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The Impact of US External Adjustment on Japan

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In the late 1990s the United States entered once again into a period of large external current account deficits. By 2000 the deficit reached $410 billion, or 4.2 percent of GDP. This was even higher than the previous peak of 3.4 percent in 1987, at the end of a period when the overvaluation of the dollar and the external deficit were considered a sufficient threat to international economic stability that the G-7 had undertaken coordinated intervention beginning in 1985 to bring the dollar down from its high level.[1] In contrast, this time around US policy has been nonchalant about, or even welcoming of, the strong dollar and the large external deficit. In part this stance has reflected recognition that external resources were useful for meeting buoyant domestic demand without inflation in the late 1990s. In part it has reflected the policy view, especially in the Clinton administration, that a strong dollar is good for the US economy. Acceptance of large external deficits has also reflected recognition that in the late 1990s the US economy was providing a vital role as locomotive for the global economy, especially in view of weakness in Japan and emerging markets. Finally, in contrast to the 1980s, this time the draw on foreign resources has been associated with a boom in private domestic investment

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1. The US external deficit tends to respond to the exchange rate with a two-year lag (Cline 1989).

and consumption that overshadowed a move into fiscal surplus, and the absence of fiscal imbalance likely helped to depict the external imbalance as benign.

The premise of this conference, however, is that the large and potentially widening external deficit poses risks for the US economy, and that prudence requires thinking not only about what measures could narrow the deficit but also about what the ramifications will be for other key economies when adjustment does take place. One reason there is a limit to the external deficit is that there is a limit to the share of global capital flows and corresponding shares in foreigners' portfolios that the United States can plausibly command (Mann 2002). Another reason is that there is presumably a limit to the extent to which current policymakers should saddle future generations with external debt, defined broadly to refer to net liabilities in loans and bonds, portfolio equities, and direct investment. A third and related reason is the potential for a disruptive break in the dollar if the large external deficits and net liability buildup continue—a hard-landing scenario worth considering even if the 1980s fears of such an outcome proved exaggerated (Marris 1985). A fourth reason is that the strong dollar and the external deficit pose special problems for US manufacturing and agriculture, raising questions of long-term inefficiencies from distorted price signals for sectoral allocation of investment (even if macroeconomic policy can compensate in nontradable sectors to maintain full employment).

For all these reasons, it would seem reasonable to set as a goal of policy that the external deficit be curbed enough to stabilize the ratio of net external liabilities to GDP. It turns out that this target implies an aggressive reduction in the current account deficit. The US adjustment, in turn, implies that foreign trading partners will be faced with falling current account surpluses or rising current account deficits as the mirror image of the US deficit reduction. In this paper I examine the implications of this counterpart foreign adjustment for the case of Japan.

A focus on Japan is warranted for two principal reasons. First, as the largest surplus economy in terms of both current account and net international assets, Japan seems likely to be faced with picking up a major share of the surplus-reduction counterpart of the US deficit reduction. Second, because Japan's economy has been in extended stagnation or recession in recent years, there are reasons for concern about the impact on Japan's growth. A reduction in Japan's surplus resulting from a decline in exports and rise in imports unaccompanied by a rise in domestic demand would push the Japanese economy further into recession.

In this paper I first gauge the likely magnitudes of the US and Japanese external adjustments. I then consider the implications for Japanese economic performance and for the appropriate international policy approach to Japan's role in the global adjustment. First, however, it is necessary

to review briefly the delicate position in which the Japanese economy currently stands.

The Japanese Economy at Risk

The prolonged weakness of the Japanese economy since the early 1990s has been examined in detail (see, e.g., Posen 1998 and Ahearne et al. 2002). There is a wide consensus about some of the causes, including collapse of the early 1990s asset price bubble, subsequent plunge in investment, failure to restore strength to the banking sector, and foreign pressures as the East Asian crisis affected a prime export market. There has been ample room for debate, however, on the proper policy remedies. As Japan has entered into deflation, and as nominal interest rates have approached zero, it could be argued that the conditions have come to resemble those of the Great Depression (Krugman 1998). Hence, some of the principles of Keynesian analysis might be thought to apply, including inefficacy of monetary policy and the need to adopt fiscal expansion to get the economy moving. At the same time, however, weak revenue and recurrent rounds of fiscal stimulus have brought a sharp escalation in the ratio of public debt to GDP, which from 1992 to 1999 rose from 65 percent to 120 percent in gross terms and from 40 percent to 85 percent on a net basis, excluding social security system assets (but also excluding potential liabilities from loan guarantees and bank support; International Monetary Fund 2001, 91).[2] This in turn has raised doubts about further fiscal expansionary measures, contributing to increased interest by many analysts in seeking further monetary expansion.[3]

The usual industrialized country policy dilemma of the 1970s and 1980s was the problem of stagflation: recessions triggered by oil shocks (for example) could not be easily addressed through monetary and fiscal expansion without risk of aggravating inflation. Japan has recently faced a different kind of policy dilemma, in which the fiscal stimulus desirable for recovery heightens uncertainty because of the public solvency concern, while policymakers are doubtful about monetary stimulus both because of the absence of the normal interest rate transmission mechanism and, apparently, a classic central-banker fear that too much monetary expansion could bring back excessive inflation.

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2. In principle the net basis is more meaningful for fiscal solvency, but it is unclear to what extent the assets deducted in the Japanese public accounting are economically meaningful.

3. The usual manifestation of monetary ease, lower interest rates, would not result, as these are already close to zero, but several analysts consider that a firm commitment to expand the monetary base by central bank purchases of government bonds would bring about expectations of a return to mild inflation, in turn reversing the depressing effect of deflationary expectations on current consumption.

Whatever the merits of the official views and those of critics, there is little doubt that economic policy in Japan has faced and continues to face a quandary in which no solutions appear obvious and without risk. A resulting paralysis in macroeconomic policy has been accompanied by lethargic reform of the banking sector. As a result, despite repeated announcements of new forceful action, the ratio of nonperforming loans to bank capital (including unrealized capital gains) has continued to escalate from 69.3 percent in March 1999 to 146.9 percent in March 2002 (Bank of Japan 2002b). The plunge of the Nikkei 225 stock index (from 11,025 at the end of March 2002 to 9,619 at the end of August; Bank of Japan 2002b) has aggravated this weakness by virtually eliminating unrealized capital gains on the banking system's large holdings of equities. Indeed, the most recent, and perhaps most dramatic, manifestation of the dire condition of the Japanese economy is the decision of the Bank of Japan to purchase stocks held by Japanese banks to help ensure that their disposal of stocks does not further depress the stock market and push them below, or further below, international capital requirements.[4]

This brief review is intended simply to sharpen the context for this study by highlighting the serious challenges and uncertainties facing the Japanese economy and its policymakers. No remedy will be suggested here, but these circumstances do mean that at least the timing of the Japanese response to the US external correction should be such as to avoid, as far as possible, tipping the economy further into recession.

Finally, two additional points are warranted to provide perspective. First, the Japanese economy in the 1990s has disappointed primarily because of its sharp slowdown from excellent performance in previous decades. In absolute terms, the performance looks less devastating. Thus, between the decades 1980-90 and 1990-2000, growth of real GDP relative to available labor force accelerated from 1.7 percent to 2.2 percent in the United States but plunged from 2.8 percent to 0.6 percent in Japan.[5] Even so, Japan was only slightly behind the pace for Italy (0.8 percent in the 1990s), although significantly lower than the average for Germany and

4. Although unprecedented in the industrialized countries, central bank stock purchases from the market have a precedent in Hong Kong's monetary authority purchases in the late 1990s, although these were not from banks. Japan's proposal amounts to a specific way to increase the money supply that at the same time helps avoid further weakening of the banking system. The implicit potential subsidy to the banks, if the stock market falls further, is equivalent to a public-sector bailout, something the political system has been unprepared to do by the direct route of legislated subsidies. The usual inflationary risk of using central bank financing to support a weak banking system, instead of appropriated government expenditures, is absent in this case because the problem is not inflation but deflation.

5. This is perhaps the best gauge of economic performance. GDP growth alone does not reflect the fact that some countries have rapidly growing labor and others do not. Productivity per worker is not a satisfactory gauge because it considers only the employed.

France (1.4 percent).[6] Nonetheless, Japan's fall from the top to the bottom of the industrialized country growth league poses special concerns because of its large economic size and its important role in the market for exports from Asian emerging market economies in particular.

Second, it is worth underscoring that the by now long-standing failure of macroeconomic adjustment in Japan is centered on the proven inability to replace foreign demand with sustained growth in domestic demand as the engine of economic expansion. Thus, from 1990 to 2000, real domestic private consumption expanded by an amount equivalent to only 9 percent of 1990 real GDP (calculated from Economic and Social Research Institute 2002). Real gross private investment was actually lower at the end of the decade than at the beginning, falling by 5.6 percent, an amount equivalent to 1.4 percent of 1990 real GDP. In contrast, real net exports rose over this period by 114 percent, or by an amount equal to 1.5 percent of 1990 real GDP. As the United States enters into external adjustment, Japan will find it increasingly difficult to rely on foreign demand as the source of growth.

Relative Productivity Growth: Deus ex Machina?

Finally, before turning to the main estimates of this paper, it is important to consider the argument that the US external deficit can be justified by a rise in the gap between the rate of productivity growth in the United States and that abroad. Some have argued that the fundamental equilibrium exchange rate for the dollar has risen because of the rise in relative US productivity growth (see Michael Rosenberg's paper in this volume). Similarly, US officials have recently tended to cast doubt on the importance of a large deficit on the grounds that it reflects investment inflow in response to opportunities arising from more rapid productivity growth.[7]

While it is true in principle that increased relative productivity growth and hence relative return to capital should imply a period of increased capital inflows and thus larger current account deficits, there are several reasons to be skeptical that this argument justifies US external deficits on the current scale. First, it is no longer true that the deficit is mainly financing investment. The US investment boom of 1997-2000 has given way to an investment bust, yet the current account deficit has continued

6. Calculated from World Bank (2002, 2001).

7. In contrast, the International Monetary Fund (2002c) has become increasingly emphatic in raising concerns about the risks posed by the rising US current account deficit.

to rise.[8] Second, the productivity-gap argument implicitly requires a permanent relative shift, yet historically there have been alternating periods of rising and falling US productivity growth relative to Europe and Japan, and there is no assurance that the recent gap will persist. Third, the magnitudes involved are incommensurate. Few would argue that the gap between annual US productivity growth and that in Europe in particular has risen by more than, say, one percentage point. Yet if the net foreign liability position is to stabilize at about 25 percent of GDP for the United States, then an extra percentage point of growth warrants an increase of only 0.25 percent of GDP in the sustainable current account deficit—not an increase of some 3 to 4 percentage points, as has actually occurred since the early 1990s.[9]

Fourth, the classic economic argument on the issue is the ''Balassa-Samuelson effect,'' whereby an increase in productivity growth of the export sector leads to a real appreciation of the exchange rate (Balassa 1964). But in this effect, the sequencing is the reverse: the increase in productivity growth first leads to a surge in exports and a rise in the trade surplus, which in turn bids up the currency. Recent US experience has been just the opposite, as the capital market has bid up the dollar despite a widening trade deficit. In sum, to the extent that rising US relative productivity growth has played a role, there are good reasons to think that the capital market has caused a temporary overshooting of both the real value of the dollar and the size of the US current account deficit beyond longer-term sustainable levels. Indeed, the ''new economy'' productivity argument helped disguise the unsustainability of what turned out to be a bubble in the US stock market, and the same argument may well have done the same thing for the dollar and the US current account deficit.

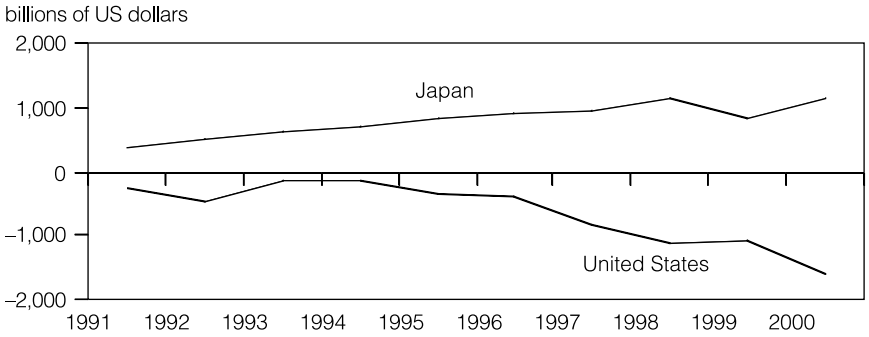
Gauging the US External Adjustment Task

Undertaking the objective of stabilizing the ratio of US net foreign liabilities to GDP would mean seeking to halt what has been a sharp rise over the past decade. At the end of 2001, gross US foreign assets stood at $6.86 trillion and gross foreign liabilities at $9.17 trillion, leaving the net liability position at $2.31 trillion, or 22.9 percent of GDP (Bureau of Economic Analysis 2002a, 2002b). This represents a major escalation from net foreign liabilities of only 4.4 percent of GDP in 1991. Correspondingly, at the end

8. From 1991 to 2000, private fixed investment rose from 13.4 percent of GDP to 17.9 percent. The rate fell to 15.7 percent in 2001, however, and to 15.2 percent in the first half of 2002 (Bureau of Economic Analysis 2002b).

9. The relationship between the ceiling current account deficit and the target net liability position relative to GDP is discussed below.

Figure 9.1 Net foreign asset position, 1991-2000



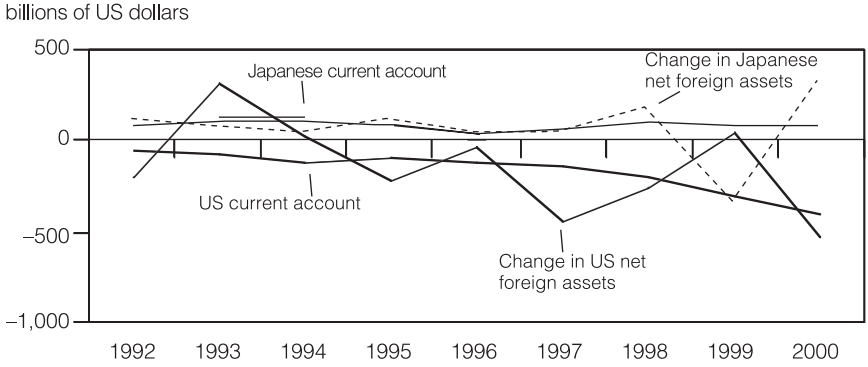
Sources: IMF (2002a); BEA (2002a).

of 2000, Japan's gross foreign assets stood at $3.0 trillion and gross foreign liabilities at $1.8 trillion, for a net international asset position of $1.2 trillion, or 24.3 percent of GDP (International Monetary Fund 2002a). This position was also a strong increase from 11.0 percent of GDP in 1991, although the upswing in the international balance sheet for Japan was a somewhat smaller share of GDP than the downswing for the United States (figure 9.1).

So far the eroding international asset position of the United States has shown up only mildly in the capital income accounts. Thus, net capital income in the US current account swung from +$27 billion in 1991 to −$8 billion in the first half of 2002 (annual rate), as Japan's net capital income rose from $26.0 billion in 1991 to $70.1 billion in 2001 (Bureau of Economic Analysis 2002a; International Monetary Fund 2002a). A total downswing of $35 billion in the US capital income account, compared to a total net foreign asset downswing of $2.1 trillion (from the end of 1990 to the end of 2001), implies a surprisingly low average rate of return of 1.6 percent. So far, then, the economic cost of rising international indebtedness for the United States has been muted, reflecting a higher implied rate of return on foreign assets than on foreign liabilities. This differential appears to have been declining, however, suggesting the potential for a rising implicit return on net foreign liabilities (and rising deficit on capital income relative to net foreign liabilities) in the future.[10]

10. For 1991-97, capital income averaged 5.72 percent on US gross foreign assets, and capital payments 4.46 percent on US gross foreign liabilities, for a differential of 1.26 percent. These rates moved closer by 2001-02 to 3.63 percent on assets and 2.78 percent on liabilities, for a differential of 0.85 percent. For its part, Japan had higher rates of return on both its foreign assets and liabilities through the period but without much differential (with returns of about 7 percent on both assets and liabilities). Note that in July 2002 the official US data series both for foreign assets and liabilities and for capital income receipts and payments were substantially revised, to show a much slower decline in net foreign assets and, especially, net foreign capital income than previously reported.

Figure 9.2 Current account and change in net foreign assets, 1992-2000



Sources: IMF (2002a); BEA (2002a).

The changes in the net foreign asset positions of both the United States and Japan have broadly tracked their respective current account balances, though with big swings year to year (figure 9.2). This means that the accounting in the external statistics is broadly consistent with the conceptual economic requirement that in order to arrest the buildup of net external liabilities the United States will need to curb its current account deficit correspondingly.

To stabilize net foreign liabilities at, say, 25 percent of GDP, then at the margin the rise in the net foreign debt should not exceed this fraction of the rise in nominal GDP. Suppose the latter is 3 percent real growth plus 2.5 percent inflation, or 5.5 percent. This means the annual current account deficit should not exceed $0.25 \times 5.5 = 1.37$ percent of GDP, or $143 billion at present-scale nominal US GDP. This is an ambitious target, considering that the deficit reached $410 billion in 2000, eased only modestly to $393 billion in recession year 2001, and by the second quarter of 2002 was running at an annual rate of $520 billion, or 5.0 percent of GDP (Bureau of Economic Analysis 2002a, 2002b).

To identify the size of the economic external adjustment, it is first necessary to separate out that portion of the deficit that merely represents statistical illusion. From 1995-97 to 2000 the world current account discrepancy rose from an average of −$31 billion (0.23 percent of total world current account transactions) to −$133 billion (0.9 percent; International Monetary Fund 2002c, 202). The United States accounted for 13 percent of world merchandise exports plus imports in 1996, rising to 16 percent in 2000 (International Monetary Fund 2002b). Applying a US world trade share of 15 percent to the $190 billion world current account discrepancy projected for 2002 by the International Monetary Fund (IMF) (table 9.1), the recorded US current account deficit is currently exaggerated by about $30 billion. At the same time, this allocation also indicates that only a

Table 9.1 Current account balances (billions of US dollars)

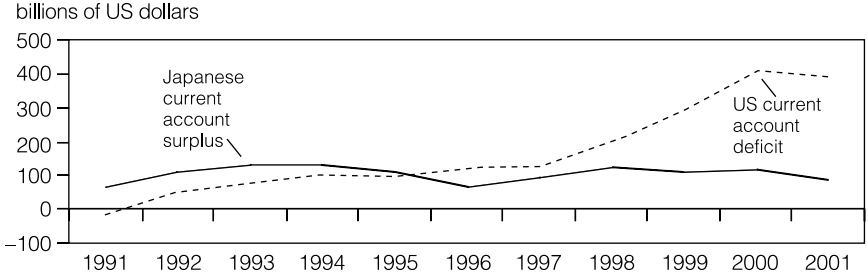
	1994	1995	1996	1997	1998	1999	2000	2001	2002f
United States	−118.2	−105.8	−117.8	−128.4	−203.8	−292.9	−410.3	−393.4	−479.6
European Union	10.1	48.3	79.0	108.6	68.5	13.7	−35.1	3.2	50.7
Japan	130.6	111.4	65.7	96.6	119.1	114.5	119.6	87.8	119.3
Other advanced economies[a]	−14.1	−5.8	10.5	5.7	−4.0	7.7	53.2	56.9	41.5
NIAE[b]	12.9	2.8	−3.5	10.8	67.4	60.9	45.5	57.1	57.9
Developing:	−84.6	−95.5	−74.7	−58.0	−85.1	−10.2	66.7	39.6	18.9
Africa	−11.1	−16.8	−6.4	−7.4	−20.1	−14.3	5.4	1.3	−7.2
China, India	6.0	−3.9	1.1	33.9	24.6	12.5	16.1	17.3	19.4
Other Asia	−25.0	−38.6	−40.0	−25.0	22.7	33.5	29.3	22.1	14.1
Latin America	−52.2	−36.5	−40.0	−67.2	−90.8	−56.7	−47.8	−52.9	−32.6
Middle East, Turkey	−2.3	0.2	10.6	7.7	−21.5	14.9	63.7	51.8	25.2
Transition	2.4	−2.3	−16.8	−24.1	−29.4	−1.9	27.1	11.8	1.4
Discrepancy	−61.1	−46.9	−57.6	11.2	−67.3	−108.0	−133.4	−136.9	−189.9
As percent of world current account transactions	−0.6	−0.4	−0.4	0.1	−0.5	−0.8	−0.9	−0.9	−1.2

f = forecast

a. Excluding NIAE.
b. NIAE = newly industrialized Asian economies: Korea, Taiwan, Hong Kong, Singapore.

Source: IMF, *World Economic Outlook*, September 2002.

Figure 9.3 Current account: US deficit and Japanese surplus, 1991-2001



Sources: IMF (2002a); BEA (2002a).

small part of the increase in the US external deficit in recent years has been attributable to the widening global discrepancy. Thus, from the 1995-97 average to 2000, 15 percent of the increase in the global discrepancy represented only $24 billion, or only 8 percent of the increase in the US current account deficit from $117 billion to $410 billion in this period.

If we assume that the target current account deficit ceiling of one-fourth of nominal GDP growth should be attained by 2005, then the target that year is approximately $170 billion.[11] Adding the statistical overstatement, the corresponding target for the recorded deficit would be approximately $200 billion in 2005. Assuming a benchmark US current account deficit of around $480 billion for 2002,[12] attainment of a $200 billion deficit by 2005 would require a US current account adjustment amounting to about $280 billion, phased in over three years. This US adjustment, then, can serve as a benchmark for the implied effects for the Japanese economy.

Extent of Japan's Share in the Counterpart

The first step in gauging the magnitude of the corresponding counterpart adjustment in Japan's current account surplus is to ask what share would be appropriate under ''normal'' circumstances. Any appropriate departure in implied Japanese adjustment in view of Japan's prolonged recession can then be considered separately.

Somewhat surprisingly, over the past several years there has been anything but a lockstep pattern relating changes in Japan's current account surplus to changes in the US current account deficit (see figure 9.3).

11. Assuming 5 percent nominal GDP growth this year and 5.5 percent thereafter, nominal US GDP reaches $12.25 trillion in 2005.

12. For the first half, the cumulative total was $242.5 billion. If the second half returns to the first-quarter rate, the total for the year will stand at $467 billion. If it maintains the second-quarter rate, the total will be $502 billion.

Although the two moved broadly together in 1991-94 and again in 1996-98, since 1997 Japan's surplus has remained relatively flat at about $100 billion while the US deficit has mushroomed from $140 billion to about $400 billion in 2000-01.

Part of the lack of widening in Japan's surplus can be attributed to Japan's share in the growing overstatement of the global deficit. Even so, this effect is relatively small. Japan's share in global trade turnover in 2000 was 6.3 percent. Applied to the IMF's projected global discrepancy for 2002, Japan's surplus this year is likely to be understated by only $12 billion. The recorded current account surplus was running at an annual rate of about $120 billion in the first seven months of 2002 (Bank of Japan 2002a). The surprising stagnation of Japan's surplus in the face of the ballooning US deficit also likely reflects Japan's trade surplus erosion vis-à-vis East Asia following the regional currency crisis.

Going forward, it is implausible that Japan's surplus can remain unchanged while the US deficit declines by some $280 billion after adjustment for global statistical discrepancy. What is the right Japan share in the counterpart adjustment? Various benchmarks come to mind. The first is simply: where are the present current account surpluses to be found? Table 9.2 reports the major current account deficits and surpluses in 2000 for about 80 economies. Japan's surplus that year ($117 billion) amounted to 25 percent of the sum of surpluses for all surplus countries. (The US deficit of $410 billion was 65 percent of the sum of major deficits by country.)

The current account surplus benchmark, moreover, could point to an even higher Japanese share in the counterpart adjustment. Some important ''surplus'' countries are not in a particularly strong position to experience a reduction in their surpluses, because these are already being used to finance capital flight. Russia and Venezuela alone account for about $60 billion in surpluses that are likely already earmarked for financing capital flight. If these two countries are excluded, Japan's share of the global surplus of surplus economies rises to 26.7 percent.

Another benchmark is Japan's share in global trade turnover. As shown in figure 9.4, whereas the US share in global trade turnover rose from about 13 percent in 1991 to 16 percent by 2000, Japan's share fell from 7.2 percent to 5.8 percent, an indication of Japan's shrinking role in the world economy. (Over this same period, Japan's GDP fell from 58 percent of US GDP to 48 percent, and further to 41 percent in 2001.) Excluding the United States from the pool of trade for calibrating the counterparty adjustment, Japan's share in non-US global trade turnover (the white bar in the figure) stood at about 6 percent in 2001.

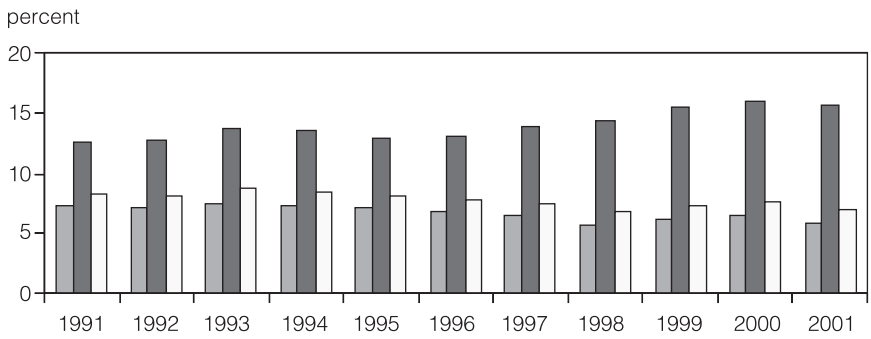
Still another gauge is Japan's share in bilateral US trade turnover, which was about 11 percent in 2000 (table 9.3). Unfortunately, a large block of US trade is with a relatively rigid dollar area. China and Hong Kong have

Table 9.2 Principal current account surplus and deficit countries
(billions of dollars, 2000)

Surplus		Deficit	
Colombia	0.4	United States	−410.4
Kazakhstan	0.4	United Kingdom	−28.8
Ecuador	0.9	Brazil	−24.6
Vietnam	1.0	Spain	−19.2
Syrian Arab Republic	1.1	Germany	−18.7
Ukraine	1.5	Mexico	−17.8
Yemen, Republic of	1.9	Australia	−15.4
Denmark	2.5	Portugal	−11.0
Oman	3.3	Poland	−10.0
Sweden	6.6	Greece	−9.8
Indonesia	8.0	Turkey	−9.8
Malaysia	8.4	Argentina	−9.0
Philippines	8.5	Italy	−5.8
Hong Kong	8.9	Austria	−4.9
Taiwan	8.9	India	−4.2
Finland	9.0	New Zealand	−2.7
Thailand	9.3	Czech Republic	−2.2
Netherlands	11.2	Peru	−1.6
Korea	12.2	Israel	−1.4
Iran	12.6	Romania	−1.4
Venezuela	13.1	Hungary	−1.3
Saudi Arabia	14.3	Guatemala	−1.0
Kuwait	14.7	Dominican Republic	−1.0
Canada	18.6	Chile	−1.0
France	20.4	Egypt	−1.0
China	20.5	Panama	−0.9
Singapore	21.8	Tunisia	−0.8
Norway	23.0	Mozambique	−0.8
Switzerland	32.5	Bulgaria	−0.7
Russia	46.4	Slovak Republic	−0.7
Japan	116.9	Lithuania	−0.7
Others	3.9	Uruguay	−0.6
Total	**462.8**	Zambia	−0.6
		South Africa	−0.6
		Sudan	−0.6
		Honduras	−0.5
		Nicaragua	−0.5
		Morocco	−0.5
		Latvia	−0.5
		Tanzania	−0.5
		Bolivia	−0.5
		El Salvador	−0.4
		Ghana	−0.4
		Estonia	−0.3
		Bangladesh	−0.3
		Jamaica	−0.3
		Kenya	−0.2
		Barbados	−0.1
		Paraguay	−0.1
		Pakistan	−0.1
		Total	**−626.3**

Source: IMF (2002a).

Figure 9.4 World trade turnover, 1991-2001 (percent)



Note: Light gray bar represents Japan's share of world trade turnover. Dark gray bar represents US share of world trade turnover. White bar represents Japan's share of non-US world trade turnover.

Source: IMF (2002a).

Table 9.3 Trade shares in 2000 by partner (percent)

	United States			Japan		
	Exports	**Imports**	**Turnover**	**Exports**	**Imports**	**Turnover**
United States	0	0	0	30.1	19.1	25.2
Japan	8.4	12.1	10.6	0	0	0
European Union	21.3	18.0	19.3	16.4	12.3	14.6
Canada	22.6	18.5	20.1	1.6	2.3	1.9
Other industrialized economies	3.3	2.1	2.5	2.8	5.7	4.1
Mexico	14.1	10.9	12.1	1.1	0.6	0.9
China	2.1	8.6	6.1	6.3	14.5	10.0
Hong Kong	1.9	1.0	1.3	5.7	0.4	3.4
Korea	3.5	3.3	3.4	6.4	5.4	6.0
Other Asia	9.8	12.3	11.4	22.8	21.5	22.2
Other Latin America	7.6	6.1	6.7	2.8	2.2	2.5
Middle East	3.0	3.3	3.2	2.2	13.0	7.0
Rest of world	2.4	3.9	3.3	1.8	2.9	2.3
Total	100	100	100	100	100	100
Dollar area:	18.0	20.4	19.5	43.2	34.7	39.5
United States	0.0	0.0	0.0	30.1	19.1	25.2
China and Hong Kong	4.0	9.5	7.4	12.0	15.0	13.3
Mexico	14.1	10.9	12.1	1.1	0.6	0.9

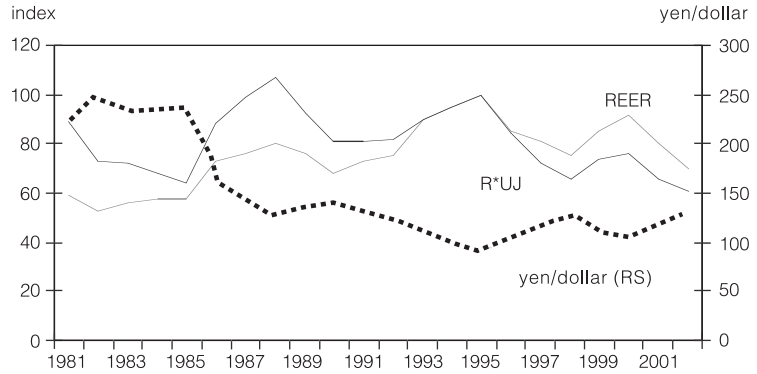
Source: IMF (2002d).

a de facto peg to the dollar. Mexico's economy is in lockstep with that of the United States, and until recently its currency has been even stronger than the dollar. These three economies alone account for 20 percent of US trade turnover. Malaysia has a de jure peg, as do Ecuador and some others, boosting the share further. So whereas Japan accounts for 11 percent of total US trade turnover, it probably represents about 14 percent of US trade turnover excluding that with rigid dollar-area countries. Of course it might prove appropriate and even essential for some key economies, such as China, to participate in a general appreciation of

Table 9.4 Alternative benchmarks for Japan's prospective share in the US current account adjustment

Share	Percent
Share in current account change from 1995 to 2001	0
Share in sum of current account surpluses for surplus countries	24-27
Share in global non-US trade turnover	6
Share in US trade turnover	11
Share in US trade turnover excluding rigid dollar-area countries	14

Figure 9.5 Japan's exchange rate, 1981-2002



REER = real effective exchange rate; R*UJ = bilateral real exchange rate, yen/dollar (both 1995 = 100, left scale)

Sources: IMF (2002a)

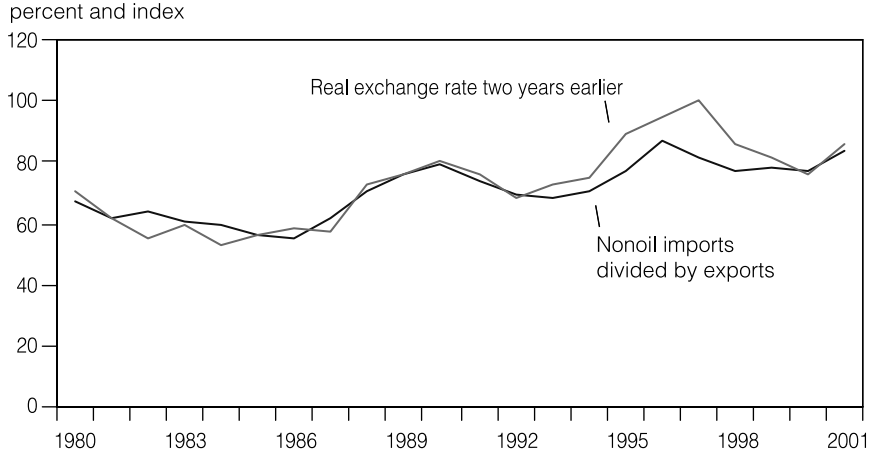
foreign currencies against the dollar to permit US external adjustment. Even so, resistance can be expected from these governments.

Overall, the benchmarks seem to suggest a range of 10 to 25 percent for Japan's counterparty share in the US current account adjustment (table 9.4), when the latter is already calibrated to exclude any ''free ride'' from global discrepancy disappearance. On this basis, if we assume a $280 billion target reduction in the US current account deficit (after taking account of ''water'' in the reported magnitude from the global statistical discrepancy), and if 10 to 25 percent of the counterpart foreign adjustment is Japan's share, then Japan faces a current account adjustment ranging from $28 billion to $70 billion, before taking account of the special recessionary circumstances.

Implications for the Yen

In examining the implications of the Japanese external adjustment for the yen, it is useful first to recall where the yen stands and where it has come from (figure 9.5). In 1981 the yen was at 220 to the dollar. It weakened

Figure 9.6 Japan: Ratio of nonoil imports to exports, and lagged real exchange rate, 1980-2001 (percent and index)



Sources: IMF (2002a); Ministry of Public Management (2002); Statistics Canada (2002); and UNCTAD (2002).

to about 240 at the dollar's peak in 1985, then strengthened to 94 in 1995 before weakening during the 1996-2002 period of the Rubin-Summers strong-dollar policy (which was buttressed, from the exchange rate standpoint, by the US equity bubble and the corresponding inducement to capital inflows). The yen reached 130 (year average) in 1998, then strengthened to 108 in 2000 (the one recent year of nonrecession Japanese growth) before weakening again to an average of 132 in the first quarter of 2002 as the markets reacted to Japan's renewed recession. Since then (not shown) it has risen to an average of about 124 in the second quarter and 120 in the third as part of the retreat of the dollar and in response to some improvement in growth expectations from rising Japanese exports.

Japan's inflation has systematically been less than that of the United States, so the secular real appreciation of the yen is less than the nominal rate might imply. Figure 9.5 reports the IMF's real effective exchange rate (REER) for Japan (1995 = 100), based on relative unit labor costs, and a corresponding bilateral real exchange rate against the dollar deflating by consumer price indices. There are obvious cycles associated with the dollar cycle (Japan's REER was at a trough in 1985, rising sharply through 1988 after the dollar adjustment, rising to a new high by 1995, and then broadly falling with the late 1990s US boom).

Despite the swings, there has been a secular appreciation. A simple regression of the REER on time for 1981 through the first quarter of 2002 yields: REER = 59.3 (13.8) + 1.40T (4.3), in which the t-statistics are shown in parentheses. By this equation, the historical-trend real exchange rate for 2002 should average 90.1. That corresponds to a nominal yen of 103 per dollar for 2002 on average. So the yen remains undervalued

compared to its historical trend of two decades. The trend also means that on average the REER for Japan appreciates 1 to 2 percent annually.

The relevance of the yen to Japan's external surplus depends, of course, on whether the exchange rate influences trade. The evidence suggests that it does. As shown in figure 9.6, there has been a close relationship between the ratio of non-oil merchandise imports relative to exports in a given year, on the one hand, and the level of the real exchange rate two years before, on the other.

In previous work I have presented econometric models for forecasting Japan's current account (Cline 1995, 1989).[13] These models are in the tradition of what Krugman (1991) has called the ''Massachusetts Avenue'' model (after the addresses of institutions in Cambridge, Massachusetts, and Washington, DC). This approach relates exports and imports to the relative price between home and foreign goods as affected by the exchange rate; exports are further related to foreign demand growth and imports to domestic demand growth. A key element in this approach is the assumption that a change in the nominal exchange rate tends to move the real exchange rate (in the same direction) rather than being largely or fully neutralized by a compensating change in domestic prices (contrary to the ''law of one price'' view). Krugman documents the close relationship of real to nominal exchange rate changes from the early 1980s through 1991 period.[14]

The appendix sets forth the structure of the reduced form model (RFM) and reports results of reestimation of the model through the second quarter of 2000. It also considers what values the model's parameters would take if instead ''stylized'' parameters from the literature were applied for the price and income elasticities and pass-through ratios. Table 9.5 translates the estimates of the reestimated and stylized models into impact parameters measuring the change in Japan's current account for a 1 percent change in the real exchange rate, in domestic growth, and in foreign growth. These parameters refer to the full effects after the two-year lags

13. Cline (1995) estimates the reduced form model (RFM), and Cline (1989) estimates the external adjustment with growth (EAG) model.

14. Obstfeld (2002) has noted that there have been historical rounds of ''pessimism over the gross benefits of flexible exchange rate'' dating back to the 1950s, when ''elasticity pessimism'' was used as one factor in supporting the Bretton Woods fixed exchange rate regime. He suggests that a recent round of pessimism, based on ''extremely low and slow pass-through of exchange rates to consumer prices . . . stems from oversimplified modeling strategies'' and concludes that the simplest models may remain relatively reliable as policy guides. He notes, however, that the transmission mechanism from exchange rate change to trade change may be different from the traditional model. He emphasizes that it may be firms, especially multinational firms allocating production geographically, whose decisions are central rather than consumers, and firms respond to the real exchange rate measured by relative unit costs. He also emphasizes that import prices paid at the point of entry may behave very differently from CPI prices of imported goods.

Table 9.5 Japan's current account impact parameters
(billions of US dollars)

	Model			
Impact of:	**EAG89R**	**RFM95R**	**RFM02ES**	**RFM02ST**
1 percent increase in real exchange rate	−4.4	−2.5	−1.3	−2.2
1 percent increase in growth rate sustained for one year:				
Domestic	−6.3	−3.4	−5.0	−3.8
Foreign	n.a.	3.5	1.3	3.1

EAG = Economic Adjustment with Growth Model
ES = estimated
n.a. = not applicable
R = rescaled
RFM = Reduced Form Model
ST = stylized

are completed (in the initial year there can instead be J-curve effects going the opposite direction, for exchange rate change). The table also reports the corresponding impact parameters from Cline (1995) after appropriate scaling up to levels consistent with the change in the trade base from the earlier model (1994 levels) to the average of 2000-01.[15]

One important feature of the rescaled estimates is that they are little changed from the 1994 base used in the 1995 model. This reflects the minimal export growth and modest import growth in dollar terms from 1994 to 2000-01.[16] This is another manifestation of the relative shrinkage of Japan in the world economy.

A provocative pattern of the estimated impact parameters scaled to 2000-01 is that they have shown a successive decline for the real exchange rate impact from the 1989 model to the 1995 model and now the 2002 model. The decline in the first period may reflect model differences, but in the second period the model structure is the same. At the least this trend suggests mild evidence on the side of increasing ''elasticity pessimism'' rather than of increasing elasticity optimism.[17]

15. Scale factors are from 1994 base to average 2000-01 base, as follows. For the exchange rate impact, sum of exports and nonoil imports, goods and nonfactor services; for domestic growth, imports of goods and nonfactor services; for foreign growth, exports of goods and nonfactor services.

16. Thus, whereas for the United States the dollar value of imports (goods and nonfactor services) rose 68.9 percent and exports 46.2 percent over this period, for Japan the respective increases were 21.2 percent and 2.8 percent. The scale factors from 1994 to 2000-01 are: exchange rate effect, 1.2; domestic growth, 1.17; foreign growth, 1.24.

17. What amounts to the excess of the sum of the import and export price elasticities above the Marshall-Lerner threshold of unity (after taking account of pass-through; see the appendix) has fallen from about 0.6 to about 0.3 in the RFM95 and RFM02 estimates.

Table 9.6 Alternative scenarios for Japan's external adjustment

	A	B	C	D	E
US adjustment target (billions of US dollars)	280	280	280	280	200
Japan's share:					
Percent change	15	15	15	25	10
Amount (billions of US dollars)	42	42	42	70	20
Accomplished by:					
Real exchange rate					
Percent change	18.0	11.9	5.9	29.9	−3.5
Amount (billions of US dollars)	42.0	27.9	13.8	70.0	−8.2
Domestic growth change:					
Year-percentage points	0	3	6	0	6
Amount (billions of US dollars)	0	14.1	28.2	0	28.2

Conversely, the 2002 version of the RFM shows a higher impact for domestic growth (where the elasticity has risen from 0.92 to 1.3). This is consistent with the broad image of Japan as a more open economy today than in the past. In contrast, the impact of a percent change in foreign growth has fallen, though this is likely because a sharp reduction in the elasticity (from 0.99 to 0.33) primarily reflects a shift toward greater inclusion of rapidly growing developing countries (especially China and Korea) in the 2002 version of the model estimates. Ironically, the new estimates seem to suggest a Houthakker-Magee elasticity asymmetry for Japan like that traditionally seen for the United States (exports grow more slowly in response to foreign income growth than imports in response to domestic growth), although the likelihood is that the new estimates reported in the appendix understate the export elasticity.

Taking a weighted average of the estimates in table 9.5 giving greater weight to the 2002 estimated RFM, the central estimates for Japan's current account impact parameters may be placed at $2.3 billion for a 1 percent change in the real exchange rate; $4.7 billion for 1 percent additional domestic growth for one year; and $2.3 billion for 1 percent additional foreign growth for one year.[18]

Using these impact parameters, it is possible to consider several broad alternative scenarios for external adjustment as Japan's counterpart to US external adjustment. Table 9.6 reports five scenarios. The first three are the principal cases for consideration, and the fourth and fifth are more in the nature of sensitivity analysis. The central target for US adjustment is to reduce the annual current account deficit by $280 billion by three

18. The weights are 0.4 for RFM02ES and 0.2 for each of the others, for the exchange rate and domestic growth effects; and 0.5 for RFM02ES and 0.25 for each of the others, for foreign growth effects (where there is no EAG89R estimate available).

years from now, as discussed above. The first three scenarios all assume that Japan's share of this adjustment is 15 percent ($42 billion), in the middle of the ranges identified in table 9.4. In comparison, in the first seven months of 2002 the actual current account surplus has been running at a rate of $120 billion annually, so this target would shrink the surplus by about one-third.

In variant A, there is no change from Japan's baseline growth, which is probably on the order of −0.5 percent in 2002 and 1.5 to 2 percent thereafter (year over year; see, e.g., Mussa 2002). With no acceleration of the growth baseline, all adjustment must be carried out by real appreciation of the yen on a trade-weighted basis. Applying the impact parameter, the yen must rise in real terms by 18 percent. The required adjustment on the exchange rate side is successively reduced in scenarios B and C by more ambitious targets for acceleration of Japanese domestic growth. In variant C, over a three-year period growth is sustained at 2 percentage points annually higher than the baseline (or at an annual average of about 3.5 to 4 percent). The 6 year-percentage points applied to the impact parameter contribute a $28 billion reduction in the surplus, leaving only $14 billion to be accomplished by real appreciation, which in turn can be accomplished by a rise of only about 6 percent in the real yen.

Scenario D considers an extreme variant in which Japan must take on 25 percent of the share in the US external adjustment, calling for a reduction in Japan's current account surplus by $70 billion (about 60 percent of the current level). Japan's economy remains stuck at low growth in this variant, so there is no contribution from domestic growth acceleration. The result is that real appreciation must reach 30 percent to attain the target adjustment. Scenario E considers the opposite extreme of easy adjustment. The US current account target is much less ambitious, at a $200 billion reduction. Japan's share is at the low end of the reasonable range, at only 10 percent. Japanese growth rises by the two percentage points over the full three years (as in scenario C). Under these circumstances, the yen does not need to decline at all, but instead can appreciate by 3.5 percent while still meeting the target of reducing Japan's current account deficit by $20 billion.

The most realistic of these scenarios would seem to be A and B. It should be pointed out that the implied rise of the yen against the dollar is larger than the rise in the real effective exchange rate. The United States accounts for almost half of Japan's exports. So if all other countries appreciate against the dollar in real terms by v percent and Japan does not appreciate at all against the dollar, Japan's real exchange rate falls by about $0.5v$ percent. Suppose that in the international adjustment process it will require a trade-weighted real depreciation of the dollar by about 15 percent.[19] If y is the appreciation of the yen against the dollar and z is

19. A rescaling of the RFM95 model for the United States, similar to that here for Japan, generates a real exchange rate impact parameter of a $17 billion adjustment for each percentage point real appreciation, yielding a required depreciation of 16 percent for a target adjustment of $280 billion. Note, however, that this impact estimate is probably on the high end of the range of international estimates.

the yen's appreciation against the rest of the world, then in scenario A, Japan's 18 percent effective appreciation would comprise: $x = 18 = 0.5y + 0.5(3)$; $y = 33$. Here, Japan's 18 percent appreciation in comparison with 15 percent by non-US rest of world means a 3 percent appreciation against these other countries ($z = 3$), so the real appreciation against the dollar must be 33 percent. For example, an appreciation of this magnitude would take the yen from its current rate of 122 to the dollar to 92 to the dollar. The corresponding calculation for scenario B generates a yen at 101 to the dollar.[20] The latter outcome turns out to place the yen at close to the level that would be consistent with its historical trend in real terms over the past two decades (as discussed above).

Taking Japan's Recession into Account

Many would argue, however, that the last thing Japan needs now is an appreciation of the yen, as the export sector seems to be the one source of recent buoyancy in a precarious economy. The converse of the special-exemption argument is the view that Japan cannot indefinitely be given a free ride in the process of international adjustment and be allowed chronically to ''export its unemployment'' to the rest of the world.

Cyclical Adjustment in Exchange Rate Policy

Treatment of divergent points in the business cycle within the framework of fundamental equilibrium exchange rates (FEERs), as proposed by Williamson (1983), allows for tailoring the adjustment to the circumstances. In particular, for an undervalued exchange rate in an economy in recession, the proper adjustment would be to expand fiscal stimulus, as this would tend to obtain internal adjustment while boosting interest rates and the currency and hence also contributing to external adjustment. In Japan's present circumstances, however, the problem is that the markets are concerned about the high ratio of public debt to GDP. Raising the fiscal deficit could raise the government default risk premium, partially offsetting the stimulus.

FEER adjustment also can be thought of as appropriately calibrated in terms of structural—or full-employment—exchange rates. In this approach, for a country in recession, undervaluation of the exchange rate relative to the FEER would be permitted until the economy has recovered. In one version of this formulation, where there is a wide band (e.g., ± 15 percent) around the FEER, a country in recession would be expected to

20. Or: $0.5y + 0.5(3) = 11.9$; $y = 20.8$ percent increase in the yen against the dollar.

be near the lower (depreciated) edge of the band, whereas a country in over-full employment would be expected to be toward the upper edge.

Financial Market Effects?

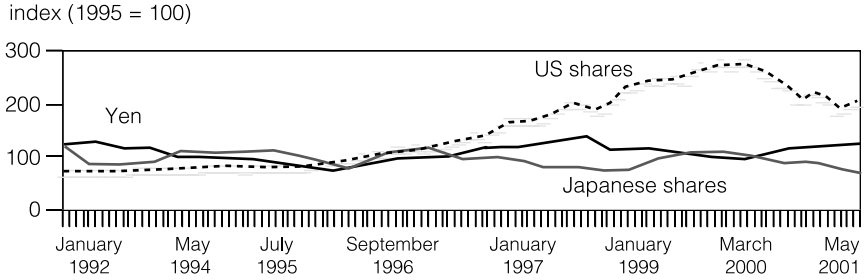
A key related question is whether the strength of the yen acts as a major signal affecting financial markets in Japan. The weakness of Japan's stock market in particular is of concern, considering not only that it likely affects consumer expectations and business investment plans but also that stock valuations affect bank capital because of the large stock holdings of Japanese banks (recently estimated at about ¥40 trillion, or $328 billion; *Financial Times*, September 18, 2002). Stock holdings are about the same in magnitude as the officially estimated nonperforming loans of the system (¥43 trillion). The Japanese banking system has continued to remain under severe pressure. Total bank capital has fallen from ¥35.1 trillion in March 1999 to ¥29.1 trillion in March 2002, while unrealized capital gains on stocks and other securities have fallen from ¥10.8 trillion to ¥0.3 trillion over this period (Bank of Japan 2002b). At the end of March 2002 the Nikkei 225 index stood at 11,204 (Bank of Japan 2002a); on September 17, 2002, it stood at 9,472, strongly suggesting that the unrealized capital gains have turned into sizable unrealized capital losses (prompting the Bank of Japan on that date to propose purchasing stocks directly from banks to prop up their balance sheets for the close of the quarter at the end of September). In short, if a significant appreciation of the yen were to depress the stock market further, it could impose through the financial markets channel an adverse impact on the Japanese economy that would magnify the direct trade effects of the external sector adjustment.

Some analysts have increasingly questioned whether the exchange rate is a dominant factor in determining growth and investment expectations and equity market prospects in Japan, however.[21] Moreover, the statistical evidence does not support a systematic influence of the yen exchange rate on stock prices. Trends in stock prices in the United States and Japan in recent years do not show a relationship of Japanese share prices to the value of the yen against the dollar. They do show a sympathetic response of Japanese share prices to US share prices, however, at least after late 1998 (figure 9.7).

For the period 1992 through August 2002, a simple regression of the monthly percent change in the Nikkei 225 index (dN) on the percent change in the exchange rate (dR) lagged one month (yen per dollar) and on the percent change in the S&P 500 index (dS) shows the following

21. One recent study (Matsuoka and Adachi 2002) judges that ''the effects from the movement of the exchange rate, compared with 10 or 20 years ago, have become much less profound. . . . Positive effects on economic activity through yen depreciation and accompanying improvement in corporate profits may be smaller than had been thought.''

Figure 9.7 Stock prices in the United States (S&P 500) and Japan (Nikkei 225) and yen exchange rate against the dollar



Sources: Yahoo Finance (2002).

relationship: $dN = -0.72 - 0.049dR + 0.582dS$. This result has the wrong sign for the supposed adverse impact of yen appreciation on the Japanese stock market, but this variable is not statistically significant in any event ($t = -0.36$). In contrast, the constant term showing a monthly decline of 0.72 percent is relatively significant ($t = 1.8$), and the US stock price term is highly significant ($t = 5.0$). A 1 percent rise in US stock prices over this period was associated with a 0.58 percent rise in Japanese stock prices.[22]

In short, the evidence does not support concerns that yen appreciation would cause a serious decline in the Japanese stock market. This finding suggests that the principal focus of concern about the impact of Japan's external adjustment should be on the real activity effects rather than the possible effects through stock prices and the financial markets.

Real Activity Effects

It is possible to consider the real growth effects of the external adjustment by going directly from the target current account surplus reduction to the implied impact on real net exports in the national accounts. The first step is to consider the magnitude of the adjustment relative to GDP. If we use a 15 percent share as Japan's target counterpart of the US adjustment, the resulting $42 billion (table 9.6) is equivalent to 0.94 percent of average 2000-01 GDP in dollar terms (IMF 2002a). If this were phased in over three years, the implication would be an adjustment magnitude equivalent to 0.31 percent of GDP annually.

The next step is to consider the relationship between the real external adjustment and the nominal adjustment. Appreciation of the currency makes exports more expensive in foreign currency (dollar) terms, while

22. A regression restricted to the period October 1998 through August 2002 boosts this coefficient to 0.69.

imports priced in foreign currency become cheaper in domestic currency terms (yen). Thus it will require a smaller physical volume of exports and a larger physical volume of imports to generate the same foreign-currency nominal value trade surplus. This means that the real trade balance adjustment is larger than the nominal trade balance adjustment.

With import and export price elasticities both in the vicinity of unity, and with import and export pass-through ratios in the range 0.7 to 0.9, the ratio of the real trade balance change to the nominal trade balance change is about 2 to 1 (Cline 1989, p. 360). Applying this ratio, the target adjustment for Japan would amount to a total of about 1.9 percent of GDP, or 0.63 percent annually over three years. This direct effect is substantial, gauged against a baseline growth rate of 1.5 to 2 percent.

Conclusion

Although the principle of cyclical adjustment suggests that some delay would be appropriate, eventually Japan should likely not be exempt from the international decrease in current account surpluses (or increase in deficits) that will be required as the counterpart of US reduction of its outsized current account deficit. The range of targets considered in this paper for the US adjustment and Japan's share suggests that in a relatively favorable outcome (such as that in variant B of table 9.6), by 2005 Japan could reduce its current account surplus by perhaps some $40 billion (compared to the current pace of $120 billion annual surplus) as its share in a $280 billion US current account deficit reduction. This would involve achieving domestic growth on the order of about 2.5 to 3 percent annually over this period, or 1 percent above baseline.

This outcome would require policies capable not only of securing the extra growth above baseline but also of compensating for about 0.6 percent of GDP annually that would be lost in real demand from the decline in real net exports associated with the adjustment. It would also likely require a real effective exchange rate appreciation of about 12 percent, which in turn would likely imply a real appreciation against the dollar of about 21 percent. This would take the yen from its current level of about 122 per dollar to 101 per dollar, which is also about the level that is consistent with the historical trend in the real value of the yen over the past two decades.

The policy implications of these findings would seem to include the following. First, once Japan begins to show sustained recovery, it would seem inappropriate for Japanese (or international) authorities to seek to block the gradual appreciation of the currency toward this range.[23] Second,

23. Note that, in contrast, Ito (2002) identifies 115 yen per dollar as a revealed intervention rate at which the Bank of Japan has sought to halt the rise of the yen in recent years.

the need for the United States to curb its external deficit and for Japan sooner or later to absorb some portion of the counterpart surplus reduction will likely be an additional reason—beyond the already challenging domestic difficulties, including banking sector fragility—for the Japanese authorities to pursue aggressive measures for economic stimulus for some time. Their task is a daunting one for which there are no easy recipes, in view of the Japanese economy's unusual combination of circumstances—recession and deflation despite near-zero interest rates; high government debt ratio; banking sector balance sheet problems; and a weak stock market.

Appendix 9.1
Modeling Japan's Current Account Balance

In a previous publication (Cline 1995) I set forth a forecasting model for Japan's current account balance, centered on the following relationship:

$$(1)\quad \ln z_t = \ln \frac{p_f}{p_d} + \alpha + [\phi - \beta]\ln R^*_{Lt} - [\phi(1 + \rho) + \beta\epsilon]\ln R_{Lt} + \theta \ln Y_d - \gamma \ln Y_f + [\rho - \epsilon]\ln R_t$$

where z_t is the ratio of nonoil imports of goods and services to exports of goods and services; p_f is the foreign price of the imported goods in foreign currency; p_d is the domestic price of the exported goods in domestic currency; ϕ is the absolute value of the price elasticity of imports; β is the price elasticity (< 0) of exports; R is the nominal effective exchange rate; R^* is the real effective exchange rate; subscript t refers to the current period; operator L in the subscript refers to a weighted average of the previous eight quarters; θ is the income elasticity of imports; γ is the elasticity of exports with respect to foreign income; ρ is the pass-through parameter from the exchange rate to import prices; and ϵ is the pass-through parameter from the exchange rate to export prices.[24] When pass-through from exchange rate change to trade price change is complete, the pass-through parameters take the values $\beta = -1$ and $\epsilon = 0$. If instead pass-through is only 85 percent (for example), then $\beta = -0.85$ and $\epsilon = -0.15$.

This appendix reports new estimates of this model, using quarterly data from 1980 through the second quarter of 2000. The International Monetary Fund's index of nominal effective exchange rate (NEER, based on relative unit labor values) is used for R; its corresponding index for

24. See Cline (1995, 14). Note that the lag operator has the following weights on prior quarters beginning with the quarter prior to the present: 0.067, 0.117, 0.15, 0.167, 0.167, 0.15, 0.117, 0.067.

the real effective exchange rate (REER) is used for R^*; and p_f/p_d is calculated as NEER/REER (Cline 1995, 20). Weighted foreign GDP growth is based on the IMF's reported quarterly real GDP data for Japan's eight largest trading partners, weighted by 1990-95 shares in Japan's exports.[25] Japan's quarterly real GDP is also as reported by the IMF (2002a). Quarterly imports and exports of goods and nonfactor services are from the same source. The series on oil imports refers to Standard International Trade Classification (SITC) 33, and data are from the Ministry of Public Management (2002).

The regression estimated is:

$$(1') \quad \ln z_t - \ln \frac{p_f}{p_d} = \alpha + \pi_1 \ln R^*_{Lt} + \pi_2 \ln R_{Lt} + \pi_3 \ln Y_d + \pi_4 Y_f + \pi_5 \ln R_t + \sum_i d_i D_i$$

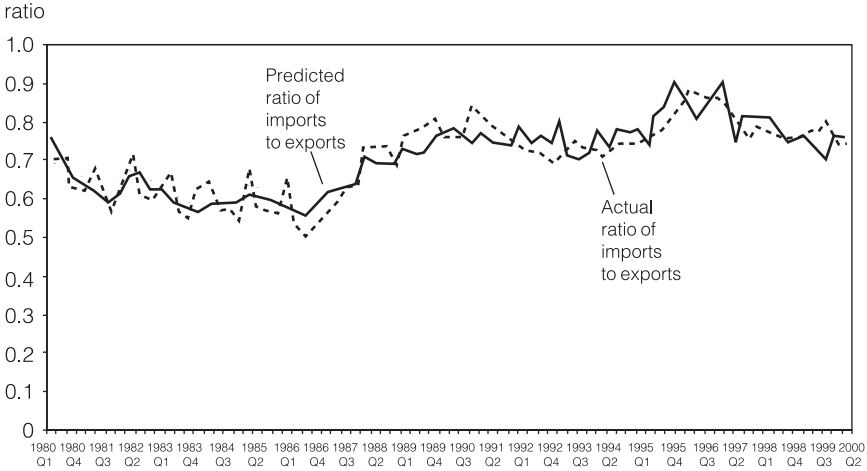
where $\pi_1 = [\phi - \beta]$, $\pi_2 = -[\phi(1 + \rho) + \beta\epsilon]$, $\pi_3 = \theta$, $\pi_4 = -\gamma$, $\pi_5 = [\rho - \epsilon]$, and D_i are dummy variables for the quarter in question. The equation is estimated using Cochran-Orcutt correction for autocorrelation. The resulting estimated parameters are as follows, with t-statistic in parentheses:

$$\begin{aligned}
\alpha &= -6.28\ (-6.9);\\
\pi_1 &= 2.056\ (7.8);\\
\pi_2 &= -1.471\ (-5.1);\\
\pi_3 &= 1.297\ (4.4);\\
\pi_4 &= -0.331\ (-2.4);\\
\pi_5 &= -0.256\ (-3.2);\\
d_1 &= 0.0324\ (2.2);\\
d_2 &= 0.0128\ (0.8);\\
d_3 &= -0.0132\ (-0.9);\\
rho &= 0.242;\\
\textit{Adjusted } R^2 &= 0.5971.
\end{aligned}$$

Figure 9A.1 displays the fit between the predicted and actual ratio ''z'' of nonoil imports of goods and services to exports of goods and services for 1980Q1 through 2000Q2. The figure suggests a reasonably close fit, as does the adjusted R^2.

25. The countries and shares are: China, 0.064; Germany, 0.087; Hong Kong, 0.095; Korea, 0.098; Singapore, 0.072; Thailand, 0.057; United States, 0.47; and United Kingdom, 0.064.

Figure 9A.1 Predicted and actual ratio "*z*" of Japanese nonoil imports of goods and services to exports of goods and services, 1980Q1-2000Q2.



Source: See text.

These estimates place the sum of export and import price elasticities (π_1) at a relatively high value of 2. However, they also place leakage associated with pass-through ratios (captured in regression coefficients π_2 and π_5) relatively high. As shown in Cline (1995), the elasticity of the ratio of the value of nonoil imports of goods and services to exports of goods and services with respect to the real exchange rate is: $\pi_1 + \pi_2 + \pi_5$. This expression is analogous to the excess of the sum of export and import price elasticities over the threshold of unity in the Marshall-Lerner condition for devaluation to help correct the external deficit. In this estimate, this magnitude has shrunk to -0.33, from an estimate of -0.58 in Cline (1995), suggesting a deterioration in pass-through ratios in recent years from the standpoint of efficacy of adjustment through exchange rate changes.

As indicated in Cline (1995), the current account impact parameters showing the effect of a 1 percent change in real exchange rate (after completion of lags) or a one percentage point change in growth are estimated as:

$$2)\ \Delta B_{R^*} = -X_0 z_0[\pi_1 + \pi_2 + \pi_5][.01]$$

for the real exchange rate;

$$3)\ \Delta B_{gd} = -X_0 z_0 \pi_3[.01]$$

for domestic growth; and

4) $\Delta B_{gf} = -X_0 z_0 \pi_4 [.01]$

for foreign growth, where z_0 is the ratio of imports of nonoil goods and services to exports of goods and services in the base period and X_0 is the value of exports of goods and services in the base period. The main text uses the empirical estimates of this appendix for the parameters π_i and the average of 2000 and 2001 values for X_0 and z_0 to obtain the impact estimates reported in table 9.5.

An alternative approach is to use stylized parameters from the literature for the underlying elasticities and pass-through ratios that comprise the model coefficients of equations 1) through 4). Hooper and Marquez (1995) place pass-through parameters as: $\rho = -1$ (complete pass-through for import prices) and $\epsilon = -0.15$ (85 percent pass-through for export prices; see Cline 1995, 77). Obstfeld (2002, 6) suggests that recent estimates for international experience more generally might place both pass-through ratios at only about 0.5 for a one-year time frame but at complete pass-through over time. Hooper and Marquez place both the import and export income elasticities at unity ($\theta = \gamma = 1$), a result confirmed in Cline (1995, 22-25). Hooper, Johnson, and Marquez (1998, 3) estimate the long-run price elasticity at -1.0 for Japanese exports (β) but only -0.3 for Japanese imports ($-\phi$). The same study places the income elasticity of Japanese exports at 1.1 and imports at 0.9.

Consideration of these various estimates suggests the following. First, in decomposing the sum of import and export price elasticities (π_1) into their two respective components, a larger (absolute) value may be appropriate for the export price elasticity than for the import price elasticity. Second, somewhat less than complete pass-through seems appropriate on both the import and export sides for the time frame of two to three years.

Experimentation with stylized parameter values, moreover, shows that when the sum of price elasticities is as high as 2 (as in both the RFM95 and RFM02 models), when the pass-through parameters are raised above their low levels implied by these regression estimates toward high but below-complete pass-through, the result is to overpredict swings in the import/export ratio associated with swings in the real exchange rate. On this basis, some narrowing of the sum of price elasticities toward the relatively low 1.3 found by Hooper, Johnson, and Marquez (1998) seems appropriate.

Finally, the low export income elasticity estimated in the new results above likely reflects the shift of the foreign income variable to include such rapidly growing economies as China and Korea. For use with this foreign income series, somewhat below unity seems appropriate for the export income elasticity.

Table 9A.1 Stylized parameter values

Parameter	Concept	Value
ϕ	Import price elasticity (absolute value)	0.55
β	Export price elasticity	−0.95
θ	Import income elasticity	1.0
γ	Export income elasticity	0.8
ρ	Import price pass-through	−0.85
ϵ	Export price pass-through minus unity	−0.2
π_1	$= \phi$-β	1.5
π_2	$=$ - $[\phi(1+\rho) + \beta\epsilon]$	−0.27
π_3	$= \theta$	1.0
π_4	$= -\gamma$	− 0.8
π_5	$= [\rho - \epsilon]$	−0.65

Table 9A.1 presents a resulting set of ''stylized'' parameter values.

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