3

International Capital Flows and the Sustainability of the US Current Account Deficit

CATHERINE L. MANN

The relationship between international capital flows and the sustainability of the US current account deficit can be viewed from two perspectives: (1) the US ability to repay and (2) the foreign willingness to buy US assets.

From the US perspective, financial sustainability is the cost of and ability (and desire) to make good on previously incurred liabilities—that is, given the magnitude and composition of US liabilities on the one hand and the US holdings of foreign assets on the other, how large is the ensuing net claim on US resources? Once that claim gets "too large," the ability or willingness of the United States to repay is called into question, and international capital will not continue to flow to the United States to finance the current account deficit. At that point, the US current account deficit has, by definition, become financially unsustainable.

"Too large" has both stock and flow dimensions. The stock dimension can be measured as the stock of liabilities as a share of GDP or of wealth, for example. The flow dimension can be measured as interest payments as a share of national income or as a share of exports, for example. An intermediate measure, contributing to both stock and flow dimensions, is the current account as a share of GDP. "Too large" by one dimension need not imply "too large" by another dimension, which makes it difficult to use data to determine the sustainable external position from the US perspective.

From the foreign perspective, financial sustainability is the rate of return on and desire to buy additional claims on the United States—that

Catherine L. Mann, senior fellow at the Peterson Institute for International Economics since 1997, is a professor of economics at Brandeis University.

is, given the magnitude and composition of the foreign wealth portfolio, does the foreign investor want to continue to buy equity, bonds, and ownership positions in US corporations? If the foreign investor is unwilling to continue to purchase US assets at current terms (including interest rate and exchange value), then the US current account deficit has, by definition, become financially unsustainable.

For the foreign perspective too, financial sustainability has both stock and flow dimensions. The stock dimension can be measured as the share of US assets in the value of the overall foreign portfolio of wealth. The flow dimension can be measured as the purchase of US assets as a share of the change in the value of foreign wealth, for example. Once again, sustainability as measured by stock versus flow could differ, which makes it difficult to use data to define sustainable international capital flows from the foreign perspective.

Of course, these two perspectives, and the measures of sustainability, are related. If the foreign investor calculates that the United States is less willing or able to make good on (that is, repay) previously incurred liabilities, that foreign investor is unlikely to buy more US assets (indeed perhaps will sell some) and may demand a risk premium on new claims. This risk premium makes it more costly for the United States to make good on its obligations. The presence of a risk premium in the data could be another indicator of financial unsustainability.

On the other hand, if the foreign investor does choose to sell US assets, the dollar may depreciate. To the extent that US assets held by foreigners are denominated in dollars, this depreciation represents a capital loss to the foreign investor (and a capital gain for the United States), which, along with the real effects of a dollar depreciation on trade flows, potentially enhances the ability of the United States to repay the remaining outstanding obligations. So a rapid depreciation of the dollar could be another indicator of financial unsustainability in the immediate term yet promote financial sustainability in the long term.

This short overview of international financial theory points to several analytical propositions and measures (e.g., benchmarks or thresholds) with regard to the sustainability of the current account deficit. Important benchmarks to assess sustainability might be the magnitude of obligations, the net financial cost of obligations, and the average and marginal shares of US assets in the foreign investor's portfolio of wealth. Evidence of a risk premium on new claims on US assets after a rapid run-up in foreign holdings may indicate future unsustainable financing of the current account deficit. More broadly, changes in asset prices (interest rates, equity prices, and exchange value of the dollar) are ways to gauge changes in the equilibrium between US ability to make good on international obligations and foreign desire to buy US assets.

Research on the sustainability issue addresses two questions. First, are there systematic patterns in the historical data that define benchmarks or

thresholds for when the external imbalance is financially unsustainable? Second, which blade of the scissors—US ability to repay or foreign willingness to buy—is likely to do the cutting?

US Ability to Repay

The US current account deficit of the last 25 years has accumulated to a negative net international investment position (NIIP), on which, presumably ultimately, the country will make net investment income (NII) payments. As is well known, the NII stream remains positive (at least as revised)[1] despite the negative $2.4 trillion NIIP as of 2007. The magnitude of the NIIP as a share of GDP and the magnitude of the NII stream as a share of GDP are often seen as relevant parameters when considering the sustainability of the current account deficit.[2]

Numerical benchmarks for sustainability, however, are less obvious. Based on past experience of industrial countries with regard to when current account adjustment takes place, the NIIP/GDP ratio can range from –40 percent to +10 percent around the time of adjustment. Similarly, for the flow, NII/GDP can range from –10 percent to +1 percent around the time of current account adjustment (Bertaut, Kamin, and Thomas 2008, exhibits 7a and 7b). These very wide ranges (even the sign is not consistent) suggest that little information about sustainability thresholds can be gleaned from numerical benchmarks defined by NIIP/GDP or NII/GDP.

More consistent experience surrounds the intermediate measure of the current account as a share of GDP. Research in Mann (1999, 156) and Freund and Warnock (2007) among others implies that a current account deficit of around 4 to 5 percent of GDP for industrial countries is, on average, associated with an onset of currency depreciation and slower GDP growth, both of which tend to ameliorate the external imbalance. Therefore, the current account threshold appears to be the more stable of the measures of financial unsustainability.

Theory says that there should be a clear relationship between the current account and the NIIP, so why does this not play out in terms of empirical analysis? For the United States, there are two well-researched "mysteries" about the relationships between the current account, the NIIP, and NII streams. Looking into these mysteries helps inform as to why neither the NIIP nor the NII is a good indicator of external sustainability.

---

1. Initial data for NII have come in negative several times over the last five or so years but have always been revised positive.

2. Bertaut, Kamin, and Thomas (2008) emphasize that a technically more correct perspective (in that it matches a stock to a stock) is NIIP/total wealth. This is not the most commonly used benchmark, in part, no doubt, because of difficulties measuring and projecting total wealth. I take on this task for foreign wealth in the third section of this chapter.

First, the accumulation of past US current accounts does not sum to the net international investment position; in fact, valuation effects on the stock of assets and liabilities are quite significant so that the NIIP is much less than the sum of past current account deficits. The two panels of figure 3.1 show the magnitude and decomposition of the valuation effects for two periods—2002–04 and 2002–06—as of those periods (i.e., without subsequent data revisions). During this whole period, the real exchange value of the dollar was depreciating, which would tend to depress the value of US net liabilities. However, in addition to valuation effects from currency depreciation, those from differential asset prices and "other valuation" effects are important and in fact can dominate, as in the latter period. For the purposes of projecting sustainability of the US external imbalances based on the NIIP/GDP concept, a key challenge will be to project valuation effects.

Second, there are persistent differentials in the rate of return that the United States earns on its assets abroad compared with the return that foreigners earn on their assets in the United States (figure 3.2). The most important component of this differential relates to returns on foreign direct investment (FDI), where the United States has earned substantially more on its FDI abroad than foreigners have on their FDI in the United States. The rates of return on other US assets abroad exceed the rates of return earned by foreigners on their portfolio of US assets, but not by much. The rates of return on these other assets follow rather closely the US Treasury rate. In the course of projecting sustainability of the US external imbalances based on the NII/GDP concept, it will be necessary to project rate of return differentials—both for FDI and for other assets.

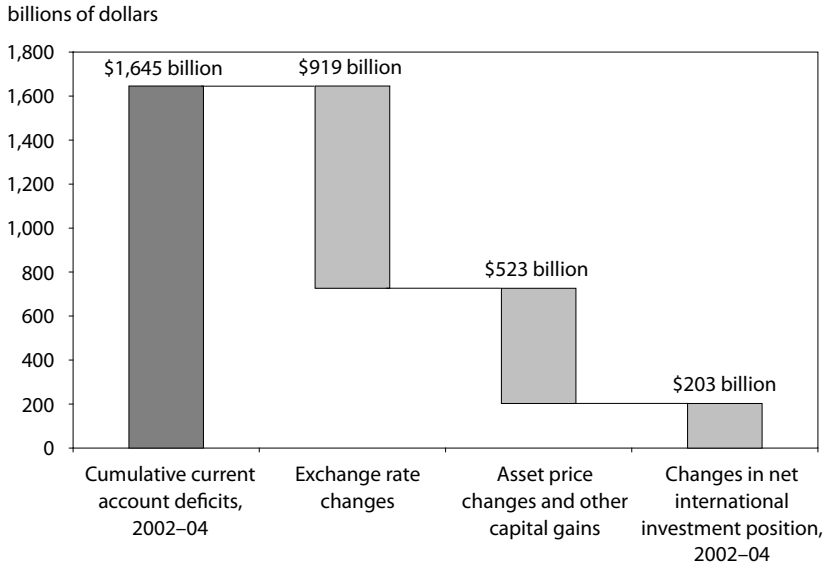
In sum, understanding the source and likely persistence of these two mysteries—the valuation effects and the favorable relative return on US FDI abroad—is key to any projection of NIIP and NII and the benchmark concepts based on them. In addition, the gross flows of assets and liabilities that underpin the net position and income streams are crucial for the second main perspective on sustainability, that of projecting foreign willingness to buy.

Measurement of the NIIP and Rates of Return

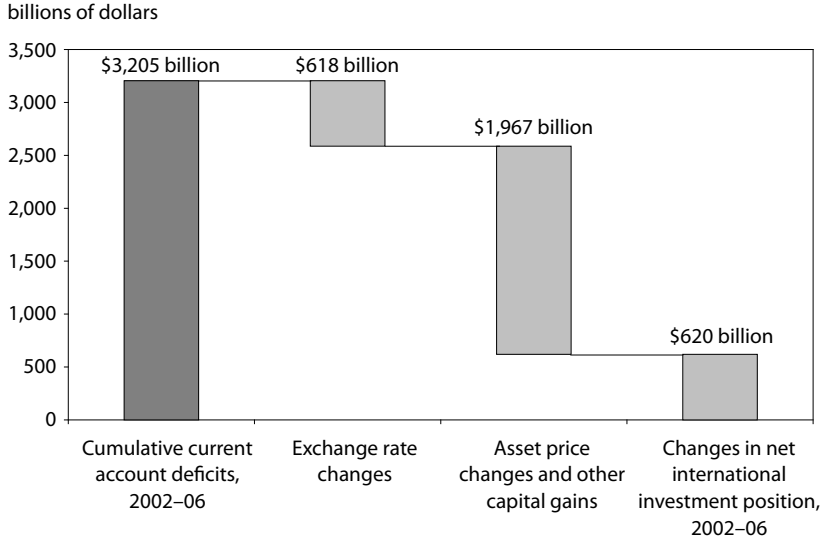
The mysteries associated with the US NIIP and NII have not gone unresearched. Advances in available data have spawned a burgeoning recent literature on measurement and valuation of assets and liabilities. This literature is crucial to evaluating whether the accumulated current account deficit yields a "too large" net international investment position, which the United States must ultimately service using financial and real resources. A few key examples from the literature and their implications for projections of the current account, NIIP, and NII are noted below. In sum, uncertainties with regard to valuation effects on the net international investment

Figure 3.1 Valuation changes in the US net international investment position, 2002–06

a. 2002 to 2004 (as of 2005)



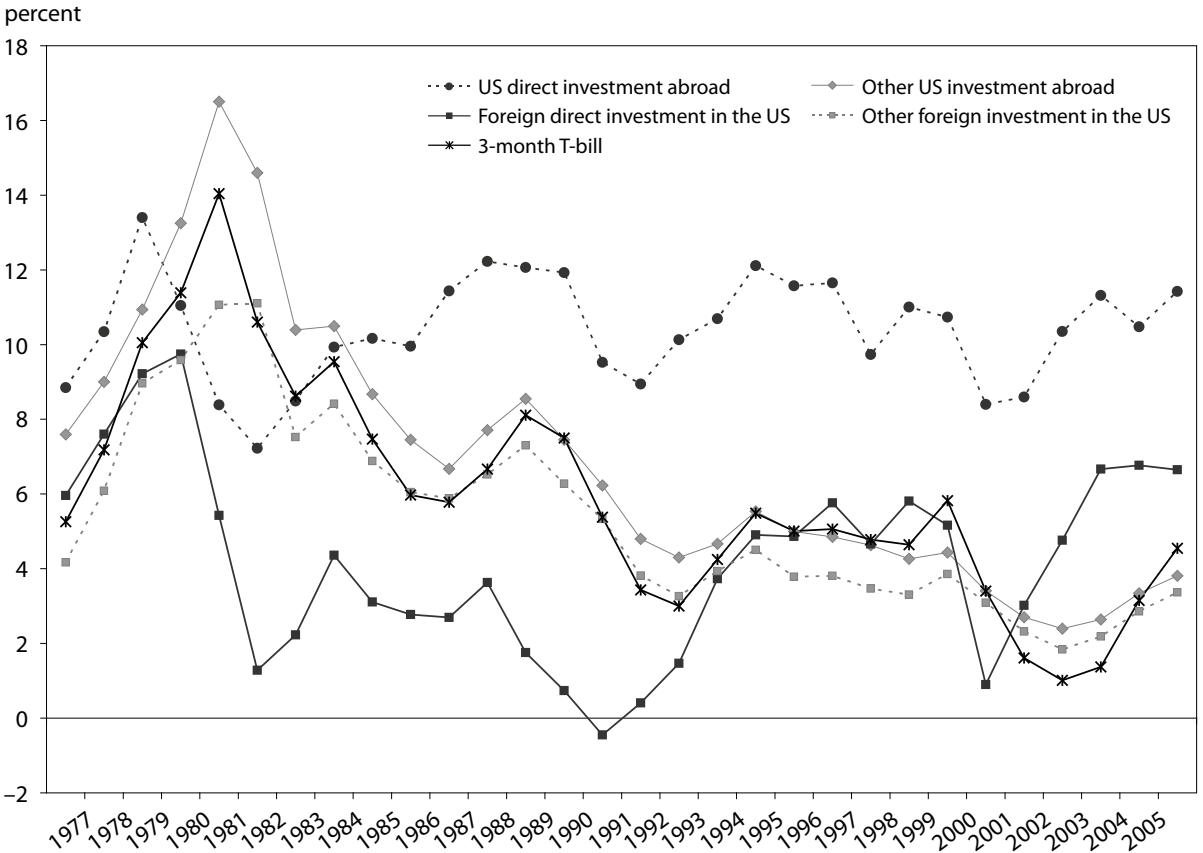
b. 2002 to 2006 (as of 2007)



Note: Exchange rate valuation changes in 2005 came to negative $227 billion.

Source: Bureau of Economic Analysis.

Figure 3.2 Implied rates of return on US assets and liabilities, 1977–2005



Sources: Bureau of Economic Analysis; Federal Reserve Board.

position and on rates of return on assets and liabilities make projections of the future US ability to repay quite speculative.

The first issue is valuation effects. Phillip Lane and Gian Milesi-Ferretti (2007) analyze global current account and asset position data from the International Monetary Fund's coordinated survey on "external wealth of nations." They emphasize the importance of valuation effects, composed of both changes in the exchange value of the dollar and relative (US versus foreign) equity market performance. Considering just their results for the United States over the floating rate period, the relative importance of capital gains/losses due to exchange rates versus equity markets varies: Sometimes dollar valuation dominates and sometimes equity market valuation dominates. This observation can be gleaned from figure 3.1 for 2002–06.

Another analysis of the valuation effects (Curcuru, Thomas, and Warnock 2008) decomposes the valuation effects into exchange rates, return differentials, and "other," noting that the last is very large (as is also observed in figure 3.1). The authors speculate about the origin of this "other" component and wonder about its likely persistence.

Based on this research, a projection scenario cannot assume a strong or consistent relationship between dollar depreciation and valuation changes in the NIIP. First, at times, other valuation changes, including asset price differentials, swamp the effect of the dollar alone, and second, the magnitude of the currency valuation effect is not systematically related to foreign exchange movements.

The second issue is rate-of-return differentials that favor the US investor. Pierre-Olivier Gourinchas and Hélène Rey (2007) focus on the differentials in rates of return earned on US assets versus paid out on US liabilities. They develop their own dataset that generates the net international investment position "from the ground up" by recalculating gross asset and liability positions and then applying valuation adjustments to each type of financial asset. They find that the United States enjoys a net premium on its assets, which is composed of a return effect (higher returns on assets versus liabilities of similar characteristics) and a composition effect (the United States holds a riskier and therefore higher-return set of foreign financial instruments as assets compared with its liabilities, e.g., the types of US financial instruments that foreigners hold). Reduction of US home bias (i.e., preference for owning home assets), such that the US portfolio includes more foreign equity assets that have yielded a higher return, also contributes to the return premium enjoyed by US asset holders.

Differentials in the rates of return on FDI are the most important determinant of the overall return premium, as noted in figure 3.2. With regard to these return differentials, several analysts (e.g., Mann and Plück 2006, Kitchen 2007, and Higgins, Klitgaard, and Tille 2006) have documented persistent excess returns on US FDI assets relative to foreign FDI in the United States, although Katharina Plück and I (Mann and Plück 2006)

note that it appears that the return differential in favor of US FDI abroad may be narrowing somewhat. The fundamentals underlying this persistent gap are not known, despite research that goes back several decades. Suggestions range from higher-quality US management to age of assets to tax differentials. Carol Bertaut, Steve Kamin, and Charles Thomas (2008) do note, however, that this asymmetry—that FDI abroad earns more than FDI in the home country—is observed for all industrial countries.

Stephanie Curcuru, Charles Thomas, and Frank Warnock (2008) analyze the non-FDI part of the return differential. They maintain, in contrast to Gourinchas and Rey (2007), that the return differentials are small. In examining the return differentials more closely, Curcuru, Tomas Dvorak, and Warnock (2007) generate their own data on portfolio debt and equity investments of US investors abroad and foreign investors in the United States based on the Treasury International Capital reporting system and benchmark surveys of holdings. They calculate that a key reason for the favorable return differential on non-FDI assets is unfavorable foreign "timing," for example, foreign investors tend to sell assets into an unfavorable market, thus worsening their holding return on US assets.

Collectively, these analyses (and simple examination of the data for the last six years) point to severe challenges to projecting the path of NIIP and NII forward. Assumptions must be made with regard to the future path of valuation effects, which are crucial to the sustainability question. Second, whereas it is common to make assumptions regarding the path for the dollar and interest rates, these analyses make clear that projections must also make assumptions on relative equity market performance and foreign investor behavior—far more difficult propositions—and also must pass judgment on "other" valuation effects and any changes in home bias. Finally, the assumption that the FDI gap will persist is crucial to the conclusion that net investment income on the net international investment position will remain small (or even positive). All these factors impact valuation effects and return differentials, which make or break conclusions with regard to the size of the NIIP, the magnitude of net investment income, and therefore the sustainability of the US current account deficit as judged from the US perspective.

Projections of US Ability to Repay

Proceeding despite the valuation and rate-of-return challenges, many who engage in a projection exercise conclude that it will be many years before the criteria of "ability to repay" is breached; in fact, sustainability probably would turn more on "willingness" to forgo domestic consumption and investment in order to service the NIIP. I reached the same conclusion in Mann (2003). Of course, each of these exercises differs somewhat. A brief summary of selected projection exercises is reported here.

The most recent scenario is by Bertaut, Kamin, and Thomas (2008),

who project a negative NIIP/GDP of about 65 percent by 2020; but net investment income payment would account for only about 0.5 percent of GDP as the return differential on FDI is assumed to remain large. Similarly, John Kitchen (2007) projects NIIP/GDP rising to 39 percent of GDP with net investment income payment rising to just about 0.75 percent of GDP by the end of his projection horizon in 2016. In addition to his own scenarios, Kitchen (2007) reports on and reproduces scenarios from Higgins, Klitgaard, and Tille (2005), Cline (2005), and Roubini and Setser (2004).

As an example of the importance of assumptions regarding valuation effects and the assumption of persistently higher rates of return on US FDI abroad, Kitchen (2007) reports on exercises using the Roubini and Setser (2004) base case, which assumes that rates of return on foreign-owned assets exceed those on US-owned assets (which is opposite to historical norm) and makes no valuation adjustments (which is quite contrary to historical experience). In the Roubini-Setser "counter-to-historical-norms" projection, the negative NIIP/GDP ratio rises to more than 100 percent of GDP and the net investment income payment reaches about 6 percent of GDP. NIIP/GDP of 100 percent is well outside the bounds of industrial-country experience prior to current account adjustment. Paying 6 percent of GDP to service this negative NIIP implies draconian cuts in US domestic consumption and investment. Presumably the US ability to pay would be questioned and the external imbalance deemed financially (not to mention politically) unsustainable well before the end of their projection horizon in 2020.

However, as Kitchen notes in his version of the Roubini-Setser exercise, if the historical norm of higher US returns on FDI is applied and valuation effects consistent with historical norms are considered, the Roubini-Setser scenario plays out much the same as for the other analysts, with negative NIIP/GDP about 70 percent and net investment income payment about 2 percent of GDP by the end of the projection period.

Finally, Kitchen (2007) runs his own plausible scenario whereby the most questionable valuation effect (the "other" component) is set to zero and the FDI premium erodes to zero. In this case, NIIP/GDP reaches about 60 percent and the NII/GDP is –2.3 percent. These two comparative scenarios show the importance of these two key assumptions of FDI rates of return and valuation effects. Whereas both are important, the valuation effects appear to be the relatively more important factor that keeps the NIIP from getting "too large."

In conclusion, if valuation effects and the FDI premium are observed in the future as they have been in the past, the US-centric "ability to pay" criterion for sustainability is not likely to be the cutting blade of the scissors of sustainability. NIIP/GDP is not so large, and NII/GDP remains less than 1 percent. However, if valuation effects diminish and the FDI premium erodes, then the ability to repay hinges more on the willingness

of US citizens to reduce consumption, investment, or government spending by 2 to 3 percent of GDP. While not large percentages on an individual basis, on an economywide basis these figures loom rather large given that an increase in household savings of 3 to 4 percent (just to repay international obligations) may be associated with recession[3] and/or an 11 to 17 percent shift in government spending (which is the equivalent of how much would have to be paid to foreign investors) is not in the recent US historical experience.[4]

Foreign Desire to Buy

The financing of the US current account deficit of the last 25 years, as well as the financial choices of private investors, have accumulated into the wealth portfolios of foreign investors (both private and official, inclusive of reserves, government-owned or -controlled corporations—e.g., sovereign wealth funds). So the second perspective on international capital flows as it relates to US current account sustainability is that of the global investor.

A simple overview of the international portfolio model of current account sustainability is in Mann (2002), although the underpinnings go back at least to Henderson and Rogoff (1982). How much the global investor is willing to invest in US assets is a function of the risk-return profile of the US obligations relative to financial assets of other countries, the investor's attitude toward risk and desire to diversify investments, and the overall size of the wealth portfolio.

Relatively higher rates of return or relatively lower risk are obvious determinants of portfolio choice. However, the growth of the investor's home economy, the size of his or her global portfolio, and the available supply of alternative foreign investments also are important in determining how many US assets the foreign investor might want.

Moreover, risk matters: If the variability of the rate of return on an asset increases—because of variability in interest rates, inflation rates, or exchange rates—investment in that asset generally declines, or else the asset must yield a higher return to compensate the holder for that greater risk.

There are two potential benchmarks of interest when considering the financial sustainability of the US external deficit: average and marginal. The current (i.e., average) share of US assets in the global investor's portfolio of assets is the more common measure. But the marginal investment in US assets that the global investor must make with each currency-unit increase

3. As indeed appears to be the case as of April 2009.

4. The increase in household savings is calculated as 2 to 3 percent times 70 percent share of consumption in GDP. The increase in the budget position is calculated as 2 to 3 percent times 17 percent share of government spending in GDP and about 50 percent share of US Treasury securities held abroad.

in wealth in order for the United States to be able to finance its ongoing current account deficit may be more important.

Key factors underpinning the global investor's choices, and therefore the desire to invest in US assets, include the overall magnitude of global wealth, its increase in size (both directly through fundamentals of GDP growth and national savings and indirectly through changes in financial leverage[5]), and any changes in investor home bias (whether by evolutionary changes in preferences or through direct changes in regulations). Clearly, it will be difficult to tie down these parameters in the context of a projection of US current account sustainability that just focuses on the United States from a stock or flow standpoint. A key challenge for this perspective on sustainability is evaluating these parameters of the foreign investor's wealth portfolio.

Size and Composition of the Foreign Portfolio

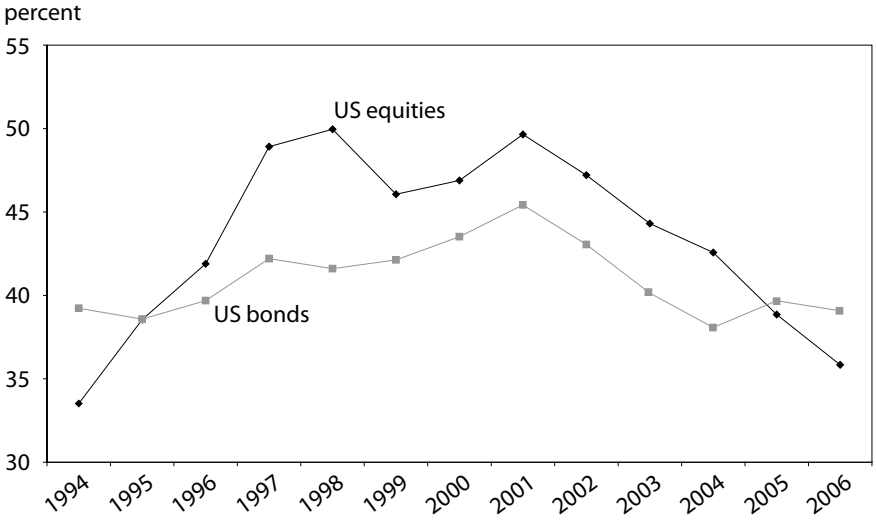
Recent research has focused on documenting the historical pattern of the share of US assets in the foreign portfolio of wealth. Home bias has been the focal point of this literature. That is, it is difficult to judge whether the US share of foreign portfolios is "too high," which might precipitate an asset sale, if we don't know what the current share is or how it has changed over time.

Lane and Milesi-Ferretti (2007), using their global financial data, measure and evaluate the share of US assets in the portfolio of global wealth. They suggest that the US share in terms of total liabilities peaked around 1999 and then fell to 2004, when their research window ends. The drop in the US equity and FDI share was particularly pronounced and accounts for the bulk of the decline in the US share in the asset holding of the global portfolio of wealth. Figure 3.3 reproduces Bertaut, Kamin, and Thomas (2008, exhibit 8), which reports that that US share in world equity market capitalization rose from about 35 percent in 1994 to about 50 percent between 1998 and 2001, before falling back to 35 percent in 2006. More modest trends, but with the same general features, are observed in the share of US bonds in world market capitalization. These observations using more recent and comprehensive data are consistent with those I reported in Mann (2003) and Mann and Plück (2006).[6] In sum, the data suggest that the US share of the global investor's portfolio now is smaller than it has been in the past, which implies that there is "room" in the portfolio for more US assets; the question then becomes, at what terms (e.g., interest rate and exchange value)?

5. Financial leverage is the relationship between holdings of financial assets and GDP.

6. In Mann (2003) I used the *Economist* magazine's portfolio poll, a survey of global portfolio managers, and financial data from the OECD, which were the available sources at that time.

Figure 3.3 Share of US assets in world market capitalization, 1994–2006



Source: Bertaut, Kamin, and Thomas (2008).

Just because the global investor is buying more foreign assets in general does not necessarily mean that he is favoring US assets. Bertaut, Kamin, and Thomas (2008) delve into their data to investigate these issues of home bias and the relative demand for US assets versus other foreign assets when the global investor chooses to buy nondomestic assets. Using the IMF's coordinated portfolio survey data and national balance sheets, Bertaut, Kamin, and Thomas calculate the US share in the global investor's[7] total wealth portfolios (including both home and nondomestic assets) and then the US share of the nondomestic portion of the global investor's portfolio.

The home bias of the global investor's equity portfolio (e.g., the share of the equity portfolio that is domestic assets) fell from about 85 percent in 1997 to 75 percent in 2006. During that period, the US share of the total portfolio rose from about 6 to 7 percent. With respect to the global investor's bond portfolio, the home bias fell from about 77 percent in 1997 to about 70 percent in 2006. During that period, the US share of the bond portfolio rose from about 6 to about 11 percent (Bertaut, Kamin, and Thomas 2008, exhibit 9). So exposure to US assets definitely increased as part of the foreign financing of the US current account deficit.

7. The data are calculated excluding the US investor. The term "global investor" is used here to mean non-US global investor.

However, when Bertaut, Kamin, and Thomas look at the *US share of the nondomestic* portion of the global investor's portfolio, they find that the US share of nondomestic equities *fell* from 36 percent in 1997 to 30 percent in 2006. The US share of nondomestic bonds rose from 25 percent in 1997 to 38 percent in 2001, where it has remained (Bertaut, Kamin, and Thomas 2008, exhibit 10). These calculations indicate that the global investor is indeed displaying modestly lower home bias for both equity and bonds, which implies a greater *ability* to purchase US assets.

But in fact this trend toward purchasing a greater fraction of nondomestic assets has not been biased toward buying US assets. Does this imply that the global investor is starting to shy away from US assets? It could be so, in that it appears that the global investor has an even greater appetite for non-US assets when he or she invests outside his or her home market. However, it could also be the case that dollar depreciation reduces the value of the dollar component of nondomestic assets while increasing the foreign-currency value of non-US, nondomestic assets. Therefore, it is difficult to tell whether what we observe is a revealed preference for non-US foreign assets or the simple algebra of how exchange rate valuation affects the share of US assets in the global investor's nondomestic portfolio.

Another gauge that foreign investor interest in US assets may have topped out is to look for evidence of a risk premium on US assets following a run-up in foreign purchases. The Curcuru, Dvorak, and Warnock (2007) story of unfavorable timing is not consistent with the story of a risk premium on US assets that develops after substantial increases in holdings of US assets by foreign investors. Moreover, using different data and methods, Bertaut, Kamin, and Thomas (2008) also find little evidence that US interest rates are systematically related to foreign holdings of US assets.[8]

A further gauge that foreign investor interest in US assets might have waned is to look at the composition of foreign assets in the global investor's portfolio: Who is buying those assets, at what price, and what kind of assets? As noted by Lane and Milesi-Ferretti (2007), and Mann and Plück (2006), as well as others, a decomposition of US capital inflows (e.g., foreign purchase of US assets) reveals a movement toward bank debt and foreign official purchases, rather than foreign purchases of equities and bonds. This does suggest that foreign *private* investors have sufficient exposure to the United States in their portfolios and may not want much more at current interest rates and exchange rates.

Finally, as discussed in Mann (2002) and Truman (2005), a depreciating dollar (as one measure of the price of US assets) may be evidence that foreign investors collectively have become sated. That is, a sated foreign investor will not buy any more US assets, which nevertheless are being

8. Thus, Cline's assumption (in chapter 2) that a higher NIIP generates a higher interest rate is not consistent with the research findings by these other analysts.

offered, net, into the market via the current account deficit. Under these circumstances of excess supply of US assets, the dollar would tend to depreciate. However, in regression analysis, Bertaut, Kamin, and Thomas (2008) find no evidence of a relationship between the size of the NIIP and the dollar (as neither did Gagnon 1996). On the other hand, episodes of adjustment of large current account deficits are usually associated with currency depreciation, as noted in Freund and Warnock (2007) and Mann (1999).

All told, from the standpoint of sustainability research relevant for projections, this body of analysis points out the challenges of projecting both the level and any change in the desire of foreigners to continue to buy US assets and the type of assets. At a minimum, such projections need to consider the future path of a global investor's home bias as well as financial leverage, along with projections of the growth in the overall size of the global investor's portfolio of wealth.

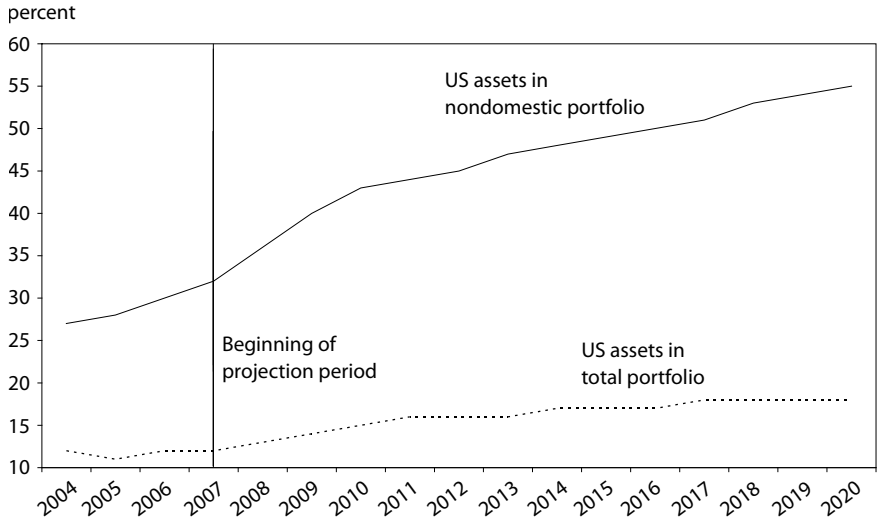
Projections of the Foreign Willingness to Buy

Facing challenges of raw data and speculative assumptions on home bias and financial leverage (the relationship between financial wealth and GDP), few researchers hazard to project the US share in foreign portfolios, which in fact demands making all the assumptions made in the previous section ("ability to repay") to project the "supply" of US assets to the international capital market. Then, all the caveats of the research outlined above must also be addressed so as to project the size of the global investor's portfolio.

Forging ahead nevertheless, in Mann (2003) I used a simple model of the US current account to project the net "supply" of US assets to the global investor. I calculated historical and projected non-US global wealth based on OECD data, assuming unchanging financial leverage, and experimented with various home bias ratios to project a non-US global investor's wealth portfolio. What did the ratio of the net supply of US assets to this global portfolio of wealth reveal when the initial exercise was undertaken in 2001?

Without any change in the value of the dollar (as of 2001) those calculations revealed that more than 100 percent of the *increase* in the global investor's portfolio would have to have been allocated to US assets. This calculation is with regard to the *marginal* investment by the global investor, not the average share of US assets in the global investor's portfolio of wealth. The calculation of the marginal investment in excess of 100 percent strongly suggested a "too high" increase in the supply of US assets relative to the increase in the global investors' portfolio. Thus, the foreign "willingness to buy" was the blade of the scissors that cut in 2001, and the dollar depreciated as foreign investors chose not to allocate more than 100 percent of the increase in their wealth to the US assets that were being offered.

Figure 3.4 Projected share of US assets in global investor portfolio, 2004–20



Source: Bertaut, Kamin, and Thomas (2008).

Since 2001, new data have become available on foreign investment portfolios. Bertaut, Kamin, and Thomas (2008) engage in an exercise similar to mine but using these new data. Even with better raw data, they still need to make important assumptions about financial deepening (they assume an unchanged ratio of GDP to market capitalization) and about the composition of the global investor's portfolio (they assume that the bond and equity shares are unchanged from 2007 shares).

Based on their assumptions and their model of the US current account, the US share in the global investor's portfolio would rise from between 7 percent (for equities) and 11 percent (for bonds) to about 20 percent by 2020. The US share of the nondomestic part of the global investor's portfolio would increase from about 30 percent to about 55 to 60 percent (Bertaut, Kamin, and Thomas 2008, exhibit 12).

The Bertaut, Kamin, and Thomas method is more sophisticated than mine, but the spirit is quite the same. However, they reach a somewhat different conclusion than I did about sustainability based on foreign willingness to buy. They focus on the *average* share of US assets in the portfolio and conclude that, whereas the increase in US share of the global investor's wealth portfolio is large, even with this increase, the foreign investor would remain underweight US assets compared with global market capitalization. Inspection of their results (presented in figure 3.4) suggests an inflection point with a significant rise in the average share of US assets in

the global investor's portfolio in the first years of the projection. Thus, it is possible that the *marginal* demand[9] on the value of the global investor's portfolio, particularly its nondomestic portion, could be "too large."

Research on future sustainability from the perspective of the global investor's "willingness to buy" gives mixed conclusions. Under some scenarios, it appears that this blade of the scissors might be the one that cuts and that precipitates changes in asset prices, particularly the exchange value of the dollar. However, other scenarios are not so clear and suggest that even by this financial criterion, the US trajectory of global imbalances remains sustainable.

The Global Investor and Financing the US Current Account: New Projections

Based on most of the previous research, it appears that a fresh examination of sustainability of the US external balances based on "foreign willingness to buy" may be fruitful. Accordingly, this section first details how I construct the global investor's portfolio and then examines the relationship between the projections of the global investor's portfolio and the financing of the US external deficit under alternative scenarios for the US current account and gross flows of assets and liabilities drawn from chapter 2 by William R. Cline in this Special Report.[10]

Constructing Projections of the Global Investor's Portfolio

We must start with a projection of the global investor's portfolio, which will be the denominator of the calculation of the share of US assets in that portfolio. Building the global investor's portfolio starts with the historical data constructed by Bertaut, Kamin, and Thomas (2008). These data are more up-to-date, are more inclusive of asset types, and cover more countries than the OECD data I used in Mann (2003). The data available include the global investor's equity portfolio, his or her bond portfolio, and the nondomestic share of each. Using these data one can construct "financial leverage" (total portfolio/GDP, bond/GDP, equity/GDP) and also consider "home bias" (nondomestic share/total portfolio, by equity or bond type). Changes in financial leverage and home bias could be important factors underpinning sustainability because both affect the magnitude of the global investor's portfolio of wealth.

9. By marginal demand, the calculation is the change in US assets offered relative to the change in size of global investor portfolio.

10. The projections for the US current account derive from the Cline baseline as of November 2008. He subsequently revised the baselines in light of the larger projected fiscal deficits on account of both the stimulus package and the recession (see chapter 2).

Table 3.1 The global investor's portfolio, 2006

Portfolio	Bertaut, Kamin, and Thomas (2008) (trillions of dollars)	Home bias (percent)	US assets held abroad, Bureau of Economic Analysis (trillions of dollars)
Total portfolio	57.60		
Equity	26.80	75.7	
Domestic	20.30		
Nondomestic	6.50		
of which: United States	1.97		2.55
Bonds	30.76	69.4	
Domestic	21.36		
Nondomestic	9.40		
of which: United States	3.45		5.56

Sources: Bertaut, Kamin, and Thomas (2008); Bureau of Economic Analysis, U.S. Net International Investment Position at Yearend 2007, table 1 on International Investment Position of the United States at Yearend, 2006 and 2007 (line 39 for equity and lines 28, 36, and 38 for bonds); author's calculations.

According to Bertaut, Kamin, and Thomas (2008), the global investor's portfolio was valued at about $57 trillion in 2006 (table 3.1). Non-US GDP was about $35 trillion. Thus financial leverage was about 1.6. In comparison, using a completely different dataset, in Mann (2003) I calculated global financial leverage at 1.7 in 2001 and 1.88 if only the OECD countries were considered. With the broader country group included in the Bertaut, Kamin, and Thomas data, the financial leverage ratio they calculate of 1.6 is probably about right. If the portfolio is decomposed into equity and bonds, the equity financial leverage is around 0.75 and the bond financial leverage is about 0.85.

With financial deepening around the globe, financial leverage in individual countries, and accordingly for the world, might be expected to rise. For example, Bertaut, Kamin, and Thomas's data suggest that financial leverage, as defined here, rose from 1.57 in 2004 to 1.68 in 2006. On the other hand, dramatic upheavals in the financial markets in 2007 and particularly 2008 might cause financial leverage to fall, as consumers keep more of their funds in simple deposit environments rather than equities and bonds. Therefore, changes in financial leverage could change the size of the global investor's wealth portfolio that could be allocated to US assets.

The data from Bertaut, Kamin, and Thomas (2008) also allow calculation of a bond and equity home bias. The home bias is about 0.75 for equity and 0.70 for bonds. I generated about the same home bias for

2001 in Mann (2003). The data for 2004 to 2006 indicate that home bias has been decreasing modestly for both equity and bonds. (As noted, however, just because home bias falls does not guarantee that more US assets are purchased, but it does allow for a greater potential for US assets to be added to the global investor's portfolio. That is, lower home bias points to a larger amount of investable wealth directed toward nondomestic assets, some of which can be US assets.) Table 3.1 shows the decomposition of the global investor's portfolio according to the Bertaut, Kamin, and Thomas data, by domestic and nondomestic assets, including US assets.

Whereas home bias has generally been falling, the share of US assets in the global investor's portfolio, as noted in the previous section, has remained stable (bonds) or fallen (equity). Financial upheaval might lead to a retrenchment toward domestic assets, perhaps reducing the share of the global investor's pie that would be available to purchase US assets. Conversely, financial upheaval could lead to flight to quality international assets, which historically at least have been US assets (and indeed this has been the case as the financial crisis unfolded in September 2008). Thus both home bias and the share of US assets in the portfolio could change over time.

Reconciling Financial Data for the Base Period

The scenarios of how the share of US assets in the global portfolio of wealth might change require projecting both the "numerator" (US assets sold abroad) and a "denominator" (the global investor's portfolio). The numerator of the calculation is based on the November 2008 projections by Cline, the update of which is in chapter 2. The denominator is based on the Bertaut, Kamin, and Thomas data, which must be adjusted to be consistent with the Cline projections as discussed below.

The Bertaut, Kamin, and Thomas data (the denominator) are constructed from a variety of sources including the IMF Coordinated Portfolio Investment Surveys and other balance sheet data. However, there is another source of data on US assets held abroad: the Bureau of Economic Analysis (BEA) net investment position accounts, shown in the BEA column in table 3.1. The figures for US assets held abroad according to the two datasets do not match—they are not even close. While a full discussion of why the two are so dissimilar is beyond the scope of this chapter, the differences must be reconciled because the projections of US assets held abroad (numerator) are based on the BEA data and decomposition whereas the global portfolio (denominator) is based on the sources used by Bertaut, Kamin, and Thomas (2008). Therefore, an adjustment must be made to make the two datasets comparable for the overlap year of 2006 so that the numerator and denominator start on a comparable basis.

There are two ways to make the two datasets comparable in 2006 and hold that comparison constant through the projection period. Either the ratio of the two datasets or the *level difference* between the two datasets in

2006 can be held constant. I chose to hold the level difference between the two datasets constant so as to preserve the trajectory of the projections based on the November 2008 Cline scenarios.

Modeling Portfolio Growth

The final piece of the puzzle is the underlying fundamentals of portfolio growth, which are assumed to equal non-US world GDP growth, which is taken from the Cline projections and adjusted for financial leverage. Later these two assumptions will be adjusted. The baseline growth of the global investor's portfolio is assumed to be:

$$\text{Total Portfolio}(t+1) = \text{Total Portfolio}(t) + (\text{GDP}(t-1) - \text{GDP}(t))*\text{financial leverage}$$

To generate total financial wealth of the global investor, each dollar growth of nominal non-US world GDP is assumed to expand by the financial leverage parameter. This allows examination of how the US share in the global investor's portfolio changes with different assumptions about the growth of the portfolio through GDP growth, through financial leverage, and, potentially, through home bias.

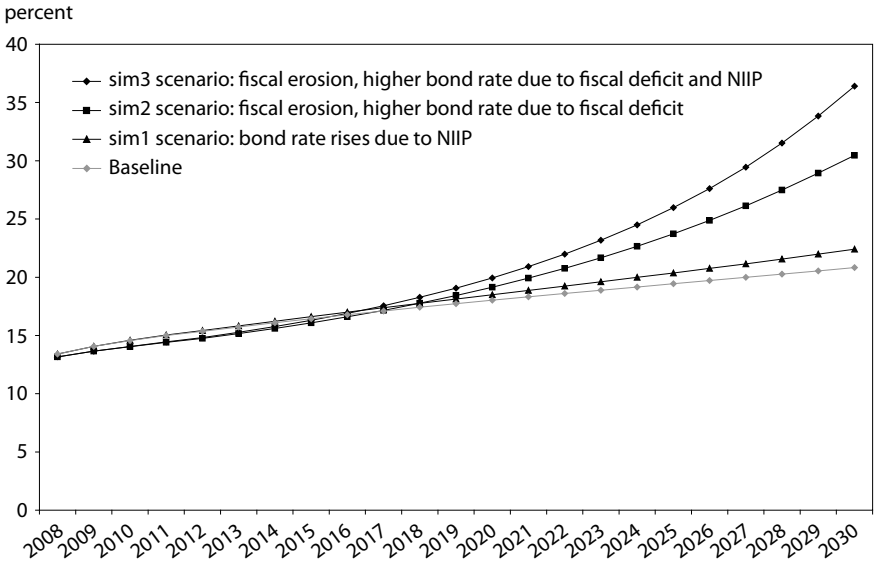
Baseline Global Wealth: Global Investor Average Shares

Figure 3.5 shows the trajectory for the share of US assets in the global investor's total portfolio using the November 2008 Cline scenarios: baseline, sim1 (bond rate rises due to NIIP), sim2 (fiscal erosion, rising bond rate due to fiscal deficit, but not NIIP, dollar depreciates, then appreciates), and sim3 (fiscal erosion, rising bond rate due to NIIP and fiscal deficit, dollar depreciates, then appreciates). (Figures in appendix 3A show the trajectory for the bond rate, the exchange value of the dollar, and price—factors important to the evolution of US assets held abroad.)

In the first scenarios, the baseline and sim1 (higher bond rate) yield a rising share of US assets in the global investor's portfolio. But by the end of the projection horizon in 2030, the US share of the total portfolio is between 20 and 25 percent—about a doubling of the current share of US assets in the total portfolio. This is similar to the Bertaut, Kamin, and Thomas (2008) scenario, which, as they note, leaves the US asset share below a reasonable weight based on market capitalization. So neither the baseline scenario nor one with higher interest rates alone appears to yield concerns about the foreign willingness to buy, although the US share of the portfolio does rise beyond what it has been in the past.

On the other hand, the fiscal erosion scenarios (sim2 and sim3) yield a US share of the global investor's portfolio rising to between 30 and 37 percent by the end of 2030. These shares are higher because higher bond yields (due to fiscal erosion in sim2) and even further increases in bond yields due to rising negative NIIP (in sim3) worsen the current

Figure 3.5 US bonds and equities: Share of global wealth portfolio, 2008–30



NIIP = net international investment position

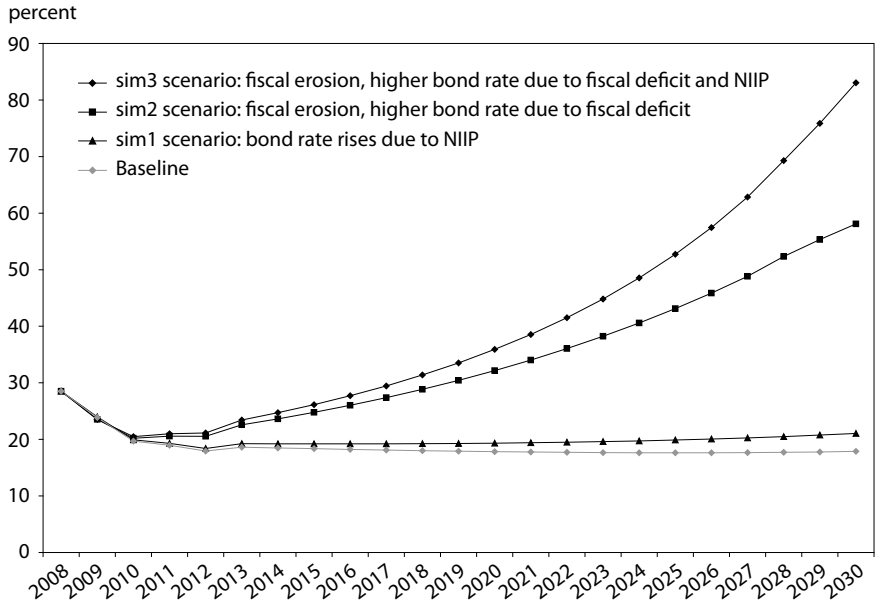
account deficit via higher net investment income payments, which then require additional US assets to be sold abroad.

Is 30 or 37 percent too high a share of US assets in the global investor's portfolio? Based on market capitalization (US market cap versus global market cap), these percentages would appear to imply US assets in the global investor's portfolio about equal to the market cap weights. Bertaut, Kamin, and Thomas note that historically the global investor has been underweight US assets. By that reasoning, global investors in the fiscal erosion scenarios would just be buying and holding what they "should" of US assets. The United States would be paying an interest premium to the foreigners to induce them to hold the assets. But, at 30 to 37 percent, the US share of the total portfolio would be larger than the nondomestic share of the global portfolio in 2006. So the global investor would have to be moving significantly away from holding his or her own domestic assets or any foreign asset other than US assets.

Baseline Global Wealth: Global Investor Marginal Shares

However, I noted another perspective in Mann (2003): It was not the *average* share in the portfolio of wealth that mattered for sustainability so much as

Figure 3.6 US bonds and equities: Share of change in global wealth portfolio, 2008–30



the *marginal* investment requirement. That is, it was the flow of US assets relative to the change in the global investor's portfolio that breached 100 percent—implying that every $1 increase in the global investor's portfolio had to be invested in US assets.

Figure 3.6 shows the calculations for this *marginal* investment requirement. For both the baseline and sim1 (bond rate rising), the marginal demand on the global investor's portfolio stays just at the 20 percent rate, consistent with the 20 percent average share reached in the first scenario. During the period 2009–13 or so, the current account is improving (due to lagged effects of dollar devaluation), so the flow of US assets abroad is not rising. In these two simulations, over the whole of the projection period, the marginal demand on the global investor's portfolio is about the average—there appear to be no problems with sustainability.

However, for the fiscal erosion scenarios (sim2 and sim3), once the lagged effect of the depreciation of the dollar on valuation erodes and the dollar starts to appreciate (due to higher relative returns), the marginal demand on the global investor's portfolio starts to increase dramatically. By the middle of the projection period (2018) the marginal US share of foreign wealth is at current average market capitalization of 30 percent. Anything above this 30 percent would indicate foreigners moving more and more of

the increase in their portfolios into US assets. By the end of the projection, the global investor has to put 60 cents (sim2) or 85 cents (sim3) of each $1 increase in his or her portfolio into US assets. This looks unreasonable! It implies a shift away from "home" bias toward "US asset" bias. Therefore, as with Mann (2003), it is not so much the average investment that might drive an unsustainable situation but rather the marginal demand on the global investor's portfolio.

Baseline Global Wealth: Global Investor Purchases of Bonds Only—Marginal and Average Shares

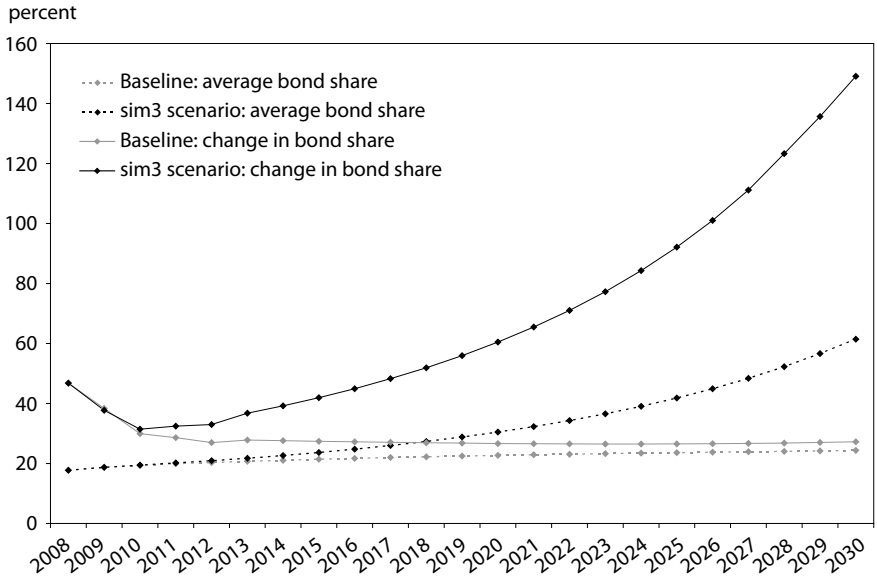
The point about the difference between portfolio investment on average and investment of the marginal increase in the portfolio is even more abundantly clear when just the projections for the bond portfolio are considered. As it turns out, the Cline projections for changes in US assets held abroad channel only through the bond portion of the portfolio. His projections for FDI and US equity held abroad do not change across the various simulations. This, it could be argued, is consistent with the fiscal erosion scenario, whereby the US government must issue an increasing amount of US bonds. Therefore, the demand on the global investor's *bond* portfolio might be most vulnerable. Figure 3.7 shows both the average and marginal investment of US bonds in the global investor's bond portfolio under the Cline baseline and sim3 (fiscal erosion, bond rate rises) scenarios.

Under the baseline scenario, neither the average nor the marginal investment in bonds seems too unreasonable—in fact, there seems to be little pressure on the global investor's portfolio allocation to change from its current allocation.

On the other hand, consider the most extreme fiscal erosion scenario where bond rates rise on account of fiscal erosion and NIIP (sim3). The average share of US bonds in the portfolio seems manageable (and perhaps desired given the assumed higher yield on the US bonds), with the average share rising to 60 cents of each dollar in the global investor's portfolio. Recall that the Bertaut, Kamin, and Thomas (2008) analysis found that the share of US bonds in bond market capitalization ranged from about 40 to 45 percent. This benchmark is breached, in terms of average share in the global portfolio, in about 2024 for the most extreme sim3 scenario; 2024 is a long way off.

However, if we consider the *marginal* demand on the global investor's bond portfolio, by 2025, 100 percent of each $1 increase in global wealth must be allocated to US bonds. More potently, the marginal demand breaches the maximum historical average holding in about 2014 in the extreme sim3 scenario. Put differently, if foreign investors keep to their historical pattern of holding US bonds in their portfolio, the US current account becomes financially unsustainable in 2014 because at that point,

Figure 3.7 US bond assets: Share of global bond portfolio and share of change in global bond portfolio, 2008–30



more than 40 cents of each $1 increase in the foreign investor's bond portfolio must be allocated to US bonds.

Alternative Scenarios for Global Wealth: Slower Growth and Lower Financial Leverage

It is useful to do a sensitivity analysis on these projections. The most obvious issue is whether the global portfolio of wealth will grow as fast as assumed.[11] Two key ingredients are non-US GDP growth and financial leverage, or the extent to which each dollar of GDP growth is magnified into a growing wealth portfolio. A change in home bias is a third way in which to vary these scenarios but yields no new insights. Figure 3.8 (for the average share) and figure 3.9 (for the marginal investment) present sensitivity analysis along these two parameters for the total wealth portfolio.

- *Slower global growth*: The non-US rate of GDP growth is held 1 percentage point less than that assumed by Cline in November 2008. This assumption is for the financial side only and does not consider

11. Given the precipitous decline in global growth rates between November 2008 and April 2009, even the slow-growth assumptions used here likely overstate global growth.

Figure 3.8 US bonds and equities, alternative scenarios: Share of global wealth portfolio, 2008–30

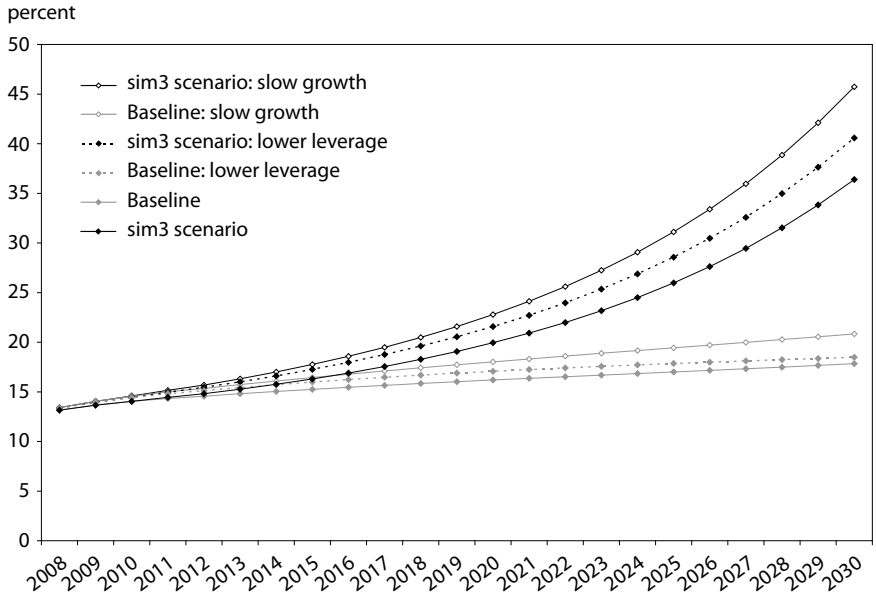
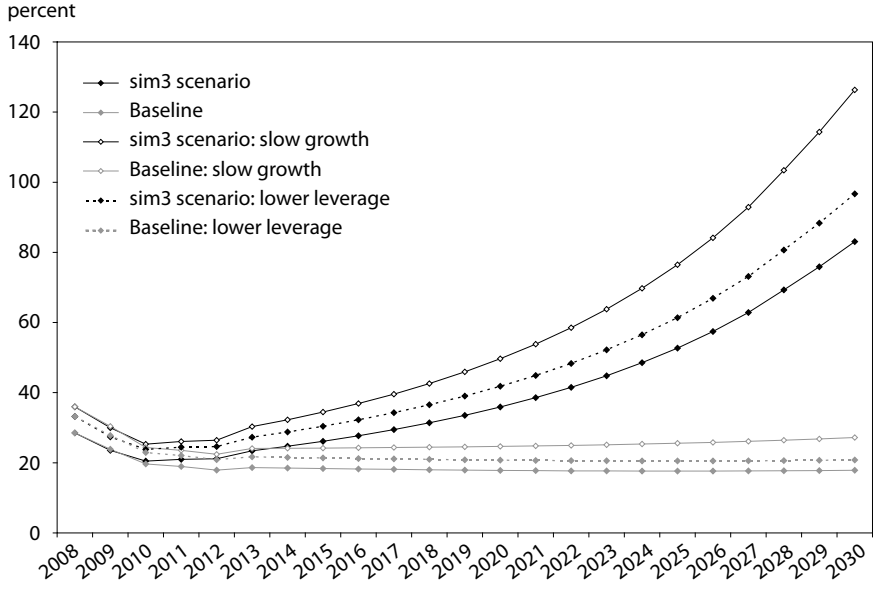


Figure 3.9 US bonds and equities, alternative scenarios: Share of change in global wealth portfolio, 2008–30



the impact of slower growth on US exports and the current account. Therefore, this assumption supports a relatively benign trajectory for the US current account.

- *Lower financial leverage*: The financial leverage parameter is assumed to fall from 1.6 to 1.4. This might be related to a deleveraging of the global financial system away from bonds and equity towards bank loans and deposits in response to recent stresses.

The bottom line from these alternative scenarios is that under the baseline scenario, even slower non-US global GDP growth and financial deleveraging do not appear to generate financially unsustainable conditions. In terms of both average share and marginal investment, the numbers for how much the global investor "needs" to buy US assets remain around historical norms—in the 20 to 30 percent range.

On the other hand, the situation in the most severe fiscal erosion scenario (sim3) is made worse by both slower global growth and deleveraging because both of these situations reduce the growth in the global investor's portfolio of wealth. Comparing the two alternative assumptions, the prospects for a financially unsustainable US current account deficit hinges more on growth prospects than on financial deleveraging. That is, the scenarios are quite sensitive to a 1 percentage point reduction in nominal non-US global growth (a reduction in global growth, which is quite plausible). The scenarios are less sensitive to the assumed financial deleveraging from 1.6 to 1.4 (which is much lower than historical experience).

Considering just the bond financing (not shown), the fiscal erosion scenarios combined with slower global GDP growth and commensurate slower growth of global investable wealth immediately breach historical parameters of the bond component of the financing of the US current account deficit. By 2016, even switching from bond to equity financing puts the financial picture under stress. In sum, the combination of fiscal erosion, slower growth, and financial deleveraging would appear to yield near immediate financial unsustainability unless foreign investors alter substantially their preferences toward holding US assets, particularly bonds.[12]

Conclusion

International financial theory points to two analytical approaches to modeling financial sustainability: Is an external deficit unsustainable because a country is unable to make good on (e.g., repay with interest) its previously incurred liabilities or because foreign investors are unwilling

12. This indeed has occurred during the early part of 2009 but, depending on a near permanent "flight to risk-free US assets," it is probably also not sustainable.

to buy the assets that are being offered in the global marketplace because they have enough already? The essence of sustainability research is to undertake projections of the US external deficit and consider both analytical propositions to see in which situation the United States appears most vulnerable.

Challenges face those who do projections for either analytical proposition. On the side of "ability to repay" the biggest challenges are valuation effects and rate-of-return differentials, which can make or break conclusions with regard to the size of the NIIP, the magnitude of net investment income, and therefore the sustainability of the US current account deficit as judged from this US-centric perspective. On balance, previous researchers find that if valuation effects and the FDI premium are observed in the future more or less as they have been in the past, the US-centric "ability to pay" criterion for sustainability is not likely to be the source of financial vulnerability until well out in any projection horizon—that is, beyond 2020. Only radical assumptions of no valuation effects and complete erosion of the FDI premium lead to the conclusion that the United States likely would be unable or unwilling to make good on its obligations.

The main challenge facing those who assess sustainability from the point of view of the global investor is how to value and project the global investor's portfolio. At a minimum, such projections need to consider the future path of the global portfolio of wealth, which includes GDP growth, financial leverage, and home bias. Previous research suggests that the inconsistency between the growth of the global investor's portfolio and the supply of US assets in the global marketplace was one source of financial vulnerability in 2001 and was associated with the timing of the dollar depreciation then.

This chapter has considered new projections of the US current account and of global investable wealth to address the question of financial vulnerability in light of the potential for significant erosion of the fiscal budget in the United States.

Under the baseline scenario, neither the average nor the marginal purchase of US assets by the global investor seems too unreasonable—in fact, there seems to be little pressure on the global investor's portfolio allocation to change from its current allocation.

On the other hand, in the most extreme fiscal erosion scenario (sim3—fiscal deficit, larger NIIP, and higher bond rates for both reasons) quite quickly after the initial valuation effects of dollar depreciation wear off (2013 or so), the marginal demand on the global investor's portfolio to be allocated to US bonds breaches the maximum historical average of 45 percent in about 2014. Thus, if foreign investors keep to their historical pattern of holding US bonds in their portfolio, the US current account becomes financially unsustainable in just a few years.

Alternative scenarios for a slower-growing global wealth portfolio, including from slower non-US global GDP growth and financial

deleveraging, make it more difficult for the United States to finance the current account deficit, but only in the case of the fiscal erosion scenarios. Prospects for an unsustainable US deficit hinge more on foreign growth prospects than on financial deleveraging. The very real prospects for slower global growth and financial deleveraging, combined with the very likely significant increase in the fiscal deficit, point to near immediate financial unsustainability.

In considering all the research, the marginal demand on the global investor's portfolio is the best way to look at US financial sustainability. Under the baseline scenario, this marginal demand on the global investor's portfolio remains within historical norms. However, given the fiscal erosion scenarios, US external financing needs could, in just a few years, breach these historical norms. Prospects for slower foreign GDP growth and financial deleveraging, both of which slow the growth in the foreign portfolio of wealth, exacerbate the situation, with a near immediate possibility of financial unsustainability. Whether the global investor demands higher interest rates to purchase US assets or chooses not to purchase US assets and so lets the dollar depreciate remains to be seen.

References

Bertaut, Carol, Steve Kamin, and Charles Thomas. 2008. *How Long Can the Unsustainable US Current Account Be Sustained?* International Finance Discussion Paper 935 (July). Washington: Federal Reserve Board of Governors.

Cline, William R. 2005. *The United States as a Debtor Nation*. Washington: Institute for International Economics and Center for Global Development.

Curcuru, Stephanie E., Charles P. Thomas, and Frank E. Warnock. 2008. Current Account Sustainability and the Relative Reliability of the International Accounts. University of Wisconsin. Photocopy (April).

Curcuru, Stephanie E., Tomas Dvorak, and Francis E. Warnock. 2007. *The Stability of Large External Imbalances: The Role of Returns Differentials*. International Finance Discussion Paper 894 (April). Washington: Federal Reserve Board of Governors.

Freund, Caroline, and Frank E. Warnock. 2007. Current Account Deficits in Industrial Countries: The Bigger They Are the Harder They Fall? In *G7 Current Account Imbalances Sustainability and Adjustment*, ed. Richard H. Clarida. Cambridge, MA: National Bureau of Economic Research and University of Chicago Press.

Gagnon, Joseph E. 1996. *Net Foreign Assets and Equilibrium Exchange Rates: Panel Evidence*. International Finance Discussion Paper 574. Washington: Federal Reserve Board of Governors.

Gourinchas, Pierre-Olivier, and Hélène Rey. 2007. From World Bank to World Venture Capitalist: US External Adjustment and the Exorbitant Privilege. In *G7 Current Account Imbalances Sustainability and Adjustment*, ed. Richard H. Clarida. Cambridge, MA: National Bureau of Economic Research and University of Chicago Press.

Henderson, Dale, and Kenneth Rogoff. 1982. Negative Net Foreign Asset Positions and Stability in a World Portfolio Balance Model. *Journal of International Economics* 13: 85–194.

Higgins, Matthew, Thomas Klitgaard, and Cedric Tille. 2006. *Borrowing Without Debt? Understanding the US International Investment Position*. Federal Reserve Bank of New York Staff Report 271 (December). New York: Federal Reserve Bank of New York.

Higgins, Mathew, Thomas Klitgaard, and Cedric Tille. 2005. The Income Implications of Rising US International Liabilities. *Current Issues in Economics and Finance* 11, no. 12 (December). New York: Federal Reserve Bank of New York.

Lane, Phillip R., and Gian Milesi-Ferretti. 2007. A Global Perspective on External Positions. In *G7 Current Account Imbalances Sustainability and Adjustment*, ed. Richard H. Clarida. Cambridge, MA: National Bureau of Economic Research and University of Chicago Press.

Kitchen, John. 2007. Sharecroppers or Shrewd Capitalists? Projections of the US Current Account, International Income Flows, and Net International Debt. *Review of International Economics* 15, no. 5: 1036–61.

Mann, Catherine L. 1999. *Is the US Trade Deficit Sustainable?* Washington: Institute for International Economics.

Mann, Catherine L. 2002. Perspectives on the US Current Account Deficit and Sustainability. *Journal of Economic Perspectives* 16, no. 3 (Summer): 131–52.

Mann, Catherine L. 2003. *How Long the Strong Dollar?* In *Dollar Overvaluation and the World Economy*, ed. C. Fred Bergsten and John Williamson. Washington: Institute for International Economics.

Mann, Catherine L., and Katharina Plück. 2006. The United States as Net Debtor: How Much Longer the "Exorbitant Privilege"? In *Sharing the Growing Burden of World Order*, ed. Jens van Scherpenberg and Katharina Plück. Berlin: SWP.

Roubini, Nouriel, and Brad Setser. 2004. The US as a Net Debtor: The Sustainability of the US External Imbalances. Photocopy (November).

Truman, Edwin M. 2005. *Postponing Global Adjustment: An Analysis of the Pending Adjustment of Global Imbalance*. Working Paper 05-6. Washington: Institute for International Economics.

Appendix 3A Relevant variables from the Cline November 2008 projections, 2006–30

Figure 3A.1 Bond rate

percent

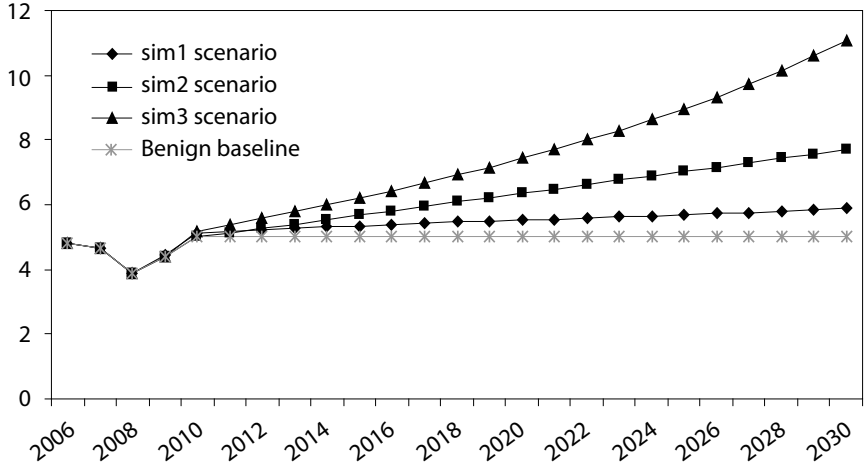
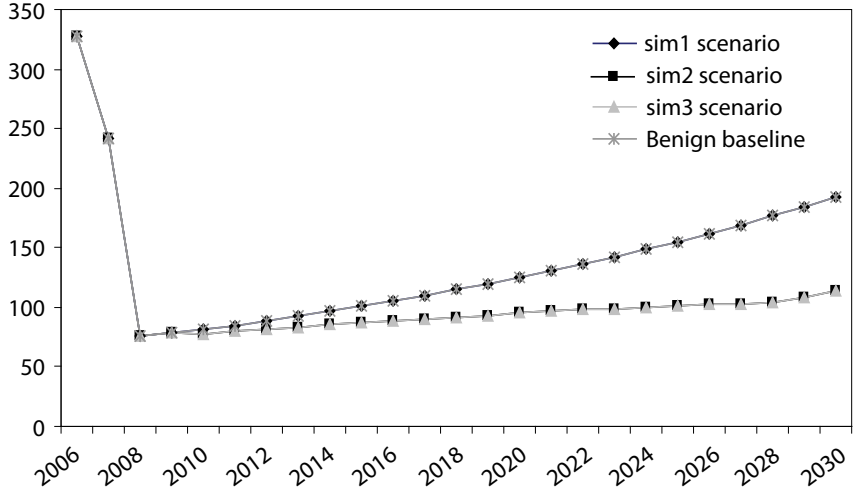


Figure 3A.2 Valuation changes: Prices

billions of dollars



Appendix 3A Relevant variables from the Cline November 2008 projections, 2006–30 *(continued)*

Figure 3A.3 Valuation changes: Exchange rate

billions of dollars