit, and it is unclear whether it is to transit somehow to net creditor status while continuing a trade deficit or to transit to net debtor running a trade surplus—in which case it should be made clear when and how the trade balance might be expected to swing into surplus (certainly the small depreciation mentioned in association with the imbalance would be insufficient to achieve this result).

Third, a glance at the ''estimating'' equation 5A.3 immediately shows that somehow the authors must regress their key variable on a set of data that does not exist: the entire future history of trade and asset earnings. They must use ''expected'' values as a proxy for this unknown future, but again, their method in identifying the right-hand-side measures for the statistical tests is complicated at best and arguably opaque.

Fourth, although the analysis is postulated in a framework of a ''stationary'' pattern for the ratios of assets, liabilities, exports, and imports to total household wealth, implicitly, the future paths are anything but stationary in the usual sense. They involve a secular deterioration in the US net foreign asset position. Although the resulting downward path may be stationary in the sense that observed fluctuations are stationary around it, it is unclear that this first-derivative stationarity is consistent with the underlying framework.

Understanding the Macro Model Simulations

In the basic fiscal impact analysis using the national income accounting identity (as set forth in chapter 4), the implicit assumption is that output is constant and a reduction in government spending reduces resource use and hence induces a reduction in the trade deficit. But macroeconomic models such as the FRB/Global (and even the simple general equilibrium model developed in appendix 4A of this study) instead allow response of output to the fiscal shock. Consider the implications for the trade balance. In difference form, the trade balance change from the national accounts identity becomes:

$$\Delta TB = \Delta X - \Delta M = \Delta Y - \Delta G - \Delta C - \Delta I \qquad (5A.4)$$

In the short term, and with a (neo-) Keynesian multiplier of close to unity,[58] a fiscal stimulus of dG will prompt a rise in output by $dY = dG$.

58. See, in particular, Blanchard and Perotti (2002).

If the model treats consumption and investment responses as sluggish, then in the short run, all that happens is that there is a boost in output that is identical to the increase in government spending, and nothing else changes.[59] There is no impact on the trade balance whatsoever.

Now consider the long run, which may be anywhere from three to five years and beyond. No reasonable macro model will allow long-run output to exceed capacity, so a fiscal stimulus will eventually have to be offset by reduced demand elsewhere in the system if the economy starts at full capacity. The Erceg, Guerrieri, and Gust (2005) model, as described in the main text of this chapter, suppresses demand back to capacity levels by strong negative feedback working through higher interest rates and a strong impact of the interest rate on investment and consumption. The model also suppresses consumption through Ricardian equivalence that directly offsets half of the fiscal shock as well as a fiscal reaction function, which means that the fiscal shock itself is eventually reversed. But the central question for the trade balance is whether this specification of the system's adjustment overstates adjustment of the domestic demand variables rather than the change in exports minus imports.

The long-run adjustment can be represented as follows:

$$\begin{aligned}\Delta(X - M) &= \Delta Y - \Delta G - \Delta I - \Delta C \\ &= 0 - \Delta G - (\partial I/\partial i)(\partial i/\partial Y)d\hat{Y} - (\partial C/\partial i)(\partial i/\partial Y)d\hat{Y} - (\partial C/\partial G)\Delta G\end{aligned} \tag{5A.5}$$

Here the interim increase in output above full capacity is represented as $d\hat{Y}$. This excess output induces the monetary authorities to raise interest rates (i) by the amount $(\partial i/\partial Y)d\hat{Y}$. This increase in interest rates then induces a decline in investment by the amount: $(\partial I/\partial i)(\partial i/\partial Y)d\hat{Y}$. Similarly, the rise in the interest rate induces a corresponding decline in consumption (fourth right-hand side term). Consumption also falls because of Ricardian equivalence (fifth right-hand side term). If the partial derivatives of investment and consumption with respect to the interest rate are large enough, and if the Ricardian reduction in consumption is large enough, then the entire right-hand side can go to zero and leave no room for change in the trade balance on the left-hand side. This same result can obtain with even smaller responsiveness to the interest rate and smaller Ricardian offset if there is a fiscal reaction function that squeezes down ΔG to well below its initial level.

Now suppose instead that the coefficients of investment and consumption on the interest rate, and the degree of Ricardian offset and fiscal reaction, are smaller. Consider furthermore the effect of the exchange rate (e) on exports and imports. Then we can write:

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59. That is, if $\Delta G = dG$ and $\Delta Y = \Delta G$ while $\Delta C = \Delta I = 0$, then equation 5A.4 becomes: $\Delta X - \Delta M = dG - dG = 0$.

$$\Delta X - \Delta M = (\partial X/\partial e)(\partial e/\partial i)(\partial i/\partial Y)(d\hat{Y}) \qquad (5A.6)$$
$$- (\partial M/\partial e)(\partial e/\partial i)(\partial i/\partial Y)(d\hat{Y}) = RHS$$

where *RHS* is the right-hand side of equation 5A.5. This time we specifically consider the impact of the exchange rate on exports and imports.[60] If the parameters for the partial derivatives of exports and imports with respect to the exchange rate are large enough, and if the derivative of the exchange rate with respect to the interest rate is large enough, the allocation of the adjustment back to capacity output will be distributed much more toward a decline in the trade balance rather than solely a decline in domestic demand. Neither the left-hand side (trade balance change) nor the right-hand side (domestic demand change) will be zero; instead, there will be a decline in the trade balance in addition to the decline in domestic demand for consumption and investment.

60. No income effect on imports is included because in the long-run version income must return to the original level.