

WILL JAPAN'S CURRENT  
ACCOUNT TURN TO DEFICIT?

by

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## Abstract

The Japanese current account has been in surplus since 1981, ranging from 1% to more than 4% of GDP. In this paper, we review the macroeconomic forces that have driven the surplus and describe likely changes in the first part of the next century. In coming years, structural change in Japan's economy—population aging, the globalization of production, and financial market reforms—will alter the underlying determinants of the surplus. While the net effect of these forces is difficult to predict, the most likely outcome is a gradual closing of the current account gap. We use large-model simulation analysis to evaluate the potential for specific developments to alter the current account, and we assess their likely impact on the Japanese economy.

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## 1. Introduction

Japan's current account has been in surplus for many years. From a Japanese perspective, the surplus has provided market outlets for Japanese manufactures and high tech products and has been the basis for capital flows into foreign investment. From the perspective of other industrial countries, the surplus has represented a source of cheap foreign savings, but has also created political pressure through job losses in import-competing sectors. The Japanese surplus has been attributed to the structure of the Japanese economy: its high savings rate, its promotion of exports of manufactures, and, until recently, its reluctance to accept imports.

While the relative size of Japan's surplus has fluctuated since the early 1980s, it has remained in surplus territory, with the broadest measure of trade balance, the current account, ranging from 1% to more than 4% of GDP. (Figure 1.) The surplus receded in the late 1980s, following the dollar collapse mid-decade and an investment boom in Japan. But it picked up again with the end of the bubble economy, and the subsequent economic recovery in the U.S. (See the discussion in Adams and Gangnes, 1996.) Following the yen's appreciation of 1993 to 1995 and some moderate recovery of the Japanese economy in the mid 1990s, the surplus once more fell back toward near balance measured in yen; though the politically-sensitive dollar merchandise trade surplus remained in the \$80 billion range. The surplus has risen again recently, as robust U.S. growth has continued and Japan's economy has faltered. While the Asian crisis has hit Japanese exports to the East Asian region, the surplus is likely to widen further as a result of the deep Japanese downturn that began in 1998.

The threat of an ever-widening Japanese surplus might be a matter of economic and political concern but for several developments likely to bring about an eventual narrowing of the trade gap. In the medium term, economic recovery in Japan will eliminate a large cyclical component of the surplus. Over the longer term, structural change in Japan's economy—

population aging, the globalization of production, and financial market reforms—will alter the underlying determinants of the surplus.

The future path of Japan's current account balance has implications for Japan's economy domestically, for international political economy and for global capital markets. For the domestic economy, a reduction in the current account surplus would negatively impact aggregate demand. There is also likely to be a redistribution of economic activity across sectors. Changes in trade balances and the industrial mix would require potentially painful adjustments in industrial and labor markets. These effects of trade adjustment could generate political resistance in Japan not unlike what we observed in the U.S. in the 1980s.

From an international perspective, however, reduction of the Japanese trade surplus would ease political pressures. Arguments that the large surplus has enabled Japan to export its potential unemployment have served as a basis for imposing restrictions on Japanese exports in many markets. A decline in Japan's surplus trade balance would be welcomed by Japan's trading partners. On the other hand, Japan has recycled its trade surpluses as capital outflows to both the developed and developing world. A reduction in Japanese capital outflows would change the global savings-investment balance, probably raising world interest rates.

This paper looks at the prospects for Japanese current account balance adjustment in coming years. In section 2, we describe the macroeconomic forces driving the trade surplus. We distinguish between the long-run structural surplus and short-run cyclical movements. In section 3, we describe fundamental changes in Japan likely to influence the path of the trade balance in the first decades of the next century. Section 4 uses simulation analysis to study aspects of these changes and to assess their potential impact on the Japanese economy. We make concluding comments in section 5.

## 2. The macroeconomics of Japan's current account

We can learn something about the origin of the Japanese surplus and its future prospects by examining the surplus in the light of a simple conceptual model of the balance of payments. This model, incorporating both real and financial influences on the payments position, is useful for understanding medium term current account adjustment and the determination of the long run equilibrium path.<sup>1</sup>

The forces operating on the current account can be viewed from two perspectives, the trade perspective and the capital flow perspective. Abstracting from unilateral transfers, the current account equals the goods and services trade balance (NX) which reflects demand in the domestic economy (Y), foreign demand ( $Y_f$ ), relative prices and the exchange rate ( $P/P_f^*XR$ ) acting on exports and imports:

$$NX = f(Y, Y_f, P/P_f^*XR). \quad (1)$$

The long-term evolution of trade flows is driven by growth in incomes and changes in relative competitiveness, as well as any change in the propensity to import at home and abroad. Business-cycle fluctuations in income and misalignments of the real exchange rate can exert strong influences on net exports in the medium run. In the Japanese case, import propensities have not been high, nor have trade flows been particularly sensitive to relative price or exchange rate movements. In part this reflects the strength of Japanese brands in export markets and, until recently, the difficulties of foreign producers in selling imported products in the Japanese market. Japanese firms have also tended to resist "passing through" to customers the effect of exchange rate appreciation, further limiting current account adjustment. (Marston, 1990; Knetter, 1993.)

From the capital flow perspective, the surplus on NX represents the supply of foreign exchange, which must equal net demand for foreign exchange, comprising private capital outflows (CF) and changes in official reserves (dR):

$$NX = CF + dR. \quad (2)$$

Capital outflows (CF) represent net additions to holdings of foreign assets. The demand for these assets depends on the available flow of saving (the overall rate of asset accumulation) in the domestic economy ( $S$ ) and relative rates of return at home and abroad adjusted for the exchange rate and expectations about future exchange rate change ( $i$ ,  $i_f$ ,  $XR$ ,  $dXR^e$ ):<sup>2</sup>

$$CF = f(S, i, i_f, XR, dXR^e) \quad (3)$$

Other factors that affect the desired asset mix will also affect capital flows. Strong demand for foreign assets can produce a capital outflow from the home country and therefore contribute to a current account surplus. This appears to have been an important part of the story behind the yen's relative weakness between 1995 and 1998. Japanese investors displayed a continuing desire to accumulate foreign assets, driving down the value of the home currency and helping to generate a rising net export surplus.

The current account then depends on the interplay of international trade and competitiveness with underlying determinants of saving and asset allocation. The balance of payments relationships (1) through (3) are part of the broader macroeconomic system that includes domestic and foreign goods markets, financial relationships, and factor markets. In the absence of exchange rate intervention, equilibrium for the complete economic system entails the simultaneous determination of the remaining endogenous variables, including income, interest rates, exchange rates and prices.

There are important differences in the macroeconomic adjustment process between the short run and the long run. In the short run, changes in the trade conditions, or in demand for foreign assets will impact the exchange rate and net exports. For example, an exogenously caused change in net exports will alter GDP and induce additional changes in savings and import demand. The current account both affects and is affected by business cycle conditions. In the long run, saving depends on intertemporal preferences for consumption relative to expected lifetime resources, as in the life cycle model (Modigliani, 1966). Changes in international relative prices and interest rates will cause the excess of

domestic saving over domestic investment at full employment to flow into international capital markets.<sup>3</sup> In this way, long-term trends in net savings imply a corresponding pattern for the current account balance (Razin, 1995, and Obstfeld and Rogoff, 1996.)

Intertemporal choice by Japanese residents may explain much of the persistent surpluses.<sup>4</sup> As is noted in Mason and Ogawa (this volume), Japanese demographic characteristics and institutions have favored high private savings in the Post-War period. Since the 1950s, the age composition of Japanese society has shifted dramatically toward the prime income earning age groups and savings rates have risen. Current high savings rates, only a little below their 1980s peaks, may then reflect in part high levels of life cycle savings by the post war generation now in its peak earning years. Econometric models based on life-cycle consumption theory frequently find a significant negative savings effect from both youth and old age dependency ratios.<sup>5</sup> Further aging of the economy of course has implications for the future course of Japanese savings, an issue we will take up in section 3. (For a wide-ranging discussion of factors behind Japan's high savings rate, also see Horioka, 1990.)

The very fact that the Japanese economy was growing rapidly in the post-war period may explain high rates of savings. For most countries, the literature finds a tight link between rates of economic growth and rates of savings. (See, for example, Bosworth, 1993, p. 72, and Adams and Prazmowski, 1996.) In part, this may reflect the fact that rapidly-growing populations have demographics that favor increased savings. But it may also reflect workers' desire to accumulate retirement wealth sufficient to support the higher living standards expected in the future, or simply an adjustment lag as households adapt to increased consumption opportunities. In any event, the implication is that slower growth in the future would mean lower saving.

Government saving or dissaving also has implications for Japan's balance of payments.<sup>6</sup> A number of writers have observed a link between government budget balances in the U.S. and Japan and the emergence of large current account imbalances in the 1980s.

(See, for example, Krugman and Obstfeld, 1997, p. 313, and Bergsten and Noland, 1993.) However, recent experience suggests a weaker link between government and national savings. There has already been a massive reversal of public sector saving in Japan, from surpluses in the 1980s and early 1990s to deficits running some 10 percent of GDP at present. And further deficit financing is intended to boost the lagging Japanese economy. Still the current account surplus remains wide. Expectations of future tax liabilities may be encouraging higher private sector savings. No matter what one thinks of the doctrinaire Ricardian equivalence proposition, the Japanese government's on again, off again imposition of temporary tax cuts would make even the most spend-thrift Japanese consumer cautious about spending all of the tax reductions.

Aside from these long-run considerations, cyclical factors have bolstered the Japanese surplus. Economic stagnation during the 1990s has limited the demand for all goods, including imports, raising the current account surplus above the level that would prevail at full employment. The yen's recent weakness may push the surplus up further, although this will be mitigated by weaker demand by Asian developing economies for Japanese exports.

An indication of the role of cyclical factors in the Japanese current account surplus can be obtained using a counterfactual simulation of recent Japanese macroeconomic experience. We have simulated a path for the Japanese economy during the period 1992-1998, using the Japanese Long-term Model, described in greater detail in section 4, below. The simulation imposes a flat path for the yen/dollar exchange rate at 128, its value in 1991, eliminating the appreciation/depreciation cycle over the period. Parallel adjustments were made against other currencies. Japanese private consumption was adjusted to maintain approximately a 3% annual growth rate of real Gross National Expenditure (GNE), a much more rapid rate of growth than the 0.9% actually experienced. The cyclically adjusted current account path is graphed alongside the actual path in Figure 2. Weak Japanese growth in the early 90s and a steadily appreciating currency contributed \$30 billion to \$40 billion to the current account balance in that period. This difference jumps in 1995 with the sharp



transitory move to 85 yen/dollar. In 1996 the current account path was above its potential path because of the one-time growth surge associated with changes in Japanese consumption taxes. In 1998, about \$23 billion dollars (1% of GNE) separates projected actual and cyclically adjusted paths.

Macroeconomic stabilization policies are an important influence on the business cycle path. The Japanese experience of the 1990s provides ample evidence of the importance of Keynesian views about the role of fiscal and monetary policy during recession (Krugman, 1998). Monetary policy has been driven to its limit, with extremely low interest rates—which at the same time make unlikely further monetary policy stimulus and reduce returns to assets in Japan, encouraging asset flows abroad.<sup>7</sup> Fiscal policy, on the other hand, provided substantial stimulus in the mid-1990s, only to be turned off in 1997 by tax increases in a vain effort to balance the budget, with the anticipated negative effect on demand. Below we take a look at the role for policy in Japanese recovery by simulating the effects of fiscal stimulus to move the economy toward a full-employment growth path.

The discussion in this section leads us to draw the following conclusions about Japan's recent current account experience:

- The balance of payments surplus has reflected the continued competitiveness of Japanese manufactures in the world market and, perhaps, the difficulties encountered by competitors to introduce their products into Japan.
- The persistence of the surplus reflects the large Japanese demand for foreign assets, a large volume of saving seeking outlets at higher returns abroad than at home. This strong foreign asset demand stems in part from life-cycle motives for high savings, and perhaps also the attractiveness of foreign investment opportunities.
- As a consequence, the equilibrium exchange rate has not adjusted to eliminate the current account surplus.
- The continued positive balance provides demand for products of the Japanese economy. On one hand, the surplus is the result of a depressed economy, on the other, the Japanese cyclical situation would be considerably worse but for the surplus.

### 3. The future of Japan's current account surplus

Many of the underpinnings of Japan's high rate of saving and current account surplus are likely to undergo substantial change over the next 10-25 years. Demographics that have favored rapid wealth accumulation will gradually be replaced by an aging population's need to draw down net savings. The structure of Japanese production and consumption is moving toward greater specialization on high tech products and services and to increased reliance on imports of low- and medium-tech manufactures, perhaps raising Japan's overall import propensities. Deregulation of financial markets will eliminate many barriers to the free flow of international capital, with potential implications for the capital account. While there are considerable uncertainties, these changes are likely to produce a smaller, rather than larger, trade surplus.

#### 3.1 The aging economy

The changes about which we know the most are the demographic ones. As has been discussed at length in Mason and Ogawa (this volume), the aging process will accelerate in coming years, so that by 2025, 32 percent of Japan's population will be over the age of 65, and the youth dependency ratio will fall to 19%. (United Nations, 1994.)<sup>8</sup> While the process of change will be gradual, with only small changes perceptible during the next decade, these changes may ultimately have profound impacts.

##### *A smaller labor force*

A gradual decrease in the labor force is already under way as new entrants fail to replace those who leave it through death or retirement. In the short run, entries into the labor force are largely known, given the age distribution of the youth population. There remains uncertainty with respect to the length of time young people remain as students, the labor force participation of women, and immigration. Forecasting exits from the labor force is more problematic because increased demand for labor and changes in retirement and

pension policies may lengthen working life. On the other hand, the proportion of the elderly who work in Japan is unusually high, and recent trends have been toward earlier retirement.

The implications of declining labor force translate into a tighter labor market constraint assuming there is no corresponding change on the demand side. In the short run, assuming a business cycle recovery, slower labor force growth means tighter labor market conditions and wage cost pressures that may limit expansion and reduce Japan's international competitiveness. In the long run, the economy may adjust with rising wages relative to the return to capital. Slower labor force growth almost certainly means slower aggregate economic growth in Japan, although not a reduction in *per capita* growth.

#### *Changes in aggregate saving and investment*

A number of studies have projected the effect of aging on Japan's savings and investment. Because of differences in methodology and underlying assumptions, the studies give conflicting results. (See Mason and Ogawa, this volume, and Yashiro and Oishi, 1997.) On the saving side, there are great difficulties in forecasting saving propensities in a world where more people are getting into the "high saving ages" before retirement, at the same time that more of them are retiring and living longer, a period of *dissaving*. There may also be changes in intergenerational family relationships or in public pension systems that affect retirement savings. The studies differ in their focus on private or national savings, and, in the case of the latter, their assumptions about fiscal policy. The consensus points to a likely reduction in the Japanese saving rate as the population ages.<sup>9</sup> This transformation is not unique to Japan, but its pace and extent are unusual. On this basis alone, one would expect the current account to narrow in coming years.

It is the balance of savings and investment that will determine the long run evolution of Japan's current account. An older population and a declining labor force will favor less capital formation, because of lower demands for capital to equip new entrants to the work force. Also, fewer people will reach the age for family formation, reducing the demand for

residential investment. On the other hand, increasing consumption propensities that accompany population aging may fuel a rise in investment spending, at least within the medium-term horizon of traditional macroeconomic forecasting. The net response of investment depends importantly on assumptions about how labor productivity will change with a declining labor force and the degree of international capital mobility, which affects the evolution of investment returns. (Yashiro and Oishi, 1997.)

The consensus appears to favor a reduction in Japanese investment, but at a slower rate of decline than savings. Assuming a return to prosperity, the external balance will show smaller surpluses in coming decades.<sup>10</sup>

#### *Change in the composition of expenditures*

Changes in the composition of expenditures as the population ages may affect the industrial structure and trade, quite apart from changes in aggregate demand or the overall savings-investment balance. An older population spends its income on a higher proportion of personal and professional services (for example medical services, nursing home care, and perhaps tourism and leisure activities) and a lower fraction of durable goods, which have presumably been accumulated at earlier stages of the life cycle. This shift toward services almost certainly means a shift toward domestically-produced goods and away from tradable goods, requiring significant structural adjustment of production to meet the new demands. In the case of Japan, an economy where labor is relatively scarce, a shift toward labor intensive demand will aggravate labor market pressures. In addition, an aging society will make differing demands on government, requiring larger outlays for medical services and pensions, with reduced spending on education. (See Masson and Tryon, 1990, and Heller, 1986.) These changes may ultimately have adverse impacts on aggregate growth as well as their sectoral effects.

### 3.2 Japan's changing relationship with Asia

The Japanese economy is closely tied to other East Asian economies, both as a supplier of capital and goods and services and as a purchaser. As East Asia has advanced up the "development ladder," this interaction has tended to expand and to change. (Adams and Shachmurove, 1997.) The ability of the developing Asian economies to produce high quality consumer products at low cost has given them a competitive advantage in many product lines, beginning some years ago with processed foods and apparel and proceeding more recently to consumer electronics, automobiles, and other more sophisticated products. Japan has supplied parts and capital goods to the burgeoning industries of East Asia.

As an importer of East Asian products, Japan has lagged behind the United States and Western Europe, who have drawn increasing shares of their mass production consumer products from East Asia. In fact, Japanese consumption overall has been disproportionately served by domestic production, illustrated by the low Japanese import propensities compared with other developed economies. (See Figure 3.) Some evidence that this has begun to change can be seen in the upward trend in import propensities in the past decade and in the shift of imports from Asia to manufactured goods and high-tech capital goods. Japan is turning increasingly toward East Asia as a purchaser as well as a supplier.

Table 2 provides a rough breakdown of trade categories by resource intensity. Note that the labor and land intensive products may be best suited for countries at early stages of development. In turn, the high tech category is clearly most appropriate for countries like Japan that lack land, labor, and other resources, but have physical and human capital. The composition of trade flows from and into Japan by principal sector in 1980 and in 1992 is then compared to comparable flows for Europe and the United States in Table 3. This table provides an indication of trends that may be anticipated to continue in the next decade.

Japanese imports and exports have changed in composition over the 1980 to 1992 time period. Imports in 1992 have a substantially higher content of mass produced and high tech products (the 5 and 6 categories) than in 1980. A similar change, of smaller dimension, is

apparent in Japanese exports, which are predominantly in the high tech category in 1992. Japan still lags far behind the United States and Europe in its imports of high tech goods, though it is catching up in imports of industrial materials and mass production manufactures. In 1992, industrial materials and mass production manufactures accounted for 25.6%, 26.4% and 35.8 % of imports in Japan, the United States, and Europe, respectively; high tech products account for 23.3%, 54.2%, and 43.5% in the three regions.

It is likely that imports of industrial materials and mass production manufactures will continue to increase over the next decade. This prediction reflects two parallel developments. First, Japanese producers are expected to continue to expand production of parts and intermediate materials in East Asia for shipment to their assembly operations in Japan. This shift from domestic industries toward foreign suppliers reflects shifting comparative advantage conditions in recent years, as Japan's production costs have risen relative to Asian developing economies. The current crisis in East Asia may accelerate this process by increasing the price competitiveness of offshore plants.<sup>11</sup> Second, Japanese inward foreign investment, which has been nearly negligible so far, is likely to increase. (See Blomstrom, Konan and Lipsey (this volume).) If patterns observed in other countries hold, foreign firms in Japan will rely heavily on intra-firm trade with the parent firm and its overseas subsidiaries. This will further raise Japanese imports of materials and manufactured products.

These changes will affect the total volume of imports as well as their composition. The sectoral, regional, and employment impacts are likely to be more severe than the effects on aggregate GDP and related measures of economic performance.<sup>12</sup> Industries like steel, auto parts, apparel, and small electronics are likely to be hurt. The workers displaced may not easily find alternative employment. Since these industries are concentrated geographically as well as sectorally, the burden of adjusting to these changes may be heavy in some localities.

### 3.3 Institutional change in financial markets and financial institutions

Important changes in Japan's financial markets and financial institutions are under way. The details of these changes and their implications are discussed in Ito and Melvin (this volume).<sup>13</sup> At least in principle, the evolution in financial markets has the potential to affect Japan's external balance by changing domestic savings behavior and incentives for international capital flows. Because of the scope of ongoing changes and the complexity of likely economic responses to those changes, it is difficult to draw firm conclusions regarding their macroeconomic and balance of payments effect.

In 1996, the Japanese government announced the beginning of a comprehensive program of financial market reform, dubbed, as in the United Kingdom, the *Big Bang*. The aim: to transform a highly restrictive, costly, and rule-bound financial system that had fallen behind technologically and operationally; the objective: to create in Tokyo a market that would be open, global, and competitive, to match markets operating in East Asia and, perhaps optimistically, in New York and London. The proposed steps remove regulatory barriers between various types of financial institutions and allow development of new financial products like derivatives. They increase financial transparency. There are also proposals to remove restrictions on foreign exchange and on portfolio holdings, both domestic and foreign. Legally, all the requisite measures should be in place by 2001, but it is likely to take many years before they are fully operational. Moreover, they are coming at a time when the Japanese financial system is in great difficulty that may complicate their implementation. (Taniuchi, 1997.)

Despite the likely delays, some measures are already in force, and some international financial companies have already drawn on them to expand their operations into the Japanese market. Viewing Japanese financial markets from a dynamic perspective, over a span of many years, the *Big Bang* measures are likely to greatly intensify competition. The resulting shakeout can be expected to accelerate the pace of financial innovation, to improve economies of scale,

and to reduce costs. Foreign financial institutions, whose expertise and experience far exceeds that of Japanese firms, are likely to be important beneficiaries. (Dekle, 1997, p. 243.)

Of particular importance to our discussion are the liberalization in the assets that may be held by pension funds, insurance companies and banks, and the amendment of the foreign exchange law to allow unrestricted holdings of foreign assets. The range of assets available to Japanese security holders will expand considerably, and it is highly likely that they will want to increase their holdings of foreign securities and accounts.

It is difficult, however, to pin down the macroeconomic impacts and balance of payments impacts. There are likely to be financial flows both in and out. Initially, Japanese financial markets will represent a target of opportunity for foreign financial enterprises, drawing a substantial capital investment into the market for a period of time. On the other hand, there is reason to expect net financial outflows. Security yields in Japan have been low by world standards and could go lower as competition and market efficiency increase. Diversification into high return securities, many of them foreign, is likely to increase, and that will mean significant incentives for financial outflows at least until an equilibrium in asset holdings has been attained. On balance, this will mean outflows of capital, on top of the already large acquisition of foreign assets that is ongoing.

Will these changes increase aggregate saving? In view of the high personal savings rate that already prevails and because other considerations are likely to be more important, it is not likely that much higher saving rates will occur. More probably there will be diversion of funds from traditional domestic uses to mutual funds investing in equities at home and abroad. Ultimately some increase in Japanese interest rates—convergence to higher rates prevailing abroad—is likely, perhaps accompanied in the interim by a downward realignment of the yen.

While the impacts may not be large in terms of the macro economy, they may be very significant for sectoral development, for example for the financial sector and for development of capital intensive high tech sectors. The financial sector is likely to expand greatly, with



more active underwriting and trading, on the model of the effect of the *Big Bang* in London, though we have no illusions that Tokyo will rival London for many years to come. For sectors that require capital, interest rates may be higher, more in line with world standards, but there may be greater availability of funds for venture capital type enterprises. Greater financial market efficiency may raise productivity in important sectors of the economy.

#### 4. How Japan will change: the implications of adjustment

The results of the previous section make clear that predicting the path of Japan's current account and its implications is far from simple. In the absence of other developments, aging of Japan's population will lead to a decline in savings, which will likely exceed any fall in investment, and therefore reduce the surplus. But other developments may intervene, particularly financial opening, which may cause more savings to flow abroad, presumably out of a smaller total. While the latter development may affect the value of the yen and the pace of trade adjustment, the consensus view clearly favors an eventual movement to a lower current account path. In this section we use simulation analysis to consider the implications for the Japanese economy of forces acting on the current account.<sup>14</sup>

The process of adjustment to a lower current account balance would involve changes at the macroeconomic level but also in the structure of the domestic economy. A surplus country moving toward balance experiences an increase in spending relative to income, and a shift of production from tradable to non-tradable goods. The industry composition of output changes in response to changing total spending and relative prices, so that the leading industries for the surplus period may not be leading industries for a later period. These adjustments in economic structure need not be problematic with sufficiently flexible labor markets; resources would merely flow out of tradable and into non-tradable goods. In reality, there are likely to be significant short-run economic dislocations associated with these adjustments.

#### 4.1 Simulating the adjustment process

The simulation model employed in this analysis is the Japan Long-term Model (JLM), an econometric model of the Japanese economy, developed by Shuntaro Shishido. (Adams and Shishido, 1988; Adams, Gangnes and Shishido, 1993.) The JLM model is a macroeconomic forecasting model with industrially disaggregated production, employment and trade sectors. Such a model represents the economy on the computer in terms of, literally, thousands of interrelated behavioral, technical, and accounting relationships. It can be used to forecast and to evaluate macroeconomic adjustment. It also provides information on how the gains and burdens of adjustment are distributed among the various sectors of the economy. In other words, it provides a consistent picture of potential developments at the macro level and of their implications at the industry micro level. In many previous applications the JLM has been integrated into a world model system, Project LINK. But in the interest of clarity, for the present analysis the JLM is solved as a “stand alone” model with explicit assumptions about developments in the rest of the world.

A detailed exposition of the JLM model is beyond the scope of this paper. Here, we describe the model in general terms, with an emphasis on trade flows and adjustment. (See the references above for more complete presentations.) Structurally, the macro core of the JLM model combines Keynesian-type expenditure relationships and a Leontief inter-industry system with important supply-side constraints. In the short-run, equilibrium is largely demand-determined. Demand, including net exports, determines production levels in each industry and the employment needed to produce this output. Labor market conditions determine wage growth, which together with excess demand conditions drives price inflation. Income growth feeds back to affect final demand, while wage and price changes influence final demand, production costs and employment growth.

Over the longer term, the dynamics of the model are driven by capital accumulation and population growth. A demographic model determines the evolution of population and the labor force. Investment, determined in part by endogenous technical progress, generates

capital accumulation and resulting changes in productive capacity. The monetary and fiscal sectors of the economy are fully modeled. With regard to the balance of payments, exports and imports are modeled at the industry level as functions of income and international competitiveness. As we have noted, net trade quantities directly affect demand for industry output. Import prices affect industry input costs. Aggregation of trade prices and quantities produces aggregate values for the trade balance and also affects other key macroeconomic variables.

Trade adjustment in the model comes about through changes in absorption and relative prices acting on the import and export equations. The sources of such change range from direct movements in income under a fiscal expansion to relative price changes associated with exchange rate realignment or changes in domestic inflation. Income and price elasticities influence the extent of adjustment, as do the multiplier properties of the model and the nature of inter-industry linkages. Japanese export price equations incorporate varying degrees of pricing-to-market behavior when exchange rates change, limiting the extent of actual relative price movement. Changes in national price levels also create real money balance and wealth effects that further effect absorption and trade balance adjustment.

We evaluate the impact of policy changes and developments using forecast simulations of the JLM model. The simulation analysis is conducted by first establishing a baseline forecast for the period 1999-2005, assuming no significant changes in policy or the economic environment. The model is then re-solved with one or more changes in exogenous assumptions. Simulation results can then be compared to the baseline forecast path.

There are important limitations to the model and to this analysis. In this model, as in many macro systems, the current account is determined by trade response. There is no explicit modeling of the capital account or of its impact on the exchange rate. In other words, the model does not contain the asset demand/portfolio balance features of capital flow determination that we have noted above. The effects of capital flows on exchange rates must be handled through appropriate assumptions, and corresponding exchange rate

adjustments must be made. The fiscal and monetary policy posture also requires judgmental adjustment. There are, moreover, no automatic mechanisms to enforce current account sustainability, absent appropriate assumptions by the modeler. To achieve a realistic picture of real world developments, great care must be taken to assure that structural changes that are handled by the model are matched by appropriate judgmental adjustments of non modeled variables.

#### 4.2 A Baseline Forecast Path

We begin by establishing a baseline simulation path for the Japanese economy for the period through 2005. This forecast path is determined by solving the model forward given recent history and reasonable assumptions about various exogenous influences, including demographic change and the external trade environment. The medium-term horizon reported here permits discussion of medium-run macroeconomic adjustments and allows us to anticipate fundamental changes that may not be fully felt for some time.

Macroeconomic policy assumptions have an important impact on the baseline. In fact, we found that in the absence of significant ongoing macro stimulus the forecast path for the economy would be very anemic. This is not surprising considering the economy's extraordinary recent weakness. However, we do not consider this a realistic scenario. As the string of 1990s fiscal packages makes clear, the government is likely to provide additional fiscal and perhaps monetary expansion as needed to buoy the economy. Following the spirit of recent proposals, we assume a package of personal tax cuts and government investment spending beginning in 1999. These policies amount to a net fiscal stimulus of 6 trillion Yen in 1999 and about 10 trillion yen each year thereafter, or roughly 2% of Gross National Expenditure (GNE) per year. They are sufficient to restore 2.1% growth in 2000, and to pull the unemployment rate down to the 3.8% range by 2001. This is still weak performance by historical standards; the unemployment rate remains above 3% until the final year of the

forecast horizon. The government deficit increases by a cumulative 12% of GNE over the period.

A summary of the baseline forecast is given in Table 3. The forecast path for the current account shows continued widening of the surplus, both in dollar terms and as a share of GNE. This stems from relatively weak import demand compared with the assumed growth in real exports. Notice that this import weakness occurs despite an assumed gradual appreciation of the yen against the dollar during the period. This then sets the stage for a consideration of alternative scenarios that may involve adjustment to a smaller current account surplus.

#### 4.3 Current Account Adjustment Scenarios

We consider in turn scenarios to explore macroeconomic and current account implications of three potential developments discussed above: an increasing reliance on imported manufactures, particularly from Asia, the aging of Japan's population, and the effects of increased financial liberalization. In each case, an attempt is made to create a realistic scenario that can provide meaningful qualitative information about how adjustment might proceed, both at the macro level and at the level of individual sectors. By their nature such scenarios are speculative and involve somewhat arbitrary assumptions, and so should not be taken as giving specific forecasts of the actual Japanese adjustment path. In each case, the scenario takes the baseline forecast as a starting point and then assumes one or more changes in important driving influences. The model is re-solved and the results can be compared to the baseline path.

##### *Increased imports of manufactured goods and materials*

To capture aspects of the expected increase in Japanese reliance on Asian countries for manufactured goods production, we simulate an increase in Japanese manufacturing imports. Compared to the baseline forecast, we assume a higher rate of growth of Japanese imports of high-tech equipment, and to a lesser extent also industrial materials and mass-

produced “low-tech” manufactures. These changes move Japanese import patterns closer to those prevailing in the U.S. and Europe, as described in section 3.2, above. In fact, the more rapid import growth in these sectors is sufficient to raise Japan’s high-tech import share by five percentage points and other manufactures by two to three percentage points. Overall, the import adjustment amounts to about 7% of aggregate imports by the end of the forecast period. Net increases for individual industries vary because of endogenous response to changing income and price conditions.

As shown in Table 4, the rise in imports reduces the current account-to-GNE ratio to 2.5%, compared with its rise to 3.5% in the baseline. The dollar current account falls below \$140 billion, a reduction of more than \$60 billion from the original baseline. To the extent that increased imports compete with domestic production, economic activity in Japan will suffer, at least during the short run. We see this in the simulation as a reduction of the GNE growth rate by 0.5% to 0.7% per year. Consumer prices rise a bit less rapidly as a result.

The potential adjustment challenge from increased reliance on imports can also be seen in the industry-level effects of Table 5. Here we show changes in real gross output for the same broad groups of industries identified in section 3.2. The figures given are differences in output levels compared with baseline forecast levels. Notice that output declines relative to the initial baseline in all sectors of the economy, because of the recessionary impact of increased imports. But output contraction is centered in the manufactured goods sectors themselves, particularly in mass-produced goods, where significant percentage increases are assumed on a large initial import base. Non-manufactured goods sectors and services fall relatively less. This implies substantial negative employment effects in manufacturing, and therefore the potential for severe labor market dislocation in regions that are heavily dependent on manufacturing industries.

## *Population Decline and Aging*

In this simulation we evaluate the likely effects of changing Japanese demographics. The demographic issue becomes important over a longer time horizon than we are working with here. Nevertheless, we can gain insight into how these changes will influence the economy by simulating a decline in the population and a corresponding reduction in the savings rate. Population is assumed to decline at an annual rate of 0.2% to 0.3% per year over the forecast horizon. Consistent with an aging population, the ratio of savings to GNE falls by about 3 percentage points<sup>15</sup>

The macroeconomic effect of these demographic changes is summarized in Table 6. The shift from savings to increased consumption provides a substantial demand-side stimulus to the economy. The extraordinarily high rate of saving that lies behind the sluggishness of the Japanese economy and its foreign surplus is reduced as older people draw on assets to meet consumption needs. Real gross national expenditure grows roughly one percent faster than in the baseline forecast, and the unemployment rate falls to 2.1% by the end of the simulation period. Growth is actually held back by supply-side constraints, lower labor force growth and increasingly severe labor market tightness. The combination of rising labor demand and falling population drives wages up by a cumulative 20% after 7 years (not shown). Consumer prices accelerate as well. Higher product prices in turn reduce Japanese international competitiveness that, along with stronger domestic demand, stimulates imports and restrains exports. The current account falls by 1.4% of GNE over the simulation period, or \$60 billion compared with the baseline.

Clearly rapid population aging has the potential to substantially alter Japan's savings-investment balance and therefore its current account. The implied industrial restructuring that accompanies this current account turnaround would be greater than this simulation suggests, once one allows for the changing expenditure patterns that will result as an aging population shifts increasingly toward services and away from durable goods.

## *Financial Liberalization*

As we indicated above, it is difficult to anticipate the effects of Japanese financial market liberalization on the direction of financial flows and adjustments in exchange rates and other macroeconomic variables. Some aspects of ongoing and planned liberalization may facilitate capital outflows; others may permit domestic financial institutions to provide saving vehicles that are more competitive with those in the West, keeping more of Japan's saved resources at home. In the medium run, the former is perhaps the more likely scenario. Here we simulate the effect of capital outflows that might follow a complete liberalization of Japanese outward financial flows. The outflows are assumed to drive Japanese interest rates up to levels prevailing in the U.S., an increase in the bank lending rate of 250 basis points.

The yen can be expected to depreciate in response to increased capital outflows. We assume that the long-run exchange value of the yen falls by five percent against the dollar. Because the closing of the interest rate gap takes several years, the yen overshoots moderately in the short run.

The impact effect of these changes on aggregate economic activity is approximately neutral. Investment begins to decline, but the yen's depreciation significantly stimulates export sales. The current account surplus increases in the short term. Once the interest rate increase is fully in effect, the investment contraction becomes very severe; business fixed investment falls 20% below baseline levels after four years, reducing the level of real gross national expenditure 6% below the baseline.

The export boom is eventually crowded out as higher interest rates raise prices throughout the Japanese economy and eliminate the competitive gains from depreciation. Falling income reduces import demand nearly 3% over the course of the forecast, offsetting partly the yen's valuation effects that tend to raise the dollar cost of given import volumes. Overall, the simulation illustrates well the potential complexity of current account forecasting, with the trade balance moving first up, then down, and finishing not substantially different from its baseline level of \$200 billion dollars in 2005.



## 5. Conclusions

In this paper, we have examined the sources of Japan's continuing trade surpluses and the forces that will act on the surplus in coming years. Aspects of Japan's recent history may explain the country's tendency toward trade surplus. These include a population concentrated in the middle age years, Japan's high rate of economic growth, cycles of government tax and expenditure policies, and institutional factors that favor exports over imports and capital outflows. Currently, Japan's surplus is augmented somewhat by the economy's unprecedented weakness. Slow growth and a yen appreciation cycle this decade can account for perhaps a third of Japan's current surplus.

Looking to the next century, anticipated change in these forces can be expected to reduce Japan's trade surplus. An aging economy will generate less need for savings and, consequently, relatively more consumption, probably for a mix of products with more services and fewer manufactures. The consensus in the literature favors a reduction in Japanese net savings, although the bulk of these effects may not be felt for many years. Changes in Japan's relationship with Asian economies and the substantial changes in domestic financial markets will also affect aggregate trade and capital flows, as well as the composition of such flows.

The current account surplus has represented a source of aggregate demand for Japanese produced goods. A reduction of the surplus would negatively impact demand and output in the medium term. At the same time, Japanese consumers are expected to buy more and save less as they age into the retirement years, perhaps offsetting part of any aggregate demand shortfall. It will be important for Japan to maintain an appropriate macro policy stance to sustain full employment during the period of adjustment to a lower current account balance.

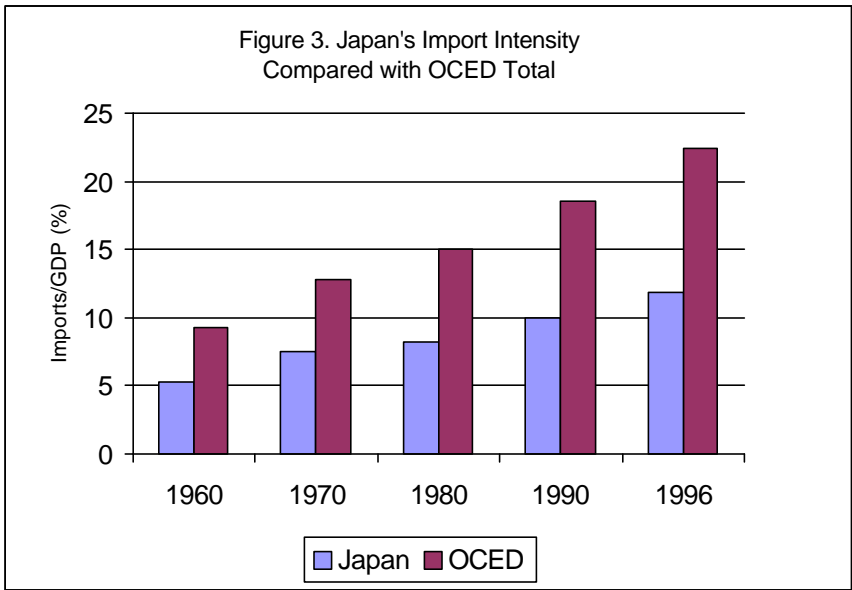
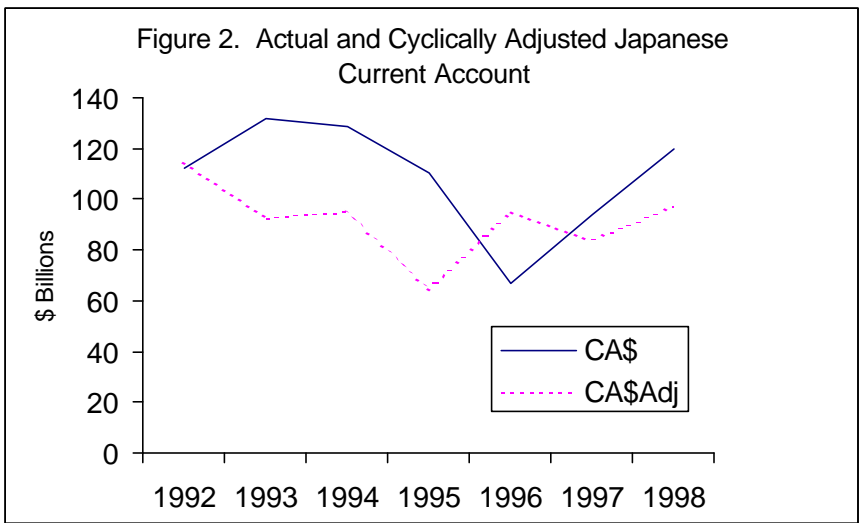
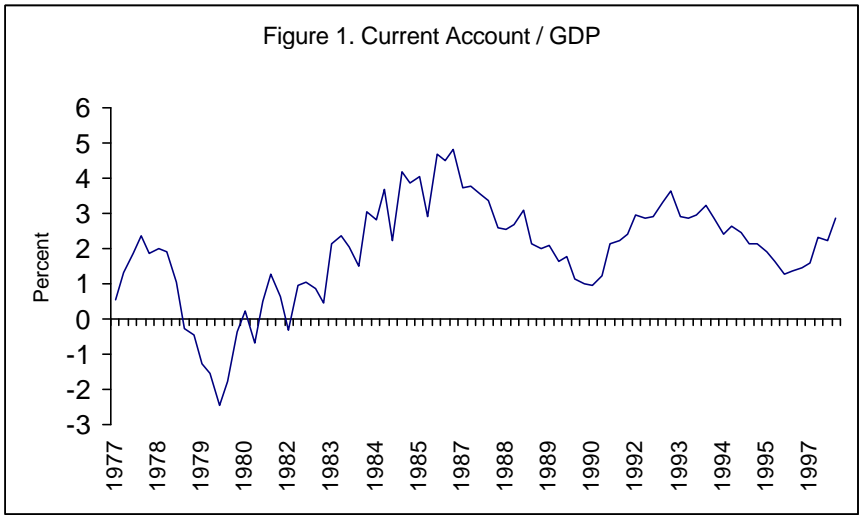
While fiscal and monetary policy can offset adverse macroeconomic effects of current account adjustment, these aggregate economic impacts represent only a part of the story. Adjustment to a smaller (or even negative) trade balance has potentially profound implications for the structure of Japanese industry and employment. Shifts at the sectoral level—between domestic tradable and nontradable goods, between manufactured goods and services—are likely to be an economically costly and socially painful feature of the anticipated readjustment of the Japanese economy.

Just as Japan's emerging surpluses were observed with keen interest (and not a little fear) by other countries during the 1980s, their eventual reduction will be of great potential importance to the global economy. A reduction in the large surplus could bring welcome relief from protectionist political pressure in the U.S. and Europe. However, similar voices of protest may emerge in Japan as the social consequences of industrial restructuring become apparent.

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**Table 1. Breakdown of Trade by Resource Intensity**

Category	SITC	Resource Intensity
1, Raw Food	00-99	Land
2. Processed Ag. Products	11-29, 41-43	Land, Labor
3. Fuels	32-35	Natural Resources
4. Industrial Materials	51-59, 67-69	Nat. Resou., Capital, Labor
5, Mass Prod. Manufactures	61-66, 81-85	Labor, Capital
6.High Tech Goods	91-97, 81-89, 71-79	Capital, Human Capital

Source: Adams and Shachmurove (1997).

**Table 2. Sectoral Breakdown of Trade**  
(percent of total trade flow)

Trade Category	1	2	3	4	5	6	1	2	3	4	5	6
Imports												
1980						1992						
To Japan	9.9	18.2	50.1	8.4	4.4	9.0	14.4	13.6	23.0	12.9	12.7	23.3
To U.S.	6.8	6.0	32.9	11.5	10.6	32.3	4.5	4.5	10.4	10.4	16.0	54.2
To Europe	9.0	5.1	8.1	22.5	15.4	39.8	8.9	4.5	3.1	20.2	15.6	47.6
Exports												
1980						1992						
From Japan	1.1	1.3	0.4	21.6	8.3	67.4	0.5	0.8	0.5	11.9	5.6	80.7
From U.S.	6.8	6.0	32.9	11.5	10.6	32.3	4.5	4.0	10.5	10.5	16.1	54.4
From Europe	8.9	5.1	8.1	22.4	15.8	39.7	8.1	4.1	2.8	27.1	14.3	43.5

Source: Adams and Shachmurove (1997).

**Table 3. Baseline Forecast with Fiscal Stimulus**

	1998	1999	2000	2001	2002	2003	2004	2005
Real GNE (Growth Rate, %)	-2.7	-0.2	2.1	2.5	2.5	2.9	3.1	2.8
Consumer Prices (Gr. Rate)	0.6	0.2	0.9	1.6	1.1	1.0	1.5	2.2
Population (Gr. Rate)	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.1
Employment (Gr. Rate)	-0.8	-0.4	0.4	0.7	0.7	0.8	1.0	1.1
Unemployment Rate (%)	4.1	4.6	4.3	3.8	3.9	3.7	3.3	3.0
Real Exports (Gr. Rate)	-2.3	2.0	3.9	3.9	4.0	3.8	3.8	4.0
Real Imports (Gr. Rate)	-8.0	1.4	2.0	2.4	2.7	3.6	4.6	5.1
CA/GNE Ratio (%)	3.0	3.2	3.2	3.4	3.4	3.4	3.5	3.5
Current Account (\$ Bil.)	119.2	134.6	143.3	155.8	165.3	176	190.6	200
Yen/Dollar Exch. Rate	130.1	120.0	118.2	116.4	114.7	113.0	111.3	109.6

Note: 1998 figures are approximately historical data; 1999-2005 are forecasts.

**Table 4. Increased Imports of Manufactured Goods**

	2000	2001	2002	2003	2004	2005
Real GNE (Growth Rate, %)	1.6	1.9	1.8	2.2	2.4	2.0
<i>Cumulative Diff. fr. Baseline</i>	-0.5	-1.1	-1.8	-2.4	-3.0	-3.8
Consumer Prices (Gr. Rate)	0.9	1.6	0.9	0.8	1.2	1.7
Real Exports (Gr. Rate)	3.9	3.9	4.0	4.0	3.9	4.2
Real Imports (Gr. Rate)	3.1	3.4	3.8	4.7	5.7	6.4
CA/GNE Ratio (%)	3.1	3.0	2.9	2.8	2.7	2.5
<i>Diff. From Baseline</i>	-0.2	-0.3	-0.5	-0.6	-0.8	-1.0
Current Account (\$ Bil.)	135.7	139.7	139.9	140.2	142.9	136.2
<i>Diff. From Baseline</i>	-7.6	-16.2	-25.3	-35.8	-47.7	-63.7

**Table 5. Increased Imports of Manufactured Goods:  
Resulting changes in real gross industry output (% difference from baseline)**

	2000	2001	2002	2003	2004	2005
Raw Food and Agric., Prod	-0.2	-0.5	-0.8	-1.1	-1.5	-2.0
Processed Foods and Ag. Prod	-0.1	-0.3	-0.4	-0.6	-0.8	-1.0
Fuels and Prods	-0.1	-0.4	-0.8	-1.3	-1.8	-2.5
Industrial Materials	-0.4	-1.2	-1.9	-2.5	-3.1	-3.8
Mass Produced Manufactures	-1.2	-2.6	-4.0	-5.3	-6.6	-8.2
High Tech Goods	-0.8	-1.9	-2.8	-3.7	-4.5	-5.5
Services	-0.4	-1.0	-1.6	-2.1	-2.7	-3.4

**Table 6. Japanese Population Decline and Aging**

	1999	2000	2001	2002	2003	2004	2005
Real GNE (Growth Rate, %)	-0.3	3.2	3.8	3.6	3.9	4.2	2.8
<i>Cumulative Diff. fr. Baseline</i>	0.0	1.1	2.3	3.4	4.4	5.5	5.5
Consumer Prices (Gr. Rate)	0.4	1.4	3.0	2.6	2.2	2.8	4.1
Population (Gr. Rate)	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.3
Employment (Gr. Rate)	-0.4	0.4	0.8	0.8	1.0	1.1	1.1
Unemployment Rate (%)	4.2	3.5	2.7	2.8	2.9	2.5	2.1
Real Exports (Gr. Rate)	1.9	3.7	3.4	3.3	3.3	3.3	3.4
Real Imports (Gr. Rate)	1.5	3.1	4.0	4.1	4.8	6.2	5.9
CA/GNE Ratio (%)	3.1	3.0	2.9	2.7	2.5	2.3	2.1
<i>Diff. From Baseline</i>	0.0	-0.2	-0.5	-0.7	-1.0	-1.2	-1.4
Current Account (\$ Bil)	134.4	137.2	141.2	140.7	140.5	141.9	140.5
<i>Diff. From Baseline</i>	-0.2	-6.1	-14.6	-24.6	-35.6	-48.7	-59.4
<i>HH Savings Rate (Diff from Baseline, %)</i>	0.0	-0.2	-0.5	-1.1	-1.9	-2.6	-3.0

**Table 7. Japanese Capital Outflows**

	2000	2001	2002	2003	2004	2005
Real GNE (Growth Rate,%)	1.5	2.8	-0.7	1.3	2.1	2.4
<i>Cumulative Diff. fr. Baseline</i>	-0.6	-0.3	-3.4	-4.9	-5.8	-6.1
Bank Lending Rate (%)	3.1	4.0	5.1	5.1	5.1	5.1
<i>Diff. from Baseline (ppts.)</i>	0.75	1.50	2.50	2.50	2.50	2.50
<i>Business Invest ( Diff. from Baseline, %)</i>	-3.6	-8.1	-15.0	-19.8	-21.5	-21.6
Real Exports (Gr. Rate)	6.1	7.8	-0.3	3.5	3.2	3.6
<i>Diff. fr. Baseline (%)</i>	2.2	6.0	1.7	1.4	0.8	0.4
Real Imports (Gr. Rate)	2.1	2.1	1.6	2.6	4.6	4.6
<i>Diff. fr. Baseline (%)</i>	0.1	-0.3	-1.3	-2.2	-2.3	-2.7
CA/GNE Ratio (%)	3.0	3.9	3.5	3.6	3.6	3.7
Current Account (\$ Bil.)	123.2	174.0	162.7	172.5	181.0	196.3
Yen/Dollar Exch. Rate	126.0	123.1	120.5	118.7	116.9	115.1
<i>Diff. from Baseline (%)</i>	6.6	5.7	5.0	5.0	5.0	5.0



## Endnotes

<sup>1</sup> For recent discussions see McKibbin and Sachs (1991), McKibbin (1996), and Krugman (1998).

<sup>2</sup> This is essentially a portfolio balance story *a la* Kouri (1976) and Obstfeld (1981.) We note that portfolio decisions involve stocks of assets rather than current saving, but changes in desired stocks imply flow savings adjustments. Expectations about the exchange rate are likely to reflect the relationship between current rates and long term rates, perhaps PPP rates, as well as foreign exchange reserve positions.

<sup>3</sup> Of, course the identity  $(S-I) = CF = NX$  must always hold. But it is not possible simply to assume that S and I determine CF and NX unless one assumes an economy at full employment income. S is endogenously related to income. Given international competitiveness and demands for foreign assets, a decline in I could reduce Y and S leaving NX and CF unaffected. In the real world, adjustment is, however, also likely to involve relative prices, returns on investment, and the exchange rate.

<sup>4</sup> The importance of intertemporal behavior in Japan's current account experience is demonstrated by several historical episodes. Consistent with consumption-smoothing behavior, Japan's current account swung into deficit during the Russo-Japanese war 1904-05 and also at the time of the Tokyo earthquake in 1923. During the World War I boom, a period of high world interest rates, Japan switched from net international debtor to net creditor. (See Obstfeld and Rogoff, 1996.) We are indebted to an anonymous referee for this point.

<sup>5</sup> For a summary, see Heller and Symansky(1997.) But not all studies support these conclusions; for example, see Bosworth (1993) and Adams and Prazmowski (1996.) Higgins (1998), on the basis of a pooled cross-country analysis concludes that the shift in Japanese age distribution between the 1950s and the 1980s can account for a nearly six percentage point rise in the savings rate over this period.

<sup>6</sup> We do not take into account, here, corporate savings, including allowances for capital consumption, though from a macroeconomic perspective these should also be considered. They may well be linked to the profitability and investment patterns of Japanese corporations.

<sup>7</sup> Krugman (1998) returns to the traditional idea of the liquidity trap, and offers the controversial recommendation that Japan escape the trap by generating inflationary expectations.

<sup>8</sup> There has been considerable research on aging in Japan and other developed economies. See, for example, Hurd and Yashiro (1997) and Ermisch and Ogawa (1994).

<sup>9</sup> In addition to the discussion by Mason and Ogawa (this volume) see, for example, Masson and Tryon, 1990, and Higgins and Williamson (1996.) Heller (1989) applies projections of demographic change to several published

savings models and finds a reduction in private savings of 3% to 12% of GDP by 2010. Masson and Tryon (1990) predict a 3% of GDP drop in national savings by 2010, similar to that of Wescott (1995). Higgins (1998) predicts a 6% drop in savings by 2010 and greater than 9% drop by 2025. Horioka (1993) estimates a greater than 15% reduction in the private savings rate between 1990 and 2010, with private savings rates turning negative by some measures.

<sup>10</sup> Masson and Tryon (1990) predict a 1.8% reduction in the investment-to-GDP ratio between 1995 and 2025, much smaller than a 4.3% expected drop in savings. Noguchi (1990) sees much smaller declines in investment so that the current account rises in the 2000-2010 period, before gradually declining after 2010. An Economic Planning Agency (1991) study sees relatively flat investment, but declining savings, so that current account balance turns to deficit soon after 2000. Yashiro and Oishi (1997) present scenarios with alternative assumptions regarding technological change and endogenous labor force participation, with the real current account declining to a deficit of -0.6% to -2.8% of GDP in the first decade of the twenty-first century. On the basis of an historical pooled cross-section model tying savings and investment to demographic change, Higgins (1998) predicts that investment will actually fall faster than savings, so that Japan's capital exports will increase by 2% to 3% of GDP over the next 25 years. Auerbach *et al.* (1989) predict a 2% of GDP drop in the current account by 2010 and a shift to a 1.5% negative current account by 2030.

<sup>11</sup> An important exception is China, which has not yet devalued its currency.

<sup>12</sup> Impacts on industrial structure in Japan are also discussed in Blomstrom, Konan, and Lipsey (this volume).

<sup>13</sup> See also, Ministry of Finance (1997). An excellent evaluation is Dekle (1998).

<sup>14</sup> An issue beyond the scope of the present analysis is the effect of smaller Japanese current account balance on the global savings-investment balance. Japan has been the single largest provider of net capital to the global economy in recent years, and an end to this supply may raise world interest rates and retard global investment and growth. Whether or not a global savings shortage emerges depends on changes in savings supply from other countries. On this, the evidence is not yet clearly set. See Wescott (1995) and Higgins (1998) for optimistic appraisals and Heller and Symansky (1997) for a more sober assessment.

<sup>15</sup> The assumed decline in savings propensity (and rise in consumption propensity) is consistent with previous estimates of the effects of aging on savings behavior. Masson and Tryon (1990) report that the effect of a one percent rise in the elderly dependency ratio is to reduce the private savings rate by 0.5% to 1.6% in a group of

well-known studies. The elderly dependency ratio is projected to fall by three percentage points between 2000 and 2005, so that a 3% fall in the savings rate is near the middle of the range of estimates.