

Current Issues

IN ECONOMICS AND FINANCE

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The Impact of Exchange Rate Movements on U.S. Foreign Debt

Cédric Tille

In 2001, the United States' net debt to the rest of the world jumped to \$2.3 trillion, a level double that recorded in 1999. Much of the increase reflects the new borrowing undertaken by the country to finance its mounting current account deficit. A third of the change, however, can be traced to a simple accounting effect—the impact of a rising dollar on the value of U.S. assets held abroad.

The sizable current account deficits run by the United States in the 1990s have been accompanied by a substantial accumulation of debt to foreign investors. At the end of 2001, foreign investors owned \$9.2 trillion worth of U.S. assets, including stock and bond holdings and ownership shares of business enterprises. U.S. investors, by contrast, owned a more modest \$6.9 trillion worth of foreign assets. The difference in value between U.S. holdings of foreign assets and foreign holdings of U.S. assets—here \$2.3 trillion—is a measure of the net debt of the United States to the rest of the world, or the U.S. *net international investment position*. This position deteriorated significantly after the mid-1990s, with the pace of the decline accelerating sharply following the start of the new century. Indeed, since the end of 1999, U.S. net debt has more than doubled.

Several commentators have voiced concern that the nation's investment relationship with the rest of the world may prove unsustainable (IMF 2002; Mann 2002). The United States relies on fresh funds from other countries to finance its current account deficit (see Higgins and Klitgaard [1998]). As the nation's already-large debt to foreign countries grows, investors may become increasingly

reluctant to lend additional funds. If so, the United States might be compelled to reduce its current account deficit through slower growth or a depreciation of the dollar (Freund 2000).¹

In this edition of *Current Issues*, we investigate whether the change in the U.S. international investment position is as worrisome as it may appear. To do so, we analyze the mechanisms that affect this position—namely, financial flows and valuation changes, including changes in exchange rates. We find that almost a third of the recent acceleration in the net indebtedness of the United States stems from the impact of a strong dollar on the value of U.S. assets. The sizable role played by this mechanical valuation effect in the debt increase suggests that the situation may be less dire than many have feared. Moreover, our analysis offers grounds for concluding that the recent depreciation of the dollar may reverse the valuation effect and improve the U.S. balance sheet going forward.

Tracking the Changes in the U.S. Position

At the end of each year, the Bureau of Economic Analysis (BEA) produces estimates of U.S. gross assets and U.S. gross liabilities.² The asset measure captures the value of

U.S. residents' holdings of foreign stocks and bonds, ownership of foreign business enterprises (*foreign direct investment*), and claims on foreign banks, as well as U.S. official reserves. The liabilities measure captures the value of U.S. assets held by foreign residents. The BEA bases its estimates of gross assets and liabilities on data gathered through periodic benchmark surveys conducted by the U.S. Treasury.³

The most recent available BEA numbers are for the end of 2001 and incorporate revisions from the results of the 2000 benchmark survey of Foreign Holdings of U.S. Long-Term Securities.⁴ While the value of portfolio holdings in equities and bonds can easily be measured from market indexes, valuing the stock of foreign direct investments is less straightforward. The BEA publishes estimates based on two different measures: current cost (derived from the current replacement cost of the capital) and market value (derived from stock market indexes, starting in 1982). Although the two measures yield similar results, we use the second of the two because it captures changes in market valuations.⁵

The BEA's estimates of gross assets and gross liabilities provide a useful picture of the U.S. financial position relative to the rest of the world. By subtracting the value of U.S. gross liabilities from the value of U.S. gross assets, we arrive at the net international investment position of the United States.

If we track the changes in this position over the past twenty years, we see a marked deterioration (Chart 1). In 1982, the nation's gross assets exceeded its gross liabilities by \$0.2 trillion. By 1989, however, the U.S. net position had turned negative, indicating that the country had become a net debtor to the rest of the world. The U.S. position declined further in subsequent years until, at the end of 2001, the nation owed the world \$2.3 trillion in net terms. By this mea-

sure, the United States was one of the biggest debtors among all industrialized economies.⁶

Although the net international investment position of the United States has fallen throughout the 1982-2001 period, the rate of the decline has increased sharply in recent years (Table 1). Until 1995, the U.S. position deteriorated, on average, by no more than \$50 billion a year. Between 1995 and 1999, the pace picked up, reaching an annual average of \$178 billion. The most rapid deterioration, however, took place between the end of 1999 and the end of 2001, when the U.S. position fell \$628 billion on average each year and the country's net foreign debt more than doubled.⁷

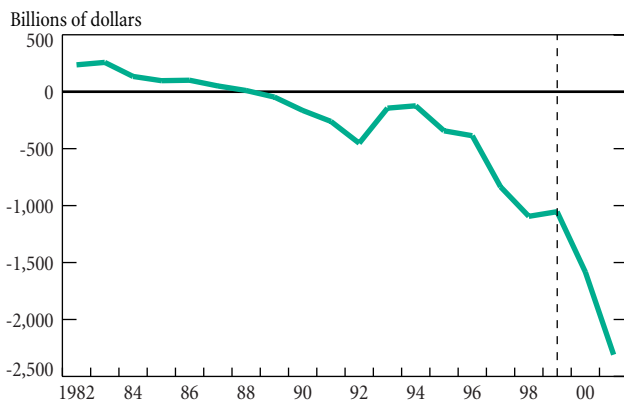
A look at the individual paths of U.S. gross assets and U.S. gross liabilities over these same intervals is also revealing. One might expect that the deterioration of the U.S. net international investment position after 1982 stemmed in part from a contraction in the value of U.S. assets. In fact, however, the value of these assets rose over much of the period and nearly doubled between 1995 and 1999 (Chart 2 and Table 1). This increase was accompanied by a similar, but larger, increase in the value of U.S. liabilities. The especially sharp upswing in both assets and liabilities during the 1990s reflects the enormous growth in international financial integration during this decade.⁸

After 1999, however, the path of gross assets diverged from that of gross liabilities. While the value of gross liabilities kept increasing (albeit at a reduced pace), the value of gross assets leveled off in 2000 and then fell (Chart 2 and Table 1).⁹ Clearly, the steep decline in the U.S. net international investment position after 1999 owes much to this drop in asset value at the start of the century.

Financial Flows and Valuation Changes

Thus far, we have tracked the deterioration of the U.S. investment position and the movements in assets and liabilities that underlie it. But to understand the evolution of the U.S. position more fully—and to determine whether the enormous buildup of debt to foreign investors is as troubling as it appears—we need to examine the two mechanisms that

Chart 1
U.S. Net International Investment Position
Assets minus Liabilities



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Table 1
Average Annual Changes in U.S. Positions
Billions of Dollars

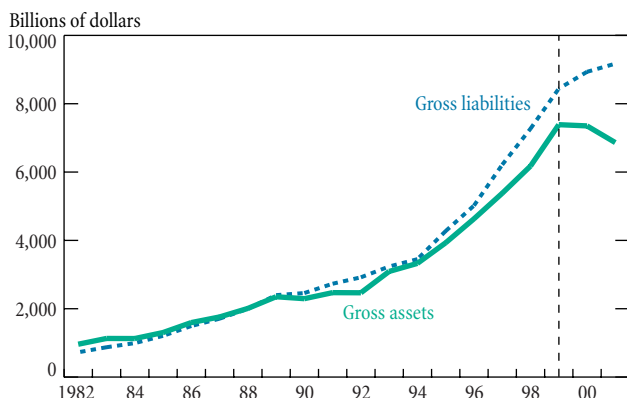
	1982-90	1990-95	1995-99	1999-2001
Gross assets	167	327	864	-262
Gross liabilities	217	363	1,042	366
NIIP	-50	-36	-178	-628

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Notes: NIIP is the net international investment position. All positions are measured at year-end.

Chart 2

U.S. Gross Asset and Gross Liability Positions



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

affect assets and liabilities: changes in financial flows and changes in valuation.

Financial flows. The U.S. net international investment position declines when the country borrows fresh funds from the rest of the world. This inflow of funds is driven by the current account deficit: Because the United States imports more goods and services than it exports, the proceeds from exports are insufficient to pay for the full cost of imports. The country must make up the difference either by liquidating its assets abroad or by obtaining new credit from foreigners. In its recourse to such financing—and the ensuing decline in its position—the country might be likened to a household that weakens its financial position by increasing its credit card debt to pay for current consumption.

Valuation changes. Even when no new borrowing occurs, the U.S. net international investment position may rise or fall with changes in the value of the existing stocks of assets and liabilities. Valuation changes can take the form of fluctuations in asset prices or changes in exchange rates. To understand how such changes affect the U.S. net investment position, consider the impact of a U.S. stock market boom. The rise in the value of U.S. equities held by foreign investors would increase U.S. gross liabilities and consequently reduce the country’s net investment position. The sensitivity of the country’s position to valuation changes can also be understood through an analogy to a household that sees its financial position decline with a drop in stock prices.

The degree to which each of these mechanisms shapes the U.S. net international investment position will affect the judgments we make about the gravity of the U.S. net debt problem. An accumulation of new liabilities by the United States that stems from persistent current account deficits can be a significant cause for concern. Reducing, or even stabilizing, the

stock of U.S. liabilities will require cutbacks in investment and spending that can impose strain on the economy by slowing growth (Freund 2000). However, a worsening of the net international investment position that results from valuation effects is relatively less worrisome. Because asset prices and exchange rates exhibit more volatility than real variables such as GDP, the net international investment position can be quickly stabilized or reduced through price movements, with little adverse impact on growth.

A Decomposition of the Changes in U.S. Gross Assets and Gross Liabilities

To assess the relative importance of financial flows and valuation changes in shaping the path of the U.S. net international investment position, we break down the changes in U.S. gross assets and U.S. gross liabilities over the 1990-2001 period by their source. Data published by the Bureau of Economic Analysis allow us to distinguish the contribution of valuation changes from that of financial flows fairly easily. Disentangling the contributions of asset price fluctuations and exchange rate shifts—the two forms of valuation change—is more difficult, however. The figures appearing in the *Survey of Current Business* cover only preliminary data for the most recent year.¹⁰ We rely on these preliminary data to construct estimates of the effects of asset price changes and exchange rate shifts after 1990.¹¹

How Valuation Effects Work

Before we present our findings, we comment briefly on the magnitude and direction of valuation effects on the U.S. gross and net positions. The impact of asset price changes on the U.S. net position depends on the extent to which U.S. and foreign asset markets move in step. If the markets are indeed correlated, a price change can alter the value of U.S. gross assets and U.S. gross liabilities to a similar extent. Since the change in gross liabilities largely offsets the change in gross assets, the impact on the net international investment position is likely to be moderate.

Whether the valuation effects from currency movements improve or weaken the U.S. net position depends on the exchange rate exposure of the gross assets and gross liabilities. For example, an appreciation of the dollar reduces the value (in dollars) of assets and liabilities denominated in foreign currency but has no impact on the value (in dollars) of assets and liabilities denominated in dollars. If foreign-currency-denominated securities account for a smaller amount of U.S. gross assets than of U.S. gross liabilities, an appreciation of the dollar will reduce the value of these assets by less than it reduces the value of the liabilities, leading to an improvement in the net international investment position. By

contrast, if foreign-currency-denominated securities make up a larger amount of U.S. gross assets than of U.S. gross liabilities, the stronger dollar will lower the value of U.S. gross assets by more than it lowers the value of U.S. gross liabilities, and the net international investment position will worsen. Since the latter condition actually holds—securities denominated in a foreign currency account for a larger amount of U.S. assets than of U.S. liabilities—we can expect an appreciation of the dollar to hurt the net international investment position.¹²

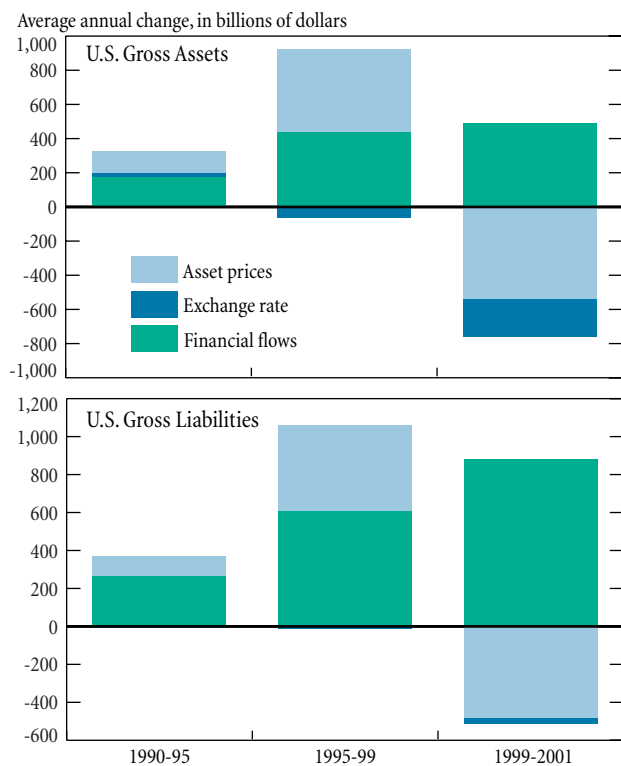
Effects of Financial Flows, Asset Prices, and the Exchange Rate on U.S. Gross Positions

Our decomposition of the changes in U.S. gross assets and gross liabilities shows that the substantial increase in the value of assets and liabilities between 1990 and 1999 was driven largely by financial flows and rising asset prices (Chart 3). The large role played by these forces reflects the rapid growth in international financial integration during the decade and the surge in the stock markets of most industrialized countries between December 1995 and December 1999 (Table 2). By contrast, the exchange rate had a relatively limited effect on

gross positions in the 1990s. The appreciation of the dollar that began in 1995 reduced the value of U.S. gross assets modestly and the value of U.S. gross liabilities even less.¹³

However, we see a marked turnaround in valuation effects in the 1999-2001 period as falling asset prices and a rising dollar combined to reduce the value of U.S. gross assets and gross liabilities sharply. The impact through asset prices was large for both assets and liabilities; the exchange rate shift had a relatively smaller effect. What is most remarkable, however, is that the impact of the dollar appreciation on U.S. gross asset values quadrupled between the 1995-99 period and the 1999-2001 period, increasing from -\$57 billion to -\$217 billion. This pattern reflects two factors. First, the appreciation of the dollar against the currencies of its twenty-five main trading partners rose from an annual average of 3.4 percent between 1995 and 1999 to an annual average of 6.8 percent between 1999 and 2001 (Table 2). Second, the amount of U.S. gross assets increased substantially between 1995 and 1999 as a result of financial integration (Chart 2). As we explain in the box on page 5, a given exchange rate movement will lead to a larger valuation effect as the amount of gross assets to which it applies increases, with little offsetting effect on the liability side.

Chart 3
Accounting for the Changes in U.S. Gross Asset and Gross Liability Positions



Sources: U.S. Department of Commerce, Bureau of Economic Analysis; author's calculations.

Understanding the Change in the U.S. Net International Investment Position

Drawing on our analysis of the changes in U.S. gross assets and gross liabilities, we can see how the U.S. net international investment position has evolved over the 1990-2001 period. Throughout this period, financial flows have been the chief mechanism driving the deterioration of the country's investment relationship with the rest of the world. Since

Table 2
Average Annual Changes in Asset Prices and the Exchange Rate
Percent

	December 1995-December 1999	December 1999-December 2001
Stock market indexes		
United States (S&P 500)	23.5	-10.5
United Kingdom (FTSE 100)	17.1	-13.2
Germany (DAX)	32.6	-13.9
France (CAC 40)	33.6	-11.9
Japan (Nikkei 225)	-1.2	-25.4
Exchange rate		
Value of the dollar	3.4	6.8

Source: Bank for International Settlements.

Notes: The exchange rate is a trade-weighted index against the United States' twenty-five main trading partners. An increase denotes an appreciation of the dollar.

How Financial Integration Magnifies the Effect of Exchange Rate Fluctuations

A simple example reveals why a movement in the exchange rate has a more substantial effect on countries that have acquired large gross asset and gross liability positions as a result of financial integration. Consider two cases: one in which the level of financial integration is low, with the value of U.S. assets and liabilities standing at \$100 billion and \$200 billion, respectively, and one in which the level of financial integration is high, with U.S. assets and liabilities valued at \$1,000 billion and \$1,100 billion, respectively. Note that in both cases, the United States is a net debtor, owing \$100 billion to the rest of the world.

Assume that the currency composition of assets and liabilities is the same in both cases. Specifically, suppose that U.S. liabilities are entirely denominated in dollars, while 40 percent of U.S. assets are denominated in foreign currency—a breakdown that conforms fairly closely to the actual composition of U.S. assets and liabilities.

Now consider the impact of a 10 percent appreciation of the dollar (see the table). In both the low-integration and the high-integration cases, the value of liabilities is unchanged

while the value of assets decreases by 4 percent (that is, 10 percent \times 40 percent). When financial integration is high, however, this 4 percent reduction applies to a larger amount of assets, so in dollar terms the asset position contracts by more in the high-integration case (\$40 billion) than in the low-integration case (\$4 billion).

The value of the net position then declines more in the high-integration case, both in dollar terms (\$40 billion as compared with \$4 billion) and relative to the initial value of the net position (40 percent as against 4 percent).

Impact of a 10 Percent Dollar Appreciation

Billions of Dollars Except As Noted

	Level of Financial Integration	
	Low	High
Change in the value of liabilities	0	0
Change in the value of assets	-4	-40
Change in the value of the net position	-4	-40
Change in the initial net position (percent)	-4	-40

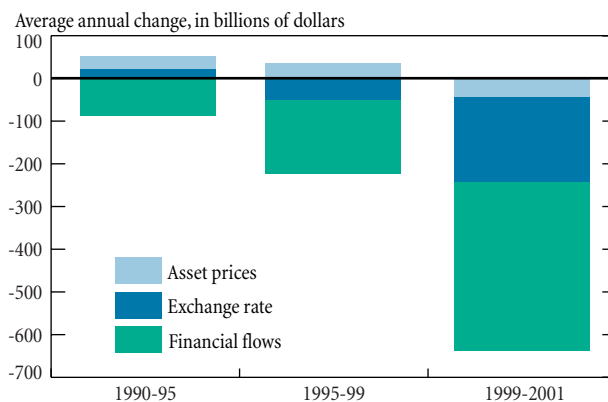
1999, however, valuation changes have also emerged as a significant contributor to the country's worsening position (Chart 4).

For most of the past decade, valuation changes played a negligible or mildly beneficial role. Between 1990 and 1995, these changes modestly strengthened the net international investment position, although not enough to overcome the negative effects of financial flows.¹⁴ Valuation changes had an even smaller impact between 1995 and 1999, when the effects of rising asset prices and an appreciating dollar effectively canceled each other out.

As Chart 4 shows, however, the situation changed dramatically after 1999. Between 1999 and 2001, valuation changes accounted for 37 percent of the deterioration of the U.S. net international investment position. Although falling asset prices figured in this decline, their influence was small, because large decreases in the value of U.S. gross liabilities compensated for much of the reduction in the value of gross assets. By contrast, the impact of the exchange rate was substantial, with the strengthening of the dollar accounting for a remarkable 30 percent of the decline in the net international investment position. The size of the exchange rate effect in net terms owes much to the concentration of the effect on the asset side of the U.S. position; the liability side, largely denominated in dollars and thus insulated from changes in the dollar's value, provides little offset.

Our findings suggest that the rapid increase in the U.S. net foreign debt may be a somewhat less formidable problem than is often assumed. If one-third of the 1999-2001 acceleration reflects what is essentially an accounting effect from the strong dollar, then a decline in the value of the dollar should cause the mechanism to operate in reverse. Thus, the dollar depreciation we have observed since the beginning of 2002 may well improve the country's investment position with the rest of the world.

Chart 4
Accounting for the Changes in the U.S. Net International Investment Position



Sources: U.S. Department of Commerce, Bureau of Economic Analysis; author's calculations.

A Closer Look at the U.S. Investment Position in Different Asset Categories

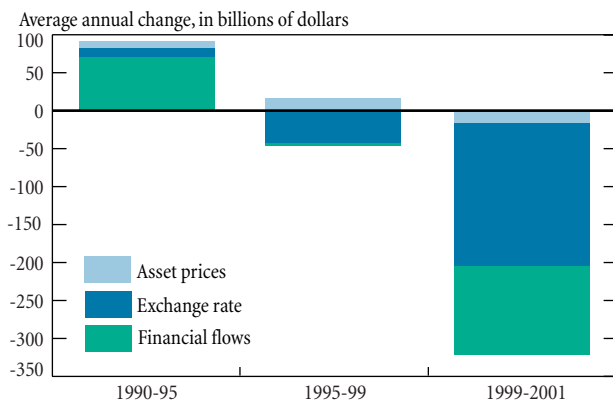
Our analysis also allows us to identify the categories of securities in which valuation effects were concentrated. We focus first on foreign direct investment holdings and stocks, and then on bonds, including Treasury bills.

After increasing in the early 1990s, the U.S. net position in foreign direct investment and stocks fell in the second half of the decade; the decline accelerated after 1999. We find that valuation changes played a substantial role in the deterioration of this position, with the strong dollar since 1999 accounting for 58 percent of the total change (Chart 5). By contrast, valuation changes had only a marginal effect on the net investment position in bonds (Chart 6). This position was driven instead by financial flows as foreign investors stepped up their purchases of U.S. securities.

Conclusion

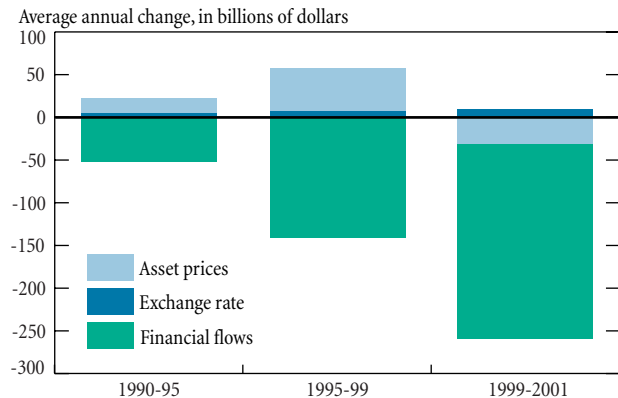
The U.S. net international investment position has substantially deteriorated over the last twenty years, with the pace accelerating in the last two years when the U.S. net debt to foreign investors doubled. While financial flows stemming from the current account deficits have been the primary source of the growing U.S. debt, our analysis shows that much of the recent acceleration stems from the appreciation of the dollar. This mechanical valuation effect accounts for nearly one-third of the deterioration of the net international investment position since the end of 1999—a sharp contrast with the past when valuation effects were either negligible or modestly advantageous. The more prominent role played by exchange rate movements reflects not only the large appreciation of the dollar in recent years, but also the dramatic increase in the amount of U.S. gross assets.

Chart 5
Net Foreign Direct Investment and Stocks



Sources: U.S. Department of Commerce, Bureau of Economic Analysis; author's calculations.

Chart 6
Net Bonds



Sources: U.S. Department of Commerce, Bureau of Economic Analysis; author's calculations.

Exchange rate changes are usually thought to affect the external position of a country through their impact on foreign trade. Thus, the depreciation of the dollar that began in early 2002 would be expected to improve the U.S. net international investment position by making exports more competitive and thereby reducing the U.S. reliance on foreign financial flows. The valuation effect examined in this article provides an additional mechanism through which the current depreciation of the dollar might improve the U.S. net position. Interestingly, while changes in foreign trade patterns are likely to emerge only over time, valuation changes have the advantage of taking effect immediately.

Notes

1. Some commentators, however, have cautioned against too pessimistic a reading of the U.S. net international investment position, arguing that the accumulation of liabilities attests to other countries' confidence in the U.S. economy. See, for example, Cooper (2001).
2. The figures are published in the journal *Survey of Current Business* in the summer of the following year. See U.S. Department of Commerce, Bureau of Economic Analysis (1990-2002) for the estimates used in this article.
3. For a detailed discussion of the data sources and concepts, see Griever, Lee, and Warnock (2001).
4. See Nguyen (2002) for a discussion of the 2001 numbers. Earlier BEA numbers were subject to substantial revisions, as explained by Warnock and Cleaver (2002).
5. For more discussion of the valuation methods, see Landefeld and Lawson (1991) and Nguyen (2002).
6. The most recent International Monetary Fund data that permit an international comparison are for 2000, when the U.S. net debt accounted for 16 percent of GDP. The only industrialized countries posting larger debt-to-GDP ratios were Canada (23 percent), Sweden (42 percent), Australia (53 percent), and New Zealand (91 percent).

7. The pickup in the pace is still apparent if we scale the data by GDP. Between 1982 and 1990, the ratio of the U.S. net international investment position to GDP decreased, on average, by 1.3 percentage points annually. The pace slowed down to an average annual decrease of 0.4 percentage point in 1990-95, then accelerated to annual decreases of 1.7 and 5.6 percentage points in 1995-99 and 1999-2001, respectively.

8. See Lane and Milesi-Ferretti (2002) for a discussion.

9. The pattern is similar if we scale the data by GDP. The average annual percentage point changes in the ratio of assets to GDP were as follows: 1.3 (1982-90), 2.7 (1990-95), 6.6 (1995-99), and -6.2 (1999-2001). The corresponding values for the ratio of liabilities to GDP are 2.5, 3.1, 8.3, and -0.6.

10. For example, the July 2002 release includes a decomposition of the valuation between December 2000 and December 2001 but does not include a revised decomposition for earlier years.

11. The details of the estimation method are available upon request.

12. Stock holdings and foreign direct investment are typically denominated in the currency of the country where the investment takes place. Thus, European stocks are denominated and traded in euros, while U.S. stocks are denominated and traded in dollars. U.S. gross assets in foreign direct investment and equity are then mostly denominated in foreign currency, while U.S. gross liabilities in foreign direct investment and equity are mostly denominated in dollars.

As for bond holdings, recent benchmark surveys show that U.S. gross assets in these securities are denominated in foreign currency to a substantial extent. (The surveys are available at <http://www.treas.gov/tic/fpis.html>.) The 1997 survey of U.S. Holdings of Foreign Long-Term Securities shows that 42 percent of U.S.-held foreign bonds are denominated in foreign currency (Table 7, p. 12). On the liability side, the 2000 survey of Foreign Holdings of U.S. Long-Term Securities indicates that 90 percent of U.S. bond liabilities are denominated in dollars (Table 21, p. 70). For a discussion of the data on long-term securities, see Grier, Lee, and Warnock (2001).

13. Since the net international investment position is computed at the end of each year, we base our computations on the December values of asset prices and exchange rates.

14. In the 1980s, valuation changes also improved the net international investment position. The \$50 billion average annual decline in the net international investment position between 1982 and 1990 (Table 1) can be decomposed into a \$92 billion worsening from financial flows and a \$42 billion improvement from valuation changes.

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