
The Dollar's Equilibrium Exchange Rate: A Market View

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In theory, a currency's value should gravitate over time toward its real long-run equilibrium value. If we were able to estimate this value, investors would be able to identify the likely path that an exchange rate will take on a long-term basis and position their portfolios accordingly. Unfortunately, there is no uniform agreement among economists either on what exchange rate level represents a currency's true long-run equilibrium value or on the method that should be used to estimate its value. For instance, the method with the widest following among economists and strategists—the purchasing power parity (PPP) approach, which equates a currency's fair value with the trend in relative price levels—is also widely recognized to have serious limitations because other fundamental forces have often played an important role in driving the long-term path of exchange rates.

The purpose of this paper is to describe how equilibrium exchange rate modeling can be useful for foreign exchange market participants. One of my principal goals is to demonstrate that equilibrium exchange rate modeling is not purely an arcane academic exercise. I begin by discussing the fundamental equilibrium exchange rate framework pioneered by John Williamson. I then survey several modeling attempts that use the FEER framework as well as others undertaken in recent years to estimate where the dollar's equilibrium value versus the euro lies.

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Most model-based estimates suggest that the dollar is significantly overvalued versus the euro. I suggest that those estimates might be understating the dollar's true equilibrium value. Specifically, I raise the following questions: Is it possible that "new economy" forces raised the dollar's equilibrium value beginning in the second half of the 1990s? If so, what level of the dollar is now consistent with long-run equilibrium? I then consider whether a portion of the dollar's rise in the second half of the 1990s might have been a disequilibrium phenomenon. One could argue that overoptimistic assessments of "new economy" forces might have caused the dollar to overshoot its fair value. In addition, the excessively wide US current account deficit that has arisen in recent years, and which the United States might soon find problematic to finance, also suggests a possible dollar overshoot.

Assuming it is agreed that the dollar is now overvalued, although not by how much, I consider what kind of adjustment in the dollar's value one should expect to help bring the dollar back into line with fair value. If "new economy" forces have indeed raised the dollar's equilibrium value, it might not have to fall by much from its present level to bring it into line with fair value. History suggests, nonetheless, that investors should be braced for the possibility that the dollar might overshoot its equilibrium level—whatever that level is—to the downside, as it has in previous cycles.

Finally, I address the question of the Japanese yen. Although some would argue that favorable external balance considerations in Japan should lift the yen's equilibrium value over time, I suggest that unfavorable internal balance considerations in Japan—specifically, its persistent economic slump and financial-sector problems—are likely to drive the yen's equilibrium value lower over time.

Market Participants and Equilibrium Exchange Rate Estimates

In practice, estimates of long-run equilibrium often vary considerably, depending on which model is used. The problem for foreign exchange market participants is to determine which of these models will yield the most reliable estimate of the dollar's equilibrium value. Consider the dilemma posed by a recent European Central Bank (ECB) working paper (Detken et al. 2002) that examined four models of the euro's equilibrium value. The study found that all four models agreed that the euro was undervalued, but the estimated magnitude of its undervaluation varied widely from model to model—from 5 percent to 27 percent. From an investor's perspective, the failure of these models to agree on what level of the euro represents long-run equilibrium could have a major bearing on how much foreign exchange risk one would be willing to undertake.

Investors who believe that the euro is only moderately undervalued might prefer to maintain a portfolio posture that is close to neutrally weighted toward the euro. Those who believe that the euro is significantly undervalued and thus has considerable upside potential might prefer to aggressively overweight the euro in their portfolios.

Because different models often yield different estimates of a currency's long-run equilibrium value, market participants are often unwilling to risk significant amounts of capital on the basis of such estimates. This is especially true for fund managers whose performances are evaluated over relatively short time spans. It is no wonder, then, that many fund managers today concentrate less of their energies on long-term equilibrium exchange rate models and more on shorter-run forecasting tools such as momentum-based trading rules and order flow, sentiment, and positioning indicators.

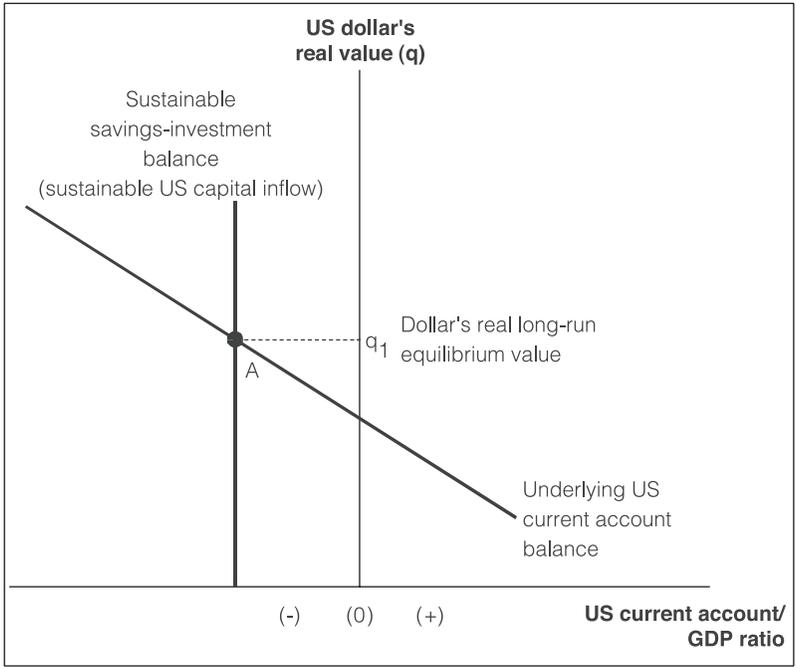
If equilibrium exchange rates are so difficult to estimate and very few investors are willing to commit capital on the basis of such estimates, one might ask why foreign exchange market participants would have any interest in such models. The answer might be that, although it is probably impossible to pinpoint where true long-run equilibrium lies, an equilibrium exchange rate modeling framework might nevertheless help investors better understand the forces that give rise to long-term cycles in exchange rates.

The dollar has exhibited a tendency both to rise and to fall over long-term cycles, and the lion's share of those cycles have been driven by upward and downward revisions in the market's assessment of the dollar's real long-run equilibrium value. Not only are exchange rate cycles long—often lasting five years or longer—but also the magnitude of the dollar's movements in each cycle has tended to be quite large. Indeed, at the end of each long exchange rate cycle, there has been a tendency for the dollar to overshoot its equilibrium value by a wide margin. Knowing that the dollar rises and falls over long-term cycles and that sustained shifts in equilibrium exchange rates are largely responsible for those long cycles, investors might profitably concentrate more of their attention on the forces that determine equilibrium exchange rates, whether their investment time horizons are short or long.

Equilibrium Exchange Rate Assessment: The FEER/IMF Approach

The failure of the PPP approach to hold over medium-term and, in some cases, long-term horizons has led economists to consider alternative approaches to assessing long-term value in the foreign exchange markets. For instance, the International Monetary Fund (IMF) (Isard et al. 2001) favors the macroeconomic balance approach to long-term exchange rate determination. In this approach, the long-run equilibrium exchange rate

Figure 2.1 The IMF's macroeconomic-balance approach to long-run exchange rate determination



Source: Adapted from Isard et al. (2001, 8).

is defined as the rate that would equalize a country's sustainable savings-investment balance with its underlying current account balance. If there is a sustained shift in a country's national savings, investment, or underlying current account, then in this model the real long-run equilibrium exchange rate should adjust accordingly. This method is quite similar to the fundamental equilibrium exchange rate (FEER) approach pioneered by John Williamson (1994), which serves as the foundation for most equilibrium exchange rate modeling efforts. In recent years, a variety of other approaches have been undertaken, such as the NATREX model and behavioral/dynamic equilibrium exchange rate models, with each offering certain advantages over the others.

Figure 2.1 illustrates how the dollar's equilibrium value is determined using the IMF's three-step exchange rate assessment approach. In step 1, a US trade equation is estimated to calculate how the US underlying current account position would typically behave in response to changes in the dollar's real value. As illustrated in the figure, the US underlying current account position (the US external payments position that would prevail if all countries operated at full employment) is shown to vary inversely with changes in the dollar's real value, q . In step 2, the US normal or sustainable domestic savings-investment imbalance is estimated. In

a global context, where capital is permitted to flow freely, domestic investment need not equal domestic savings. If domestic investment exceeds domestic savings, the imbalance can be financed by attracting capital from overseas. The critical issue is to determine how much foreign capital a country can attract on a sustained basis to finance an excess of investment over domestic savings. If it is estimated that the United States cannot attract, on a sustained basis, capital inflows that exceed, say, 2.5 percent of US GDP, then the gap between US domestic investment and domestic savings could not exceed 2.5 percent of GDP on a sustained basis. Since the gap between US domestic investment and domestic savings equals the US current account deficit, this would imply that the US current account deficit could not exceed 2.5 percent of GDP on a sustained basis as well.

Step 3 in the IMF's approach combines steps 1 and 2 to arrive at an equilibrium estimate of the dollar's value. In figure 2.1, the dollar's equilibrium value is determined at the point where the US underlying current account schedule intersects the US sustainable savings-investment gap schedule at point A. This is shown as q_1 in figure 2.1. In the IMF's framework, it is possible for the US savings-investment gap (and therefore the current account imbalance) to exceed its long-run "sustainable" level on a short-term basis or possibly even a medium-term basis as long as foreign capital can be attracted to finance the gap. Nonetheless, in the long run the savings-investment imbalance could not exceed its sustainable level, since it is presumed that there is an upper limit on a country's ability to attract foreign capital on a sustained basis. That upper limit determines where the vertical savings-investment gap schedule is positioned, where the savings-investment gap schedule and the underlying current account balance schedule will intersect, and thus what exchange rate level will represent the dollar's real long-run equilibrium level.

Using this FEER framework, a number of economists have attempted to model the dollar's equilibrium value in recent years. A recent OECD study (Koen et al. 2001) surveyed these modeling attempts, with specific emphasis on the equilibrium level of the US dollar/euro exchange rate (table 2.1). Although equilibrium estimates vary widely, with dollar/euro ratios ranging from 0.87 to 1.45, the median estimate of long-run fair value for the dollar appears to fall into the range of 1.10 to 1.20, which is broadly in line with our purchasing power parity estimates.

If these equilibrium exchange rate estimates were perceived by the investment community to be on the mark, and with the dollar hovering well below these levels, we would expect that a large number of fundamental-based investors would currently be holding significantly long-euro/short-dollar positions, since this would put them in position to profit from an expected drop in the dollar's value toward its long-run equilibrium level. But this is not what we in fact find. Rather, according to recent investor positioning surveys, most fundamental-based managers appear to be holding neutral positions in both the euro and the dollar.

Table 2.1 Selected estimates of the US dollar's medium/long-run "equilibrium" value versus the euro

Study	Key explanatory variables/model	Equilibrium exchange rate estimate (dollar/euro)
Wren-Lewis and Driver (1998)	FEER model	1.19-1.45
Borowski and Couharde (2000)	FEER model	1.23-1.31
Alberola et al. (1999)	Ratio of nontraded/traded goods prices, net foreign assets	1.26
Chinn and Alquist (2000)	M1, GDP, short-term interest rates, CPI, ratio of nontraded/traded goods prices	1.19-1.28
Lorenzen and Thygesen (2000)	Net foreign assets, R&D spending, demographics, ratio of nontraded/traded goods prices	1.17-1.24
Duval (2001)	Consumption, multifactor productivity, real long-term yield spread, ratio of nontraded/traded goods prices	1.15
Clostermann and Schnatz (2000)	Real long-term yield spread, oil price, government spending, ratio of nontraded/traded goods prices	1.13
Teiletche (2000)	Productivity, government spending, real long-term yield spread, M1, industrial production	1.09
OECD PPP estimates	GDP PPP	1.09
Gern et al. (2001)	Short-term real interest rate differential	1.03
Schulmeister (2000)	PPP for tradables	0.87
Deutsche Bank (2002)	PPP (long-run average)	1.20

M1 = the most liquid measure of money supply; CPI = Consumer Price Index; FEER = fundamental equilibrium exchange rate; PPP = purchasing power parity

Source: OECD Working Paper Number 298, June 2001 (except Deutsche Bank).

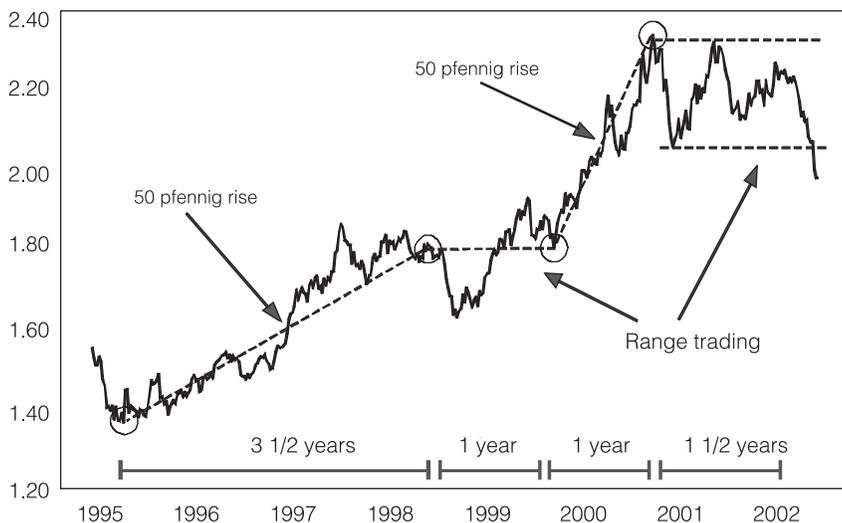
Have global fund managers become overly conservative in their investor positioning, or is it possible that market practitioners might have a less pessimistic view of the dollar's equilibrium value than the one implied by the model-based equilibrium exchange rate estimates reported in table 2.1?

"New Economy" Forces and the Dollar's Equilibrium Value

Why might market practitioners have a less pessimistic view of the dollar's equilibrium value than the one implied by most model-based estimates?

Figure 2.2 The dollar's 7-year rise vs. the deutsche mark (1995-2002)

deutsche mark/US dollars



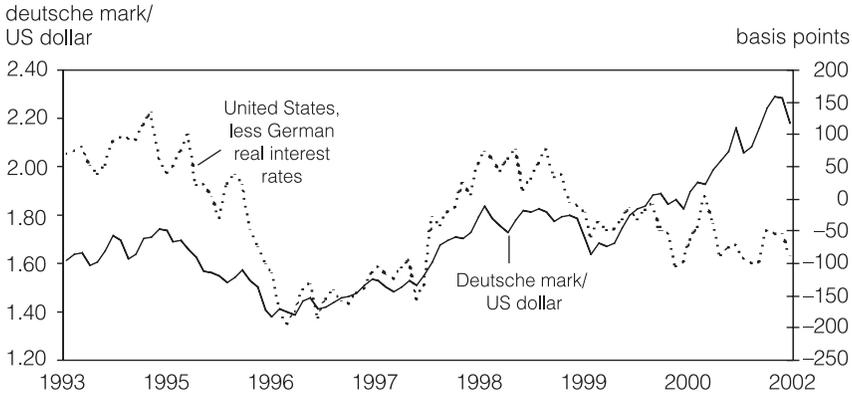
Source: Datastream.

I believe a strong case could be made that the market's assessment of the dollar's real long-run equilibrium value might have been pushed significantly higher beginning in 1999 as the marketplace embraced the notion that "new economy" forces would not only raise the speed limit at which the US economy could safely grow without igniting inflation, but might also have raised the sustainable current account deficit that the US could safely run without triggering a major downward adjustment in the dollar's value.

To fully appreciate the role that "new economy" forces might have played in influencing the market's assessment of the dollar's equilibrium value in the late 1990s, it is instructive to break down the dollar's rise over the 1995-2000 period into two phases. (Note that the euro was introduced in January of 1999, and that I use the trend in the deutsche mark/dollar exchange rate to illustrate my point.) As shown in figure 2.2, the dollar rose by 50 pfennigs in the three and a half years between the spring of 1995 and the fall of 1998, and then rose another 50 pfennigs between the fall of 1999 and the fall of 2000. (Over the intervening period between the fall of 1998 and the fall of 1999, the deutsche mark was unchanged from point to point.)

The first phase of dollar strength versus the deutsche mark, between 1995 and 1998, can be explained largely by the widening in US/German real long-term interest rate differentials that took place over that period

Figure 2.3 Deutsche mark/dollar exchange rate and US/German real interest rate differential (10-year bond yield less increase in CPI, 1993-2002)



Source: Datastream.

(figure 2.3). The second phase of dollar strength began in the fall of 1999. Note, however, that the trend in real yield spreads over the 1999-2000 period argued for a weaker, not a stronger dollar. Yet the dollar soared a full 50 pfennigs in just 12 months between the fall of 1999 and the fall of 2000. What could have caused the dollar to rise so sharply in so short a time?

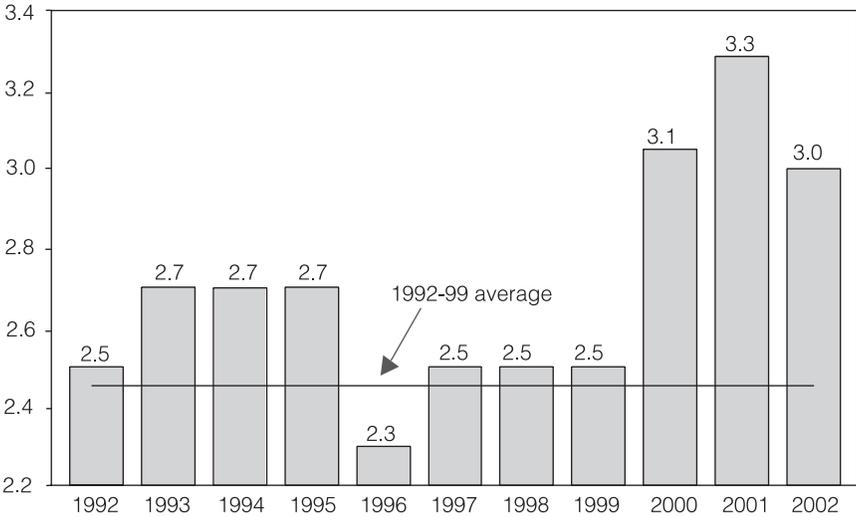
In my view, the dollar was propelled higher by an upward revision in the market's assessment of its real long-run equilibrium value during that period. This reassessment was sudden and dramatic, following closely on the heels of a sudden and dramatic upward revision in market expectations about the US economy's long-run growth prospects.

Consider the annual survey of professional forecasters conducted by the Federal Reserve Bank of Philadelphia. The survey asks professional forecasters each February: What annual rate of growth do you expect US real GDP and productivity to average over the next 10 years? The survey results are reported in figures 2.4 and 2.5. As shown, the projected average long-term US real GDP and productivity growth rates barely changed from one year to the next in the 1990s. Each year, polled economists projected that long-term US real GDP growth would average around 2.5 percent per annum, a fairly modest pace, while long-term productivity growth would average a mere 1.5 percent per annum.

Then something happened between the 1999 and 2000 surveys. Suddenly, economists raised their estimates of long-term US real GDP growth from 2.5 percent per annum to over 3 percent, and at the same time raised their estimates of long-term US productivity growth from a bland 1.5 percent per annum to a brisk 2.5 percent. Normally, one would have expected any changes in the US long-term growth outlook to have taken place gradually over a number of years, not suddenly. But in 1999-2000,

Figure 2.4 Long-term expectation of US real GDP growth

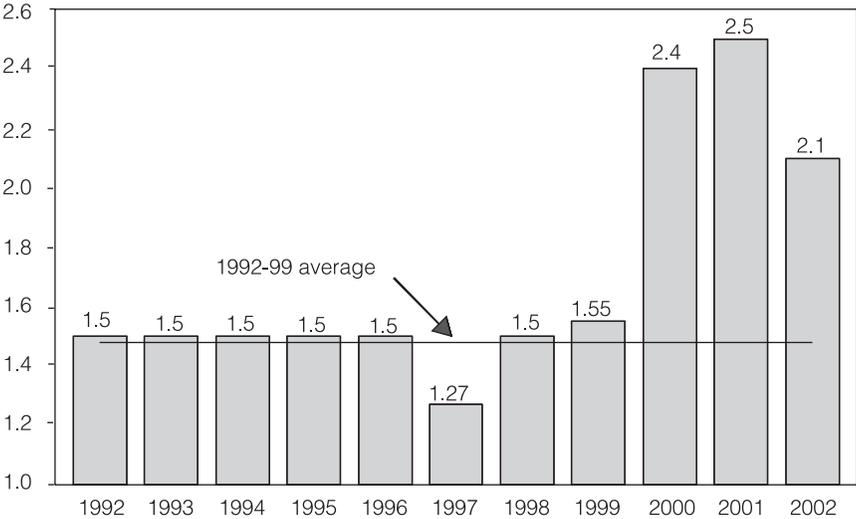
expected 10-year growth rate (percent)



Source: Federal Reserve Bank of Philadelphia, Business Outlook Survey, February 2002.

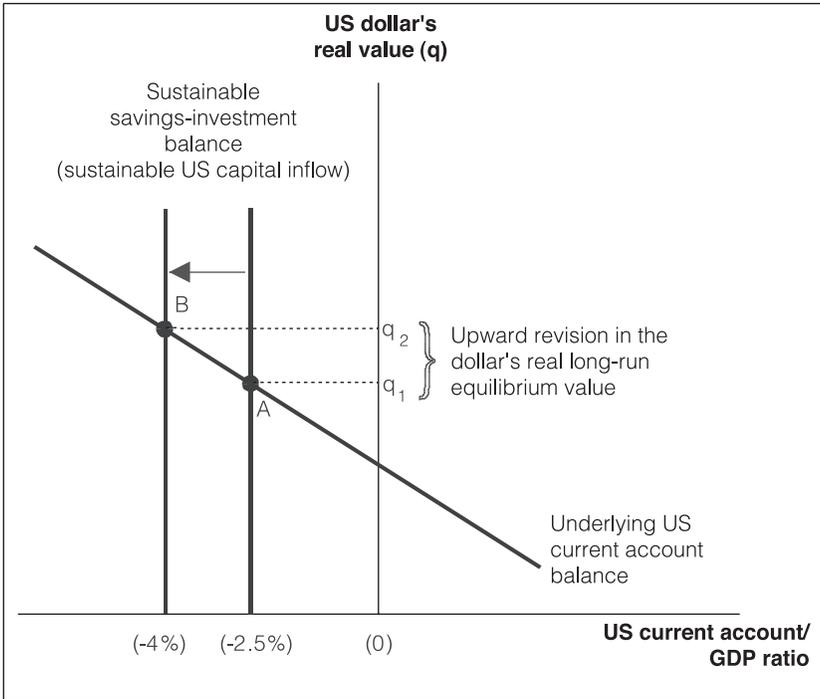
Figure 2.5 Long-term expectation of US productivity

expected 10-year growth rate (percent)



Source: Federal Reserve Bank of Philadelphia, Business Outlook Survey, February 2002.

Figure 2.6 “New economy” forces and the rise in the US sustainable current account deficit



Source: Adapted from Isard et al. (2001).

it appears that expectations about long-term growth prospects in the US not only soared, but that the change occurred virtually overnight.

The US economy had been growing faster than the Euroland and Japanese economies over much of the 1990s. According to the Philadelphia Fed survey results, though, it was not until very late in the decade that economists and market participants began to take notice of something special occurring in the US that might distance the American economy from the rest of the world on a sustained basis. The US economy was undergoing a major investment boom in both absolute terms and relative to the rest of the world in the 1990s, with most of the investment boom concentrated in the information technology (IT) arena, where US industry held a dominant global position. The IT-led investment boom, in turn, contributed to the surge in US productivity growth that began in the second half of the 1990s. Based on the Philadelphia Fed’s survey results, the initial gains in US productivity growth were probably viewed as transitory, but by the end of the decade, they were expected to be permanent.

In my view, the upward-adjusted long-term growth and investment outlook compelled the market to revise sharply upward its estimate of the dollar’s real long-run equilibrium level in 1999-2000. Figure 2.6 illus-

trates how the IT-led investment boom might have raised the dollar's real long-run equilibrium value. The figure is similar to figure 2.1 but assumes that the late 1990s surge in US investment spending led market participants to expect a permanently wider gap—say 4 percent of GDP—between US investment and US savings than the 2.5 percent gap that might have previously been the case. A permanently wider gap between US investment and savings would give rise to a leftward shift in the US savings-investment balance schedule, which would then intersect the underlying US current account balance schedule at point *B* in figure 2.6, resulting in an upward revision in the dollar's equilibrium value from q_1 to q_2 .

A permanently wider gap between US investment and savings would be possible only if the US were able to attract additional capital from abroad on a sustained basis. A sustained increase in capital inflows would be possible only if the rate of return on US assets were sufficiently attractive to induce foreign savings to move offshore and into the United States on a permanent or semipermanent basis. If the United States could suddenly attract greater capital inflows on a sustained basis, it could then more easily finance a larger current account deficit on a sustained basis.

How large the sustainable current account deficit might now be is anyone's guess, but if the long-term trend in US productivity growth has risen from 1.5 percent per annum to roughly 2.5 percent, then perhaps the sustainable current account deficit that the United States could now safely run might have risen from 2.5 percent of GDP to 3.5 to 4 percent of GDP. This possibility is illustrated in figure 2.6, where the boom in US investment spending is shown to have contributed not only to a rise in the dollar's equilibrium value, but also to a rise in the sustainable current account deficit that the United States could now safely run.

Was the Dollar's Rise in 1999-2000 Entirely an Equilibrium Phenomenon?

The dollar was not the only financial asset that soared in value over the 1999-2000 period. The marketplace's embrace of "new economy" notions also helped propel US equity values to unprecedented heights. Indeed, the NASDAQ index tripled in value between the fourth quarter of 1998 and the first quarter of 2000. With the benefit of hindsight, it is clear that a large part of the surge in the NASDAQ index was a bubble phenomenon that has subsequently reversed. However, much of the dollar's gain over that same period remains essentially intact. Does this imply that the dollar's rise was largely an equilibrium phenomenon? From my perspective, although a significant portion of the rise probably was, a certain

portion of it was also probably a disequilibrium phenomenon that will eventually need to be reversed. Several factors lead me to this conclusion.

First, although a large part of the rise in US investment spending in the second half of the 1990s was productive, there was probably also a considerable amount that should be deemed excessive, particularly during the height of the IT bubble period. Anecdotal evidence suggests that investment spending was especially excessive in the Internet and telecom sectors. This might have contributed to an unsustainable leftward shift of the US savings-investment balance schedule beyond the leftwardly shifted savings-investment balance schedule depicted in figure 2.6. US investment has indeed turned down sharply since its peak pace in 2000, so a decline in the dollar's equilibrium value should be expected, assuming the decline in investment is sustained. In figure 2.6, the savings-investment balance schedule should shift back to the right, with a concurrent downward move in the dollar's value toward its upwardly revised real long-run equilibrium level, q_2 .

Second, even if one were to embrace the idea that the recent gains in US productivity will prove sustainable, a case could still be made that a portion of the dollar's rising trend was not an equilibrium phenomenon. The reason is that the US productivity gains registered during the second half of the 1990s were not evenly distributed across all sectors of the economy. A recent McKinsey & Company study (2001) found that only six of the leading 59 sectors of the US economy, representing 28 percent of US real GDP, contributed to the 1995-2000 productivity gains. These sectors were heavy users of new technologies. The other 53 sectors, representing 72 percent of US real GDP, contributed virtually nothing to the productivity gains of that period.

It appears that the gains in productivity registered by the 28 percent that invested heavily in new technologies were so great that they were able to boost the aggregate productivity performance of the entire US economy in 1995-2000. That, in turn, helped drive the dollar higher over that period. For the 28 percent of the US economy that enjoyed strong productivity gains, the dollar's rise has not seriously dented their overall competitiveness, since the positive effect of strong productivity gains has helped offset the negative effect of a rising dollar. However, the other 72 percent of the US economy must now struggle to compete in world markets with an overvalued exchange rate and without an offsetting gain in productivity. That would explain why a large number of US firms are now loudly complaining that the dollar's strength is undermining their long-run competitiveness. If a small but dynamic sector of the US economy is largely responsible for the dollar's gains, then a case could be made that the dollar's value is currently too high for a large segment of the economy and that a weaker dollar might therefore be warranted.

Third, although one could argue that "new economy" forces might have raised the size of the sustainable US current account deficit, that

does not mean that the United States can now run any size deficit that it wishes. If, for example, the sustainable US current account deficit limit has risen from, say, 2.5 percent of GDP to 3.5 to 4.0 percent of GDP, then a deficit that exceeded this revised limit would have to be eliminated. Data for the second quarter of 2002 indicate that the US current account deficit as a percentage of GDP widened to a new record of 5 percent, and it is highly unlikely that a deficit of this magnitude will prove sustainable. According to studies by Catherine Mann (1999) and Caroline Freund (2000), current account deficits that have reached a threshold of over 4 percent of GDP have tended to set corrective forces in motion—including corrective currency adjustments. With the US now having passed this threshold, the dollar would thus appear to be in a vulnerable position.

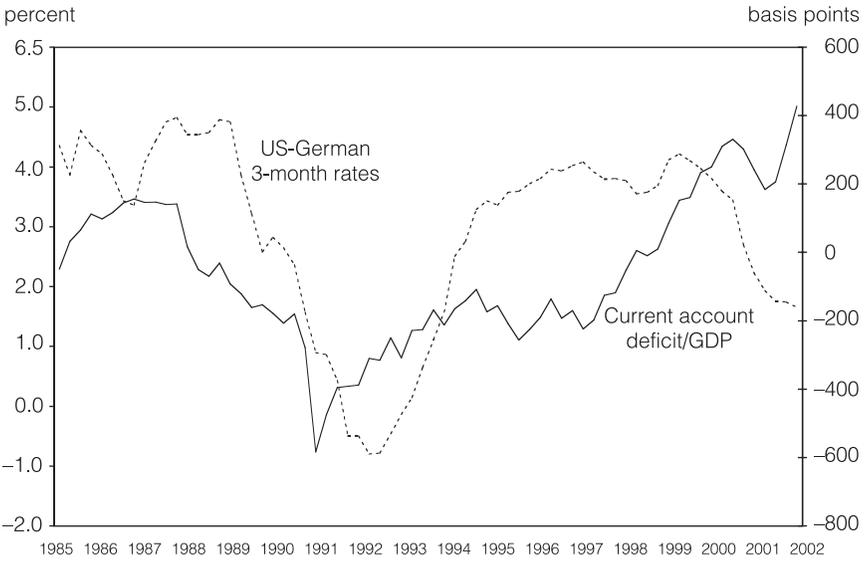
The major problem facing the US at the present time is that in order to finance its record shortfall in the last year, the US has had to absorb 70 percent of world net foreign savings, according to the IMF's September 2002 Global Financial Stability Report. It is unlikely, however, that the United States will be able to have free access to such a large share of world net savings indefinitely. If growth prospects elsewhere in the world pick up, the United States will likely have to make do with a smaller share.

At present, the United States is actually in a rather weak position to attract the needed capital inflows to finance its current account deficit. Normally, when a country runs a larger current account deficit, it often must push interest rates higher to attract the necessary capital from abroad to finance its current account imbalance. One would therefore expect a country's current account shortfall to move roughly in line with domestic-foreign yield spreads, with larger deficits associated with wider domestic-foreign yield spreads and vice versa.

Indeed, that has been the case for the United States over much of the past 15 to 20 years (figure 2.7). But in the past three years or so, something has gone awry with this relationship. At the same time that the US current account deficit widened to record levels in the 1999-2002 period, US-foreign yield spreads have actually narrowed, and quite appreciably so. What this indicates is that the United States did not have to go out of its way to attract the necessary capital to finance the record surge in its current account deficit. Instead, it was able to finance its record shortfall with huge net inflows into the US equity market (figure 2.8), surging net foreign direct investment inflows (figure 2.9), and capital flight from emerging markets (figure 2.10). As figures 2.8 to 2.10 indicate, however, these sources of capital now appear to be drying up. With the current account deficit still widening, the dollar's vulnerability clearly has risen, especially given the fact that the trend in US-foreign yield spreads is moving in a direction that will discourage capital flows into the United States.

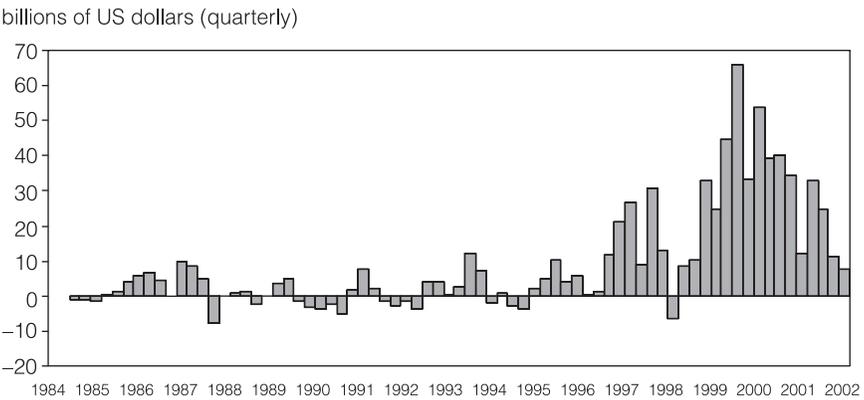
Fourth and finally, although it is true that professional forecasters did revise significantly upward their long-term projections of US GDP and

Figure 2.7 US current account deficit and the US/German short-term interest rate spread



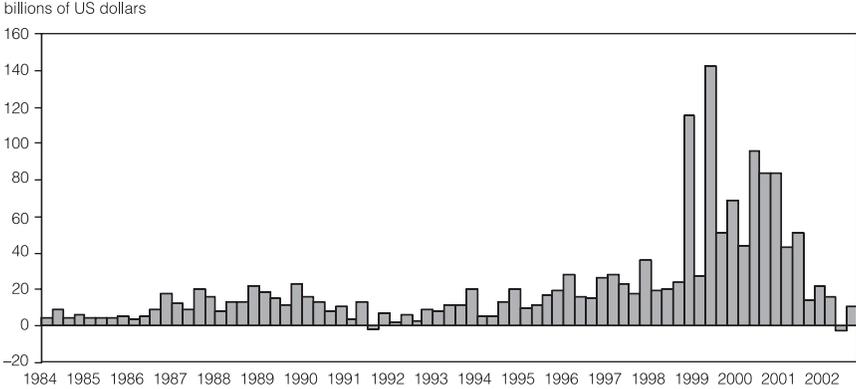
Source: Datastream.

Figure 2.8 Net foreign purchases of US equities



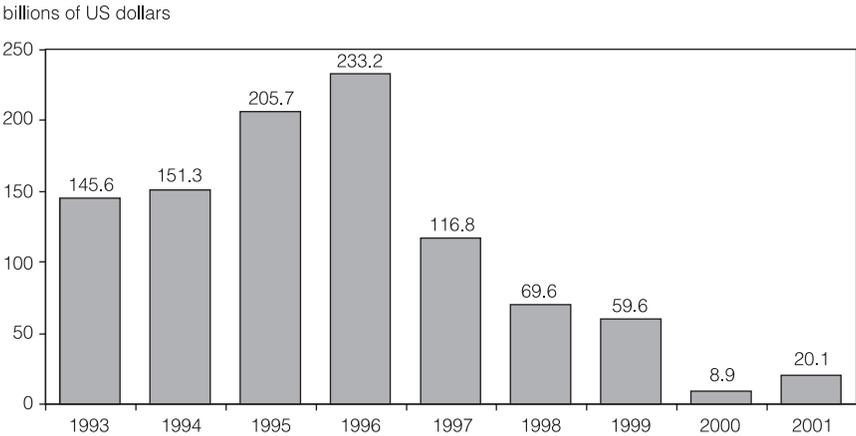
Source: Datastream.

Figure 2.9 Net foreign direct investment in the United States



Source: Datastream.

Figure 2.10 Capital flows into emerging markets (net private capital flows)



Source: IMF *World Economic Outlook* December 2001.

productivity growth, which was deemed to be positive for the dollar on a longer-term basis, a careful reading of figures 2.4 and 2.5 above indicates that professional forecasters did scale back their long-term projections for both US GDP growth and productivity in the most recent (2002) survey. To the extent that the dollar's equilibrium value was pushed higher by upbeat estimates of long-term US economic growth prospects, one would expect that a less upbeat projection of long-run US growth prospects should be accompanied by a downward revision in the dollar's equilibrium value. If long-run US growth prospects are scaled back further in

the 2003 survey, which seems likely, then a further downward adjustment of the dollar would be called for.

How Far Can the Dollar Actually Fall?

Summing up my thoughts so far, it appears to me that a sizable portion of the dollar's rise was an equilibrium phenomenon brought about by "new economy" forces but that an equally sizable portion might have been a disequilibrium phenomenon caused by an excessive increase in US investment spending that is now being reversed. In addition, the outsized US current account shortfall might not be easily financed in the future, particularly with US-foreign yield spreads moving in a direction that will discourage capital inflows. Furthermore, the sharp rise in the dollar's value might have made a large segment of the US economy less competitive. Finally, overly optimistic long-term forecasts of US GDP and productivity growth now appear to be in the process of being scaled back.

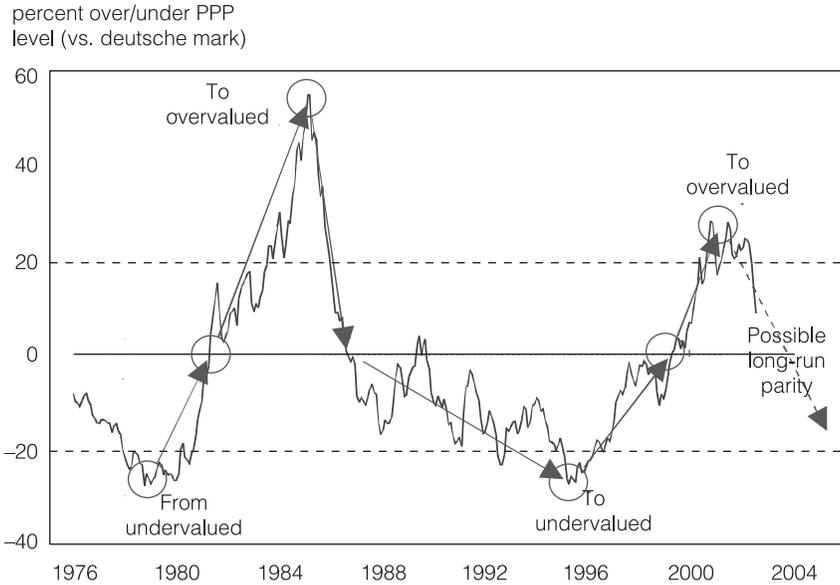
This then raises the question of just how far the dollar will need to fall from present levels to bring it back into line with its long-run fair value. The answer largely depends on what one assumes the long-run sustainable US current account deficit to be. If the ratio of the sustainable US current account deficit to GDP is 2.5 percent and the US current account shortfall is 5 percent of GDP, then a sizable decline in the dollar's value from present levels will be required to bring the actual deficit in line with its long-run sustainable level. If the sustainable current account shortfall were closer to the range of 3.5 to 4 percent of GDP, then only a modest decline in the dollar would be required.

According to the Federal Reserve Board's econometric model, a sustained 10 percent drop in the dollar's trade-weighted value over the next two years should boost US exports by roughly 9 percent and cut imports by roughly 6.5 percent to 7 percent. That should be enough to reduce the US current account deficit by roughly 1 percent of GDP, which would then bring it in line with a target range of 3.5 to 4 percent of GDP. However, the trade-weighted dollar would need to fall by about 25 percent from present levels to satisfy a 2.5 percent of GDP target.

Assuming agreement that the dollar must fall in the future, how certain are we that the decline will stop once the dollar hits its estimated long-run equilibrium level? History would suggest that once the dollar begins to decline in earnest, there is a very good chance that it will overshoot its fair value (whatever that level is) to the downside.

Historically, the dollar has exhibited a tendency to rise and fall over long-term cycles, with each cycle lasting for five years or longer. Dollar cycles often begin from a point of significant overvaluation or undervaluation on a PPP basis. From those maximum over- or undervalued levels, the dollar typically enters a first phase of adjustment by falling or rising

Figure 2.11 US dollar purchasing power parity (Deutsche Bank PPP estimates based on 1982-2000 averages)



Note: The zero line represents the long-run equilibrium level of PPP.

Source: Datastream, Deutsche Bank estimates.

to correct the initial misalignment. But market forces seldom stop driving the dollar lower or higher once PPP has been restored. Rather, the dollar often enters a second phase in which the marketplace drives the dollar well beyond its estimated PPP value, and in the process creates a new and rather large PPP misalignment with the opposite sign of the dollar's initial misalignment. This process then repeats itself over succeeding cycles.

Figure 2.11 illustrates the dollar's pattern of long cycles followed by PPP misalignment over the past 25 years. As shown, the dollar became highly undervalued (by more than -20 percent versus the deutsche mark) in the late 1970s, and then rose dramatically in the first half of the 1980s until it became grossly overvalued in 1984-85. The dollar then fell steadily between 1985 and 1995, at which point it became highly undervalued again. The dollar then rose sharply between 1995 and 2000, until it once again became significantly overvalued.

From this perspective, the dollar appears to have entered a new down cycle in the past two years that—if the five-year-plus pattern of cycles continues—will carry forward to at least 2005. A fall in the dollar to its estimated PPP value would take it to a dollar/euro range of 1.15 to 1.20. The dollar's true long-run equilibrium level might be higher or lower than this, depending on whether one assumes the long-run sustainable current account deficit is closer to 2.5 percent or 3.5 to 4 percent of GDP.

The risk suggested by figure 2.11 is that the dollar could easily overshoot to the downside in the next few years to levels well beyond our PPP estimates, if the dollar's tendency to move in long-term cycles and overshoot its fair value at turning points persists.

Whither the Yen?

While I am comfortable with the idea that the dollar should weaken on a trend basis versus the euro, I believe the dollar will take an entirely different path versus the yen. The yen can be a frustrating exchange rate to forecast even during the best of times. But it is likely to prove particularly frustrating in the coming years, because the underlying trends on the internal and external balance fronts in the United States and Japan have diverged so greatly.

Exchange rates are normally determined by the joint interaction of internal and external balance forces, but determining where equilibrium lies can be a problem if one country is suffering a serious deterioration on its external balance front while the other country is suffering a serious deterioration on its internal balance front. The key question for forecasters is how to weigh such conflicting trends to come up with an estimate of a currency's equilibrium value.

This is clearly the dilemma faced by investors today when analyzing the fundamental forces driving the yen versus the dollar. For example, Japan's economy has been suffering from a serious internal balance problem for over a decade. Moreover, there are significant risks that this problem could become even more serious if global economic activity slows significantly and world equity markets continue to slide. A slowdown in global growth could undermine Japan's export-led recovery, while weaker equity prices could lead to a further deterioration in Japanese banks' balance sheets. If that happens, bank lending would be constrained further and a financial bailout of the Japanese banking system might need to be considered. Under such a scenario, the Bank of Japan would come under greater pressure to step up its quantitative easing of monetary policy, which would in all likelihood contribute to a significant weakening of the yen.

From a longer-run perspective, Japan faces a number of serious internal balance problems. These include the following:

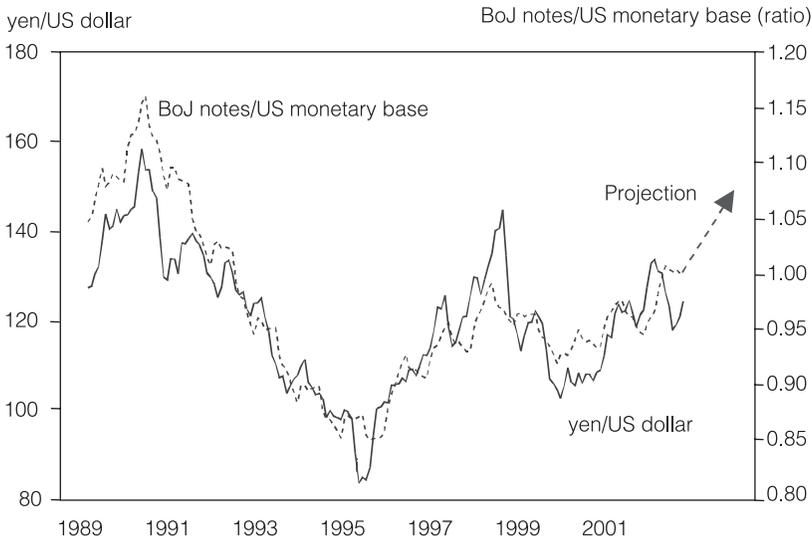
1. Japan has been in a decade-long slump that is displaying no sign of reversing.
2. Japan's standing in global competitiveness surveys has been slipping steadily in recent years.

3. S&P, Moody's, and Fitch have issued a series of ratings downgrades on Japanese government debt.
4. Capital spending has been persistently weak, which has led to a sustained decline in Japanese productivity growth.
5. Bankruptcies are running at record levels.
6. Bank lending has contracted in each of the past four years.
7. Banks' nonperforming and problem loans have grown steadily in recent years and are now estimated to be around ¥150 trillion, roughly 30 percent of GDP.
8. The financial health of the Japanese government's Fiscal Investment and Loan Program (FILP) has been called into question (a recent NBER study [Doi and Hoshi 2002] suggests that "as much as 75 percent of the FILP loans are bad" and estimates that losses could amount to roughly ¥80 trillion, or 16 percent of GDP).
9. Japan's huge budget deficit and gross government debt as a percentage of GDP will place limits on the ability of policymakers to stimulate growth in the future through fiscal channels.

In addition, with deflationary expectations so deep-seated, the IMF indicated in its latest annual assessment of Japan that the Bank of Japan needs to do more on the quantitative easing front. According to the IMF's monetary model of the Japanese economy, a 25 percent increase in Japan's monetary base should boost consumer prices by 1.0 percent. Although Japan's monetary base is currently rising at a 25 percent year-over-year pace, that may not be sufficient if underlying deflationary forces are pushing Japan's consumer price index down by more than 1 percent per annum. The IMF noted that, on the basis of lessons learned from past deflationary episodes in other industrialized countries, Japanese monetary base growth might need to rise far more rapidly to push the rate of change in Japan's consumer price index into positive territory on a sustained basis. If the Bank of Japan does indeed move in this direction, one should expect that a policy shift of this magnitude would exert considerable downward pressure on the yen's value (figure 2.12), as has been the case in all other countries where monetary easing has been undertaken in earnest.

With Japan's government debt dynamics on an unsustainable path, it is highly likely that Japan will need to engineer a long-run fiscal consolidation effort to bring its deficits under control. Using the FEER framework depicted in figure 2.1, Japan's savings-investment balance schedule appears

Figure 2.12 The yen and Japanese/US monetary policies
(using BoJ notes in circulation series)



Note: 6-month moving averages of year 2000 adjusted monetary-base series.

Source: Datastream.

destined to shift sharply to the right for a long time to come, which will be yen negative. Combining this with the monetary policy path that the Bank of Japan looks set to pursue, the long-term policy mix in Japan is likely to be one of significant fiscal restraint coupled with monetary ease. The Mundell-Fleming model would argue that such a policy mix is a recipe for a long-term decline in a currency's value (figure 2.13).

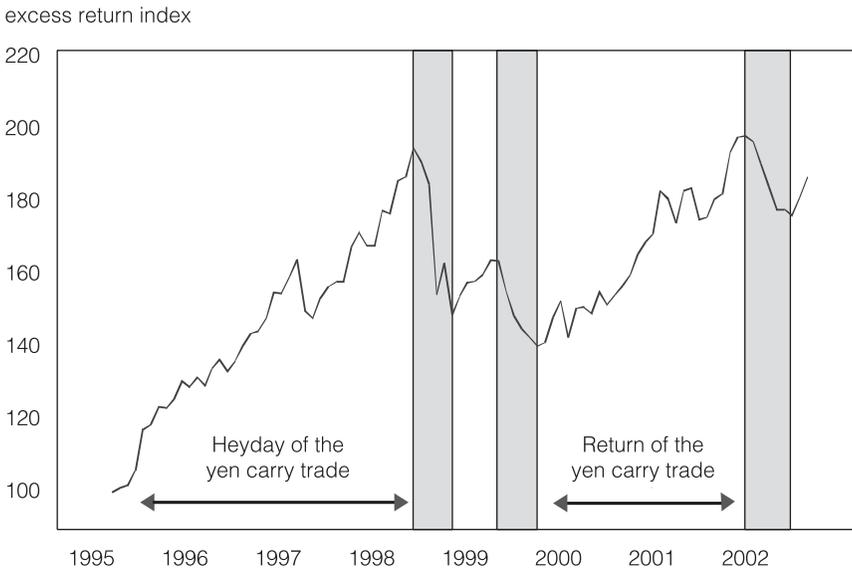
In fact, the yen has been underperforming the dollar for the past seven and a half years. As shown in figure 2.14, long-dollar positions have significantly outperformed long-yen positions since the spring of 1995. The cumulative excess return (currency returns plus positive carry) from being long-dollar/short-yen between April 1995 and October 2002 is a fairly hefty 85 percent. There were a number of instances when holding on to a long-dollar/short-yen position proved costly—such as the fall of 1998, the summer of 1999, and the spring and summer of 2002—but from a longer-run standpoint, one would have earned far more by being long the dollar than long the yen over the past seven and a half years.

Looking ahead, I am optimistic that the long-run trend of dollar outperformance versus the yen will remain intact. Japan's internal balance problems are unlikely to improve for a long time to come and may indeed worsen. I believe that Japan's deep-seated internal balance problems will more than offset any positives that might emerge on Japan's external balance front.

Figure 2.13 The monetary/fiscal policy mix and the determination of exchange rates

	Expansionary monetary policy	Restrictive monetary policy
Expansionary fiscal policy	Ambiguous	Domestic currency appreciates
Restrictive fiscal policy	Domestic currency depreciates	Ambiguous

Figure 2.14 Excess return on long-dollar/short-yen positions (since April 1995)



Source: Datastream, Deutsche Bank estimates.

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