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JAPANESE FINANCIAL POLICIES AND THE  
U.S. TRADE DEFICIT

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## ESSAYS IN INTERNATIONAL FINANCE

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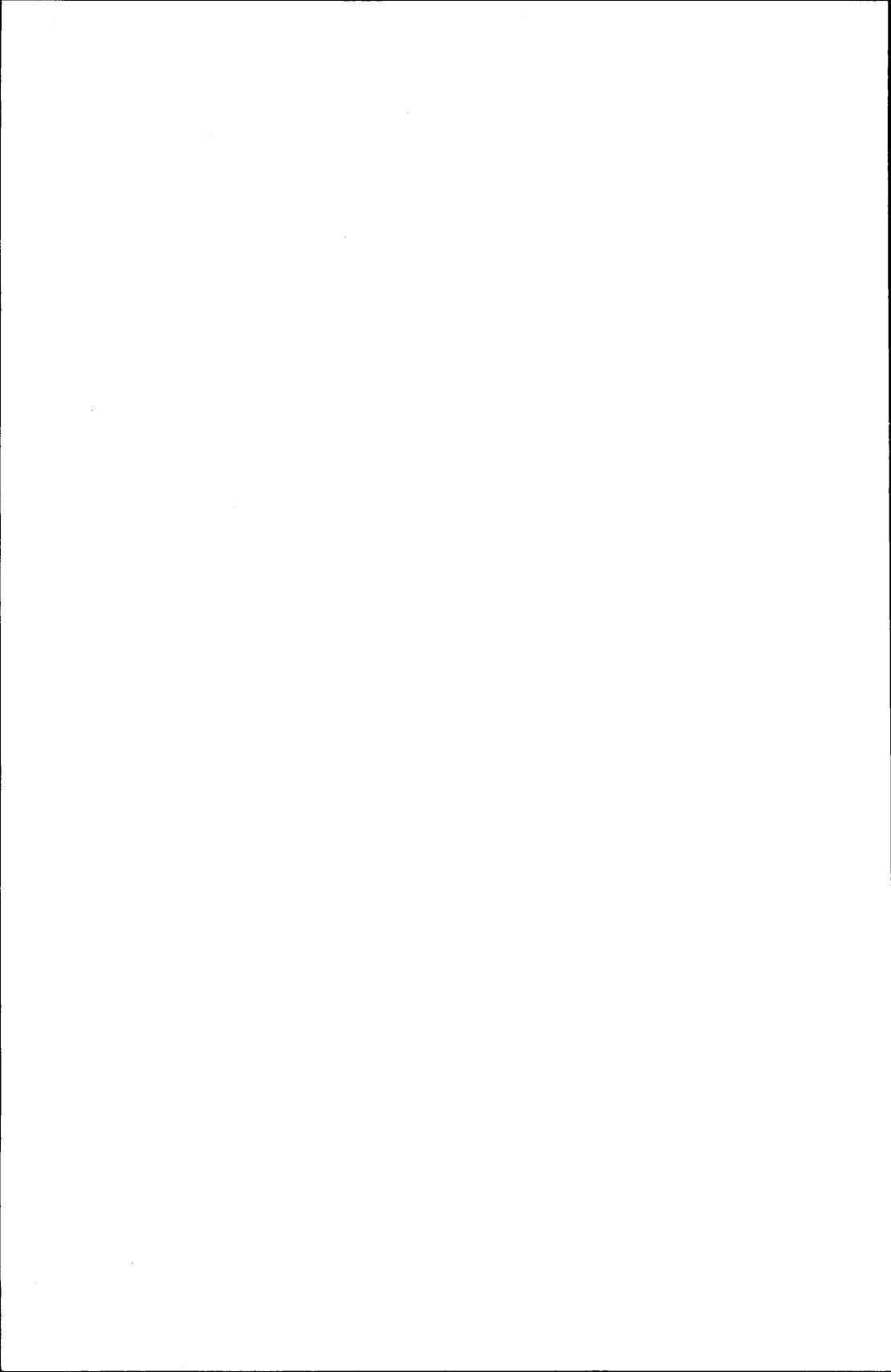
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# Japanese Financial Policies and the U.S. Trade Deficit

## Introduction

The United States has a tradition of attributing its trade deficits to the financial policies of its major trading partners. The Nixon administration blamed the 1971 trade deficit on the failure of other industrial countries to revalue their currencies. The Carter administration blamed the large U.S. trade deficits in the latter half of the 1970s on the failure of Germany and Japan to undertake monetary and fiscal expansion. Blame for the rapidly rising U.S. trade and current-account deficits of the early 1980s has been assigned chiefly to the undervalued yen and to the Japanese financial policies to which it is attributed.

The emphasis on Japanese policies as a major cause of U.S. trade deficits is understandable. Despite some liberalization of Japan's imports, the U.S. bilateral trade deficit with Japan in 1984 was equal to almost a third of the total U.S. trade deficit, and the bilateral deficit with Japan in manufactured goods was over half the total U.S. deficit in manufactured goods (see Table 1 below). Therefore, it is generally believed that a large share of the increase in U.S. trade deficits from 1980 through 1984 can be attributed to Japan's trade and financial policies. The purpose of this essay is to examine the validity of this allegation with respect to Japan's financial policies.

The following criticisms of Japan's financial policies have been made:

1. Japan's intervention in the foreign-exchange markets has been biased toward depreciation of the yen in terms of the dollar.
2. Japan's mix of fiscal and monetary policies has contributed to an undervaluation of the yen.
3. Japan's high rate of personal savings combined with reduced domestic investment and restrictive fiscal policies have resulted in a surplus of domestic income over expenditures. This has given rise to large net capital exports, which in turn have depressed the exchange value of the yen.
4. Japan's control over international capital transactions and domestic capital markets and interest rates has encouraged capital exports, thereby contributing to the depreciation of the yen.

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We first look at the changes in the U.S. and Japanese trade balances and exchange rates between 1980 and 1984. Next, we evaluate the above allegations as explanations for the increase in the U.S. multilateral trade deficit between 1980 and 1984. Finally, we examine the assumption implicit in these allegations that bilateral trade flows between the United States and Japan are sensitive to changes in the yen/dollar exchange rate. Because the focus is specifically on the role of Japan's financial policies in the growing U.S. trade deficit since 1980, we are not concerned with U.S. macroeconomic policies except as part of the total international environment for Japanese trade and financial relations. Nor are we concerned with the contribution of Japanese import barriers or export promotion to the U.S. trade deficit with Japan, about which there is considerable controversy.

## **Trade Balances and Exchange Rates**

### *The Trade Balances*

The total U.S. trade deficit has grown every year since 1980. In 1984 the United States had substantial trade deficits with every major trading partner or group, including Canada, the European Economic Community, Japan, the OPEC countries, and the oil-importing developing countries. In 1980, by contrast, the United States had a trade surplus with every major trading partner or group except Japan and the OPEC countries. In accounting for the large U.S. trade deficits, public attention has been centered on Japan, in part because the deficit with Japan has been larger than that with any other major trading partner and in part because of the high visibility of imports from Japan. In addition, U.S. exports of manufactures to Japan have been lower than to any other major trading partner and have averaged less than 20 percent of U.S. manufactured imports from Japan in recent years.

It is important to examine the U.S. trade balance with Japan in a historical context, because the trade balance in a given year reflects in part a structural trade relationship. The United States has had a bilateral trade deficit with Japan since 1965, and this deficit increased in most years from 1965 through 1984. It has also had a multilateral trade deficit in every year since 1975, and this deficit has increased in most years from 1975 through 1984. However, the proportion of the total trade deficit accounted for by the bilateral deficit with Japan declined from 48 percent in 1980 to 31 percent in 1984.

In every year from 1976 to 1982, the bilateral deficit with Japan on trade in manufactured goods was greater than the multilateral trade deficit in manufactured goods; in other words, the United States had a trade surplus in manufactured goods with the rest of the world, excluding Japan. But between 1980 and 1984 its multilateral trade deficit in manufactures grew by \$97 bil-



lion (see Table 1), and in 1984 it had a \$47 billion trade deficit in manufactures with the rest of the world, excluding Japan. Yet its bilateral manufacturing deficit with Japan increased by only \$25 billion between 1980 and 1984, or by 35 percent of the deterioration in its trade balance in manufactures with the rest of the world, excluding Japan (see Table 1).

A striking element in the deterioration of the U.S. trade balance between 1980 and 1984 was the decline in total U.S. exports in the face of a 32 percent increase in total U.S. imports. U.S. exports hardly changed in current dollars but declined by about 17 percent in constant dollars. During this period,

TABLE 1  
U.S. TRADE BALANCE  
(in billions of current U.S. dollars)

|                                      | Total        |              |             | Manufactured Goods <sup>a</sup> |              |             |
|--------------------------------------|--------------|--------------|-------------|---------------------------------|--------------|-------------|
|                                      | U.S. Exports | U.S. Imports | Net Exports | U.S. Exports                    | U.S. Imports | Net Exports |
| <i>U.S. Multilateral Trade</i>       |              |              |             |                                 |              |             |
| 1976                                 | 114.7        | 124.1        | -9.3        | 67.3                            | 64.6         | 2.7         |
| 1977                                 | 120.8        | 151.7        | -30.9       | 69.6                            | 76.9         | -7.3        |
| 1978                                 | 142.0        | 175.8        | -33.8       | 81.9                            | 100.1        | -18.2       |
| 1979                                 | 184.5        | 211.8        | -27.3       | 99.4                            | 110.9        | -11.6       |
| 1980                                 | 224.2        | 249.6        | -25.3       | 123.2                           | 122.4        | 0.8         |
| 1981                                 | 237.0        | 256.1        | -28.1       | 133.1                           | 139.1        | -6.0        |
| 1982                                 | 211.2        | 247.6        | -36.4       | 119.8                           | 140.3        | -20.6       |
| 1983                                 | 200.7        | 262.8        | -62.1       | 112.7                           | 159.3        | -46.6       |
| 1984                                 | 220.3        | 328.6        | -108.3      | 121.4                           | 217.9        | -96.5       |
| <i>U.S.-Japanese Bilateral Trade</i> |              |              |             |                                 |              |             |
| 1976                                 | 10.0         | 16.9         | -6.9        | 2.8                             | 16.0         | -13.2       |
| 1977                                 | 10.4         | 20.3         | -9.9        | 2.8                             | 19.2         | -16.5       |
| 1978                                 | 12.7         | 26.5         | -13.8       | 3.7                             | 25.2         | -21.6       |
| 1979                                 | 17.4         | 28.2         | -10.8       | 5.2                             | 26.8         | -21.5       |
| 1980                                 | 20.8         | 33.0         | -12.2       | 6.6                             | 31.4         | -24.7       |
| 1981                                 | 21.8         | 39.9         | -18.1       | 7.2                             | 38.1         | -31.0       |
| 1982                                 | 20.7         | 37.7         | -17.0       | 6.8                             | 38.2         | -31.3       |
| 1983                                 | 21.7         | 41.3         | -19.6       | 7.5                             | 41.5         | -34.0       |
| 1984                                 | 23.3         | 57.3         | -34.0       | 8.1                             | 57.9         | -49.8       |

<sup>a</sup> Manufactures, machinery and transport equipment, and miscellaneous manufactures.

NOTE: Figures for total trade are f.o.b. Exports of manufactured goods are f.a.s., and imports are c.i.f. (Thus, imports of manufactured goods can be larger than total imports.)

SOURCE: *Survey of Current Business*, U.S. Department of Commerce, various issues; *Highlights of U.S. Exports and Import Trade*, U.S. Department of Commerce, various issues.

however, U.S. exports to Japan rose by 12 percent in current dollars and remained at about their 1980 level in constant dollars.

These data suggest that the change in the U.S.-Japanese trade balance between 1980 and 1984 was not the major contributing factor to the deterioration of the total U.S. trade balance. Although there was a large deterioration of the U.S. trade deficit in manufactured goods over the period, the bilateral balance with Japan performed relatively better than the balance with the rest of the world, excluding Japan.

Emphasis on Japan's large bilateral surplus with the United States can be misleading. In a multilateral trading system, structural factors make for large bilateral imbalances, and an increase in the overall surplus of one country may affect bilateral balances between other countries. We should therefore ask whether the growth in Japan's trade surplus between 1980 and 1984 was in part responsible for the deterioration of the U.S. trade balance with third countries. This could occur, for example, if Western Europe's manufactured exports to Japan were diverted to the United States as a consequence of increased Japanese import barriers. There is no evidence of such diversion, however. In 1984 Japan had a multilateral trade surplus of about \$40 billion (f.o.b.), compared with \$2 billion in 1980. But the dollar values of Japan's exports and imports in trade with Western Europe and the oil-importing developing countries were remarkably stable between 1980 and 1984. About 85 percent of the improvement in Japan's trade balance between 1980 and 1984 represents the improvement in its trade balance with the United States and the OPEC countries. Therefore, it seems unlikely that the increase in Japan's overall trade surplus contributed substantially to the deterioration in the U.S. trade balance with the rest of the world.

#### *The Yen/Dollar Exchange Rate*

Many observers hold that the yen has been undervalued and the dollar overvalued since 1980 (e.g., Bergsten, 1982a, and Williamson, 1983, p. 34). Although we question the economic significance of overvaluation or undervaluation with respect to exchange rates determined in free markets, we shall nevertheless examine evidence as to whether the yen was undervalued in a global context.

The value of the yen in terms of the dollar has fluctuated widely since 1976 (see Table 2). The yen reached its highest average level in terms of the dollar in 1978 but declined sharply thereafter, and by 1980 was 7 percent below its 1978 level; by 1982 it was 15 percent below that level. In 1983, however, the dollar value of the yen rose by 5 percent, and it maintained the same average level in 1984, remaining within 5 percent of its 1980 level (Table 2).

The effective yen exchange rate (trade-weighted against fifteen major currencies) appreciated by nearly 18 percent on a nominal basis between 1980

and 1984 (annual averages). The real effective yen rate depreciated by 5 percent between 1980 and 1984, but by less than the depreciation of the Deutschmark, the French franc, and the pound sterling. Among the currencies of America's major industrial trading partners, only the Canadian dollar appreciated in real terms during this period (see Table 2). It seems difficult, therefore, to make a case that the yen weakened on a global basis between 1980 and 1984.

Between 1980 and 1984, the purchasing power of the yen, measured by consumer prices, rose by 12.5 percent relative to that of the dollar, while the nominal yen/dollar rate declined by 4.6 percent. Hence, the exchange value of the yen in terms of the dollar was undervalued by about 17 percent in 1984 measured in terms of purchasing-power parity based on 1980. In these same terms, however, the Deutschmark and the pound sterling were undervalued in relation to the dollar by 43 and 36 percent respectively (1980 = 100). While we do not regard purchasing-power parity as a significant measure of

TABLE 2  
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES  
(1980-82 average = 100)

|          | Yen/Dollar | Japan | U.S.  | France | Germany | U.K.  | Italy | Canada |
|----------|------------|-------|-------|--------|---------|-------|-------|--------|
| Nominal: |            |       |       |        |         |       |       |        |
| 1976     | 78.3       | 78.3  | 100.8 | 113.8  | 85.2    | 91.3  | 138.5 | 123.5  |
| 1977     | 86.4       | 86.8  | 100.3 | 108.1  | 91.6    | 86.2  | 117.5 | 114.0  |
| 1978     | 110.3      | 106.9 | 92.1  | 106.4  | 88.7    | 86.2  | 118.2 | 104.0  |
| 1979     | 105.9      | 99.6  | 90.8  | 106.0  | 99.9    | 90.9  | 112.8 | 100.4  |
| 1980     | 102.4      | 95.5  | 90.7  | 106.5  | 100.0   | 99.8  | 108.4 | 100.4  |
| 1981     | 105.2      | 105.8 | 99.5  | 100.4  | 97.2    | 102.1 | 98.8  | 100.2  |
| 1982     | 93.2       | 98.6  | 109.8 | 93.1   | 102.8   | 98.1  | 92.8  | 99.4   |
| 1983     | 97.7       | 107.8 | 114.2 | 87.3   | 107.6   | 91.6  | 90.3  | 100.8  |
| 1984     | 97.7       | 113.0 | 122.4 | 84.4   | 107.4   | 88.1  | 86.7  | 97.3   |
| Real:    |            |       |       |        |         |       |       |        |
| 1976     |            | 98.3  | 94.7  | 103.8  | 104.7   | 70.6  | 102.3 | 116.2  |
| 1977     |            | 103.7 | 94.0  | 101.1  | 105.6   | 74.0  | 101.1 | 108.2  |
| 1978     |            | 118.5 | 88.3  | 100.7  | 106.0   | 77.1  | 98.6  | 100.3  |
| 1979     |            | 105.7 | 88.0  | 101.2  | 107.1   | 85.2  | 100.8 | 100.5  |
| 1980     |            | 103.1 | 89.5  | 102.2  | 103.5   | 99.2  | 103.5 | 99.6   |
| 1981     |            | 104.7 | 100.7 | 100.2  | 97.4    | 101.9 | 98.7  | 100.0  |
| 1982     |            | 92.3  | 109.8 | 97.7   | 99.1    | 98.9  | 97.8  | 100.4  |
| 1983     |            | 96.6  | 112.6 | 95.9   | 99.3    | 93.0  | 100.0 | 103.0  |
| 1984     |            | 97.6  | 118.1 | 96.4   | 96.5    | 89.2  | 100.9 | 101.2  |

NOTE: Effective exchange rate trade-weighted against fifteen major currencies.

SOURCE: *World Financial Markets* (April 1984 and April 1985), Morgan Guaranty Trust Company, and International Monetary Fund, various issues.

undervaluation, these calculations provide evidence for those who do that the yen did not depreciate relative to other major currencies.

Turning to another measure, Japan's "normalized" relative unit labor costs (i.e., unit labor costs adjusted for the real effective exchange rate and for cyclical swings), the index for Japan rose by 7 percent between 1980 and 1984. This rise was larger than that for all other major industrial countries except the United States and Canada, whose indexes rose by 43 and 17 percent respectively (*International Financial Statistics*, June 1985). In fact, the indexes for most industrial countries actually declined between 1980 and 1984. This suggests that Japanese unit labor costs have not declined relative to those of most other industrial countries. When measured in dollars, Japan's unit labor cost declined by 8 percent between 1980 and 1983, as contrasted with a rise of 11 percent for the United States. But this decline was smaller than those for other major U.S. trading partners, except Canada.

The various measures discussed above suggest that while the yen may have been undervalued in terms of the dollar in 1984, it was not undervalued in terms of other major currencies. All these measures are based on changes in the relationship between nominal exchange rates and relative prices or costs from a base period (1980) when the exchange value of the yen is assumed to have been more or less consistent with balance-of-payments equilibrium. But in the absence of strong exchange-market intervention leading to a large accumulation of official reserves, or of heavy trade and exchange restrictions, by what criterion should we judge whether the value of the yen was consistent with equilibrium in 1980 or was undervalued in 1984? To say a currency is undervalued simply on the basis of the current-account surplus is arbitrary if not meaningless.

For many years, economists defined equilibrium in terms of the basic balance: the sum of the current-account balance and net long-term capital flow. It is very difficult, however, to distinguish between short-term and long-term capital movements: financial instruments defined as long-term, such as bonds and stocks, are often held for short periods of time, so that transactions in long-term assets may be quite volatile. In recent years, efforts to define equilibrium have emphasized the relationship between "internal balance" and the current account. Internal balance usually refers to the relationship between domestic savings and domestic investment. Williamson (1983, p. 14) has sought to combine these two approaches by defining a "fundamental equilibrium exchange rate" as "that which is expected to generate a current account surplus or deficit equal to the underlying capital flow over the cycle, given that the country is pursuing 'internal balance' as best it can and not restricting trade for balance of payments reasons." But Williamson's definition is unsatisfactory both because of the difficulty of distinguishing between volatile and underlying capital movements and because there are no generally accepted

objective criteria for assessing the appropriateness of a country's "internal balance" as determined by domestic financial policies.

Japan's current-account surplus in 1984 was \$35 billion, as contrasted with a current-account deficit of \$11 billion in 1980. It has been argued that Japan's large surplus reflects a substantial degree of imbalance between domestic savings and investment that has given rise to portfolio shifts unrelated to real capital outflows. The nature of Japan's internal imbalance and its relationship to Japan's balance of payments will be examined below. Before taking up that subject, however, we will examine Japanese financial policies. In the absence of strong intervention in the exchange market, the exchange value of the yen is determined by the domestic policies of all major trading countries. Rather than ask whether the yen is undervalued, we therefore ask whether Japan's domestic financial policies are compatible with what may be regarded as a *desirable* framework for global balance-of-payments relationships.

### **Japanese Financial Policies**

Japanese financial policies are believed to have reduced the exchange value of the yen and increased Japan's current-account surplus. These policies are said to include intervention in the foreign-exchange market, fiscal restraint combined with an expansionist monetary policy, and capital and credit controls that encourage capital exports. Japanese policies in each of these areas are examined in this section. It should be observed, however, that except for exchange-market intervention and direct controls over domestic and international financial transactions, the effects of domestic financial policies on the balance of payments of an individual country must be considered in the context of the financial policies of its major trading partners. In addition, they must be evaluated in relation to structural conditions within the country, such as the relationship between domestic savings and investment.

#### *Intervention Policy*

Some critics of Japanese policies, including spokesmen for the National Association of Manufacturers and the United Auto Workers (GAO, 1984, p. 38) have suggested that the Bank of Japan has pursued an intervention policy designed to maintain a relatively "low" yen value in order to promote Japan's export competitiveness. Testimony to this effect submitted to the Subcommittee on International Finance and Monetary Policy in its Hearings on Japanese-U.S. Trade in 1982 led the Subcommittee to request that the General Accounting Office undertake a study of Japanese foreign-exchange operations over the past ten years. The resulting report (GAO, 1984), as well as a number of other studies, do not support the view that Japanese intervention has systematically depressed the dollar value of the yen. The Bank of Japan's ex-

change-rate objectives have varied over the last decade. At times the Bank has defended a target rate, as in July 1978, when it sought to prevent the yen from rising above the ¥200-per-dollar level. However, the evidence suggests that the Bank's predominant policy has been "leaning against the wind."

Table 3 shows two measures of Japanese exchange-market intervention: gross changes in official Japanese reserves, and changes in the Japanese foreign-exchange-fund accounts.<sup>1</sup> Both measures show that the Bank of Japan has tended to buy yen when the yen is depreciating and sell yen when it is appreciating. For example, the 7.3 percent drop in the yen following the oil price shock in the fourth quarter of 1979 was met with heavy support operations by the Bank of Japan, as indicated by a \$5 billion decline in official reserves and a decline of \$6.2 billion in the foreign-exchange-funds account. In 1982 Japan lost almost \$5 billion in reserves in an attempt to slow the decline in the yen against the dollar, while the foreign-exchange-funds measure that year shows that the Bank's intervention was even greater than the reserve loss: the Japanese authorities sold \$8.9 billion (net) of foreign exchange. By contrast, during 1983 and the first quarter of 1984, a period when the yen was usually appreciating against the dollar, Japan acquired almost \$2 billion in official reserves in order to moderate the appreciation.

Regression evidence derived from estimating intervention functions for the Bank of Japan also indicates that its policy was to lean against the wind. Argy (1982) estimated that the Bank of Japan bought or sold an average of \$210 million in the current month in response to a 1 percent appreciation or depreciation in the effective trade-weighted value of the yen; his study covered the period March 1973 to December 1979. Similarly, Hutchison (1984) estimated that the Bank of Japan bought or sold approximately \$167 million in the current month in response to a 1 percent appreciation or depreciation of the dollar value of the yen; this study covered the March 1973 to October 1981 period. Fried and Trezise (1983) argue that Japan moved to support the yen against the dollar in 1981-82, both by intervention in the foreign-exchange market and by restricting outflows of foreign capital.

While leaning against the wind may influence the exchange rate in the short term, this sort of intervention has little effect over extended periods; intervention on both sides of the market tends to cancel out. The intent of the

<sup>1</sup> The change in foreign-exchange funds differs from the corresponding change in gross international reserves by (1) including the change in official deposits of foreign exchange with commercial banks (the so-called "hidden reserves") and (2) excluding transactions that are conducted outside the foreign-exchange market. Including official Bank of Japan deposits of foreign exchange with commercial banks is useful. Upon occasion, Japan has used "hidden reserves" to conceal its spot foreign-exchange purchases by having a commercial bank buy or sell for the Bank of Japan in the commercial bank's name (Taylor, 1982, p. 70). The excluded extramarket transactions, comprised of earnings on official reserve assets and of receipts from U.S. military transactions, do not represent active Bank of Japan intervention.

TABLE 3  
 OFFICIAL JAPANESE INTERVENTION IN THE FOREIGN-EXCHANGE MARKET:  
 CHANGES IN RESERVES, FOREIGN-EXCHANGE FUNDS, AND EXCHANGE-RATE  
 (dollar figures in billions)

|         | Gross Change in<br>Official Reserves<br>(less gold) <sup>a</sup> | Change in the<br>Foreign-Exchange<br>Funds Account <sup>b</sup> | Percent Change in<br>Yen/Dollar<br>Exchange-Rate <sup>c</sup> |
|---------|--|---|---|
| 1974    | \$1.3  | -\$1.3  | 7.5%  |
| 1975    | -0.6   | -2.1  | 1.4   |
| 1976    | 3.8  | 2.6   | -4.0  |
| 1977    | 6.6  | 6.2   | -18.0   |
| 1978: I | 6.3  | 7.7   | -7.3  |
| II      | -1.9   | 1.1   | -7.9  |
| III     | 1.9  | 2.9   | -7.6  |
| IV      | 3.8  | 3.1   | 2.9   |
| 1979: I | -4.2   | -3.9  | 7.5   |
| II      | -4.1   | -4.1  | 3.7   |
| III     | 0.4  | 0.8   | 2.9   |
| IV      | -5.0   | -6.2  | 7.3   |
| 1980: I | -1.8   | -3.7  | 4.2   |
| II      | 4.1  | 2.4   | -12.8   |
| III     | 1.1  | 0.9   | -2.5  |
| IV      | 1.6  | 1.2   | -4.3  |
| 1981: I | 1.9  | 1.5   | 3.9   |
| II      | 1.0  | 0.3   | 7.0   |
| III     | 0.2  | -1.1  | 3.1   |
| IV      | 0.6  | -0.6  | -5.5  |
| 1982: I | -1.1   | -1.9  | 12.1  |
| II      | -1.7   | -2.6  | 3.0   |
| III     | -1.4   | -2.5  | 6.1   |
| IV      | -0.7   | -1.9  | -12.8   |
| 1983: I | 0.9  | 0.2   | 1.9   |
| II      | 0.9  | 0.1   | 0.1   |
| III     | -0.1   | -0.5  | -1.5  |
| IV      | -0.4   | 0.0   | -1.7  |
| 1984: I | 0.6  | 0.1   | -3.2  |
| II      | 0.1  | -0.5  | 5.7   |
| III     | 0.3  | -0.6  | 3.4   |
| IV      | 0.8  | 0.0   | 2.3   |

<sup>a</sup> *International Financial Statistics*, various issues.

<sup>b</sup> Bank of Japan, *Economic Statistics Monthly* (April 1985), Table 7. The flow of foreign-exchange funds is converted to dollars with period average yen/dollar exchange-rate data. Obtaining the dollar flow of funds by first differencing end-of-period outstanding stocks (after converting to dollars with end-of-period exchange-rate data) is not possible since end-of-period stock data are not available.

<sup>c</sup> Percent change in end-of-period yen/dollar exchange rates. Minus sign indicates appreciation of the yen.

policy is to slow but not reverse exchange-rate movements in the short run, in order to reduce exchange-rate volatility, while not interfering with longer-term trends. Admittedly, it is difficult to distinguish empirically between such behavior and episodes in which the Bank of Japan intended to hold the line on the yen but gave up when the cost became too great. Nonetheless, there is no evidence that the Bank has intervened systematically in recent years to depress the yen. Moreover, the scale of the Bank's intervention has been markedly smaller since 1983 than in previous years, as indicated in Table 3. The scale of the Bank's intervention and the size of Japan's foreign-exchange reserves are exceedingly small in relation to the total volume of transactions on the Japanese foreign-exchange market. In 1982, for example, the volume of Japanese interbank trading in all currencies totaled \$1,285 billion, and direct yen/dollar trading was \$1,186 billion (Hama, 1983, p. 27). By contrast, Japan's reserves totaled only \$23 billion at the end of 1982.

The absence of a trend in the foreign-exchange portion of Japan's official reserves is further evidence that the Japanese authorities did not systematically intervene to depress the value of the yen. At the end of 1980, Japan's official foreign-exchange holdings totaled \$21.6 billion, rising to \$24.7 billion at the end of 1981, and declining to \$19.2 billion at the end of 1982. At the end of 1984, they stood at \$22.3 billion. The other components of Japan's reserves have either remained constant, as in the case of gold, or fluctuated passively in response to transactions initiated by others, as in the case of Japan's SDR holdings and reserve position in the IMF (*International Financial Statistics*, various issues).

Furthermore, Japan's official intervention in the foreign-exchange market is unlikely to have had a significant impact on the exchange rate because it has not been allowed to influence the monetary base—that is, intervention operations have been sterilized. This means that purchases or sales of foreign exchange by the central bank are accompanied by offsetting sales or purchases of domestic bonds, leaving the reserves of commercial banks unchanged. Nonsterilized intervention is likely to have a much greater effect on the exchange rate than sterilized intervention, because the former involves an increase or decrease in the domestic money supply, which in turn magnifies the effect on the exchange rate resulting from an official purchase or sale of foreign exchange.

Empirical evidence that the Bank of Japan routinely sterilizes its intervention operations is provided by estimates of the "sterilization coefficient." A sterilization coefficient equal to minus 1 indicates that the monetary base is totally insulated from the central bank's foreign-exchange operations. A coefficient equal to 0, by contrast, indicates that intervention is allowed to have its full effect on the money supply—official intervention is totally nonsteri-