

The Foreign Exchange Origins of Japan's Economic Slump and Low Interest Liquidity Trap

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Abstract

Japan's macroeconomic problem has yet to be properly diagnosed. Throughout the 1990s, policy makers could not decide on the proper macro economic measures to combat the country's severe economic slump. We propose a unified explanation, with deep historical roots, of why aggregate private demand failed to recover after Japan's stock and real estate bubbles burst in 1991 and deflationary pressure continues.

The problem is not purely "made in Japan". It arises from Japan's unbalanced mercantile relationship with the United States. Starting in the early 1970s, numerous trade disputes between the two countries created tensions that were (temporarily) resolved by the yen going ever higher against the dollar up to 1995. In the last two decades, this persistent pressure for the yen to rise was further aggravated by Japan's large current-account (saving) surpluses as the counterpart of America's large current account (saving) deficits. The legacy is the expectation that trade and financial tensions will recur so that the yen will be higher 10, 20, or 30 years from now — with Japan's (wholesale) price level forced correspondingly lower and nominal interest rates on yen assets remaining more than four percentage points less than those on dollar assets.

This fear of yen appreciation, whose timing is erratic and unpredictable, now inhibits private domestic investment by both Japanese firms and households. Our theory also explains why, in the late 1990s, nominal interest rates on short-term yen assets were compressed toward zero so as to destroy the normal profit margins of the banking system. In this liquidity trap, the Bank of Japan—whose monetary policy has been quite "expansionary" — is powerless to stimulate the flagging economy.

To spring the liquidity trap, eliminate deflationary pressure, and restore macro economic balance in Japan, the American and Japanese governments must act jointly to quash the expectation that the yen will be higher in the future than it is today.

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1. Japan's Domestic Economy in the 1990s

Before considering the strong international influences on Japan's economy, let us sketch the evolution of Japan's slump in the 1990s from a purely domestic perspective.

When Japan's bubble economy burst in 1991-92, the sharp fall in the stock market and land values made a significant economic downturn — or at least a period of sluggish growth (by Japanese standards) — inevitable. Bad loans in the banking system, associated with the collapsing value of real estate and equity collateral, proliferated and impaired bank capital. The sharp decline in household wealth caused consumer expenditures to fall. Excess capacity induced business firms to curtail investment. Such economic travail is hardly surprising when asset bubbles burst.

More surprising is that, almost a decade later, Japan's economy has yet to recover. Figure 1 shows how sluggish Japanese GDP growth has become in the 1990s. Except for 1996 when annualized growth touched five per cent (more on this below), GDP growth since 1991 has averaged less than one per cent per year — and was sharply negative in 1998 with negligible growth in 1999. Yet, among industrial countries, Japan had been the premier growth economy for the previous four decades. With the world's highest saving rates and seemingly endless capacity to adapt to, and dramatically augment, the latest industrial technologies, Japan's GDP grew at six to 12 per cent in the 1950s and 60s — and at a robust three to five per cent in the 1970s and 80s, when the rest of the industrial world was comparatively stagnant. Moreover, these basic virtues of private industry and thrift, and a highly skilled labor force with unmatched engineering capability in hi-tech manufacturing, remain intact. However, throughout the 1990s into 2000, domestic aggregate demand — both private investment and consumption — failed to recover.

The Fiscal Response

On the fiscal side, the Japanese government responded with massive public expenditure programs designed to prime the pump of aggregate demand. Consequently, Japan's fiscal deficit in 1999 exceeded 10 per cent of GNP. Table 1 shows that Japanese government gross debt rose from 58.2 per cent of GDP in 1991 and the OECD projected it to increase to more than 114 per cent of GDP in 2000¹, and 120 per cent in 2001. This upward trend is completely out of step with other G-7 countries. Even Italy has succeeded in putting its similarly large debt ratio on a downward trajectory (Table 1).

Offsetting this fiscal "expansion", the yen appreciated sharply in 1994-95 — peaking out at a highly overvalued 80 to the dollar in April 1995 — and depressed both exports and private domestic investment. (More on the causes of this appreciation below.) However, in 1996 when the yen fell and became less overvalued, output growth spurted to five per cent. Recovery seemed at hand.

In April 1997, believing that this fiscal pump priming had worked but concerned with the out-of-control debt buildup, the government of the then Prime Minister Ryutaro Hashimoto seized the opportunity to

¹ OECD *Economic Outlook*, December 1999, p. 226.

increase the general sales tax from three to five per cent — and to close other tax loopholes. This tax increase sent the still sluggish economy into a severe tailspin from mid-1997 through 1999. Figure 2 shows the remarkable falls in overall Japanese consumption — as well as in the subcategories of department store and new car sales through from April 1997 through 1999. Figure 3 shows the sharp rise in Japanese unemployment in the late 1990s. Because of his party's electoral losses from the slumping economy, the unfortunate Hashimoto had to resign in July 1998. Since then, new public spending programs, largely infrastructure investments, have been continually introduced. Japan is still under pressure from the U.S. Treasury, and from some commentators — see Posen [1998] — to engage in yet more Keynesian-style fiscal stimuli.

Because Japan is already in a serious debt trap, several more years of public sector fiscal “stimulus” is simply not sustainable. Taking a more consolidated approach to public sector gross debt by including the deteriorating position of local governments, and then presuming that fiscal deficits continue as in 1998-2000 out to 2005, David Asher and Robert Dugger (2000) produce the results shown in Table 2. Assuming a four per cent interest charge (a subject to which we will return) on existing public debt, they calculate that total public sector debt/GDP will reach over 220 per cent by 2005 — a number not yet seen in peacetime in any industrial country!

Even Table 2 does not tell the whole story. Japan has an aging population and an under funded social security system, whose liabilities were not counted as part of the gross debt figures shown in Tables 1 and 2. Nor were the huge contingent government liabilities from bad private bank loans, now estimated to be in the neighborhood of \$1 trillion², counted. Nor is the bad loan portfolio of the government itself — through its Fiscal Investment and Loan Program for housing, agriculture, economic development, and so on, counted. Thus, further fiscal “expansion”, which would add massively to the existing public debt — even though virtually all public debt is internally held within Japan because of massive private sector saving — is too risky.

With huge liquid savings balances, Japan's households are not currently liquidity constrained (more on the liquidity trap and ongoing deflation below) in contrast to what a static Keynesian public spending multiplier, which supposes that most agents are liquidity constrained, would project. Nevertheless, ordinary Japanese still worry about the disarray in the public finances for their social security — pensions, medical care, and so on — in the longer run. Thus, in the face of huge public sector deficits and unsustainable debts, current private spending has weakened further — i.e., personal saving has increased — as people decide to protect their own social security: a form of Ricardian equivalence. Thus has the string run out on further fiscal “expansionism”.

The Monetary Response

Monetary policy is also at an impasse as Japan enters the new millennium. However, a decade earlier, the Bank of Japan's (BoJ) tight money policy had been effective in bursting the asset bubble. The sharp contraction in the monetary base in 1991-92 — a contraction that had more drastic and prolonged

² *New York Times*, July 30, 1998.

deflationary consequences than the BoJ intended — is shown in Figure 4. By 1994, however, Figure 4 also shows that monetary policy became expansive: base money subsequently has grown between four and 10 per cent per year. Because this monetary growth has been much faster than the sluggish growth in nominal GDP, the velocity of base money has fallen sharply — see Figure 5. That is, this resurgence of strong monetary growth failed to re-stimulate income growth.

The old admonition, from the Great Depression of the 1930s, warning against “pushing on string” should be recalled. Monetary policy can restrain overheating but it is less effective in stimulating a weak economy, with strong deflationary momentum, into recovery. From 1994, the stimulative effect of the BoJ’s strong expansion in base money was ultimately frustrated by a breakdown in the monetary transmission mechanism. From a purely domestic perspective (the all-important impasse in the foreign exchanges is discussed later), Japan’s broken money has three closely related aspects:

- (1) *The low interest rate trap.* Starting with short-term interest rates of a little over two per cent in 1994-95, the BoJ reduced the overnight bank lending rate to just 0.5 per cent in 1996 and then announced its now-famous zero interest rate policy in April 1999 — all shown in Figure 6. With the zero interest floor, the BoJ has no further leverage over the economy in this dimension.
- (2) *The fall in bank lending.* Despite (because of?) the ultra low interest rates, commercial bank lending was stagnant — growing less than one per cent per year after 1994 and then falling in 1999 and subsequently. In the 1980s, by contrast, bank lending had grown much faster than the monetary aggregates (Figure 4).
- (3) *Excess reserve holding by financial institutions.* As interest rates on interbank lending fall to near-zero levels, and the demand by nonbanks for credit remains weak and unprofitable, the opportunity cost of commercial banks — and tanshi brokers (who are also authorized to hold deposits with BoJ) to hold excess reserves with the BoJ (Figure 7) — also falls to zero.

The upshot is the infamous liquidity trap for monetary policy. Not only can short-term interest rates not be cut further to stimulate the private sector, but the demand for (velocity of) base money itself has become indeterminate. The traditional multiplier link from the creation of base money to bank credit creation has been broken. (Problems with the market for long-term bonds when interest rates become low are considered below.)

When monetary policy is caught in a liquidity trap, increased public expenditures is the textbook solution for overcoming a slump because government expenditure can increase without bidding up interest rates. But, given the parlous state of Japan’s public finances and worries of the populace about their future social security as described above, the fiscal route is not sustainable. From this purely *domestic* perspective, no wonder Japanese leaders are discouraged:

Japan’s economy is still fragile but the Japanese government has run out of policy options, a leading official in the ruling coalition has admitted. “It is very difficult to know what to do to achieve clear economic recovery” said Chikara Sakaguchi, policy chief of the New Komeito party, a member of the ruling coalition. (*Financial Times*, May 5, 2000. Page 4.)

2. The Syndrome of the Ever Higher Yen

Before deciding on policies to sustain economic recovery in Japan, one must first properly diagnose what has gone wrong. Here, a more *international* perspective is called for. Among industrial countries, Japan is unique in having relative deflation — and the expectations of continued deflation — arising out of its peculiar political-economic relationship with the United States over the past three decades.

In textbooks on international finance, national monetary policies are usually presumed to be independently determined, and then exchange rates adjust to these policies. For most industrial countries with floating exchange rates, this prevailing textbook view is surely right. In Euroland for example, if the European Central Bank (ECB) announced a massive easing of monetary policy — a big expansion of commercial bank reserves with the intention of driving short-term interest rates towards zero — then the euro would fall precipitously in the foreign exchange markets. Similarly, if the Bank of England announced a major monetary expansion beyond any measure consistent with its internal inflation target, the pound sterling would fall like a rock.

But Japan is different. In April 1999, the Bank of Japan (BoJ) announced its now famous zero interest rate policy with a monetary expansion that has left commercial banks swimming in excess reserves (see above). Yet, even as the economy has remained depressed, the yen has remained very strong in the foreign exchanges. From April 1999 through April 2000, the yen rose from about 120 to 107 to the dollar despite massive intervention by the government to sell yen and buy dollars: Japan's official exchange reserves increased by over \$80 billion as the government desperately struggled to keep the yen from rising.

The yen/dollar rate remains unpredictably volatile in the short and medium terms — and the yen has depreciated substantially from its peak in 1995. Nevertheless, the continual pressure in the foreign markets for the yen to rise is of very long standing. This expectation generates a fear of deflation that damps down current spending by Japanese households and businesses, while driving nominal interest rates toward zero. How these perverse exchange rate expectations came about is deeply rooted in the history of mercantile interaction between Japan and the United States — what we called the “syndrome of the ever higher yen” [McKinnon and Ohno, 1997].

As defined by *Webster's Tenth New Collegiate Dictionary*, a *syndrome* is “a group of signs and symptoms that occur together and characterize a particular abnormality; and a set of concurrent things (as emotions or actions) that usually form an identifiable pattern”. But people ensnared in a syndrome, say, policy makers in Japan and the United States, need not realize what has happened to them — nor understand the economic consequences.

Under the old Bretton Woods parity system for exchange rates from 1949 to 1971, Japan's exchange rate was fixed at 360 yen/dollar. In this era of Japan's highest economic growth unmatched before or since, the parity regime was highly credible with no evidence of expected yen appreciation, despite Japan's substantial encroachment on American markets. Indeed, starting with the Dodge Line Program

in 1949 to stabilize the highly inflationary Japanese economy of 1946-48, keeping the rate at 360 was widely seen as the necessary anchor for Japan's monetary policy for more than 20 years.

Mercantile Pressure from the United States

Then the exchange rate regime changed. Worried about America's declining international competitiveness, President Nixon abrogated the dollar's last links to gold in August 1971 and he also imposed a surcharge on all imports of manufactured goods into the United States. He insisted that this surcharge would remain in place until trading partners in Europe and Japan appreciated the dollar value of their currencies. Similar to other industrial countries, Japan let the yen appreciate by 17 per cent by the end of 1971 — and the surcharge was removed.

After 1971, American mercantile concerns became more and more narrowly focussed on the rapidly growing Japanese economy with its large trade surpluses. While Japan displaced the United States as the dominant supplier in many manufacturing industries worldwide, Japan's home markets remained relatively closed to foreign competition. This American grievance that Japan was an unfair international competitor was compounded by the emergence of Japan's trade surpluses in the mid-1970s. The result was innumerable trade disputes between the two countries.

Then, the yen appreciated enormously — if episodically — from 360 until it briefly touched 80 to the dollar in April 1995. Figure 8 shows the four main episodes — 1971-73, 1977-78, 1985-87, and 1993-95 of upward ratchets in the yen. Our book hypothesized that the interactions of the American and Japanese governments in their conduct of commercial, exchange rate, and monetary policies resulted in the ongoing expectation that the yen would “normally” appreciate — if only erratically — in the longer run. What mechanism propagated this syndrome and continues the expectation that the yen will rise?

No matter how much the dollar fell, at least some U.S. officials typically looked at the Japanese trade surplus and saw further room for yen appreciation. Since the Nixon shock in 1971, various secretaries of the Treasury — notably Blumenthal in 1977, Baker in 1985-87, and Bentsen in 1993 have suggested that the dollar was too high against the yen. Often these attempts to “talk” the dollar down were accompanied by intense negotiations aimed at forcing the Japanese to open or share this or that market, or to impose “voluntary” restraints on Japanese exports. Trade disputes were particularly intense during the four episodes when the yen ratcheted upward. For example, in the first four months of 1995, when the U.S. Trade Representative tried to negotiate numerical targets for Japan to buy American automobiles and components by threatening to impose high tariffs on American imports of Japanese autos, the dollar fell particularly sharply, from 95 to 80 yen (Figure 8).

In addition to “talk” by secretaries of the Treasury, why should trade disputes themselves cause the yen to appreciate? In the middle of a dispute, foreign exchange traders see a higher yen ameliorating — or perhaps forestalling — protectionist threats from the United States. And, in the short run, a rising yen does indeed improve American competitiveness vis-à-vis Japan — although it washes out in the long run when purchasing power parity is restored as the Japanese wholesale price level falls relative to the American. Figure 9 shows the Japanese wholesale price level rising more slowly than the American after

the mid-1970s — and then falling absolutely after 1985.³ Consequently, purchasing power parity for the yen/dollar rate drifted steadily downward from the mid-1970s through the late 1990s, as shown in Figure 10.

These mercantile concerns of the American government and industrial lobbies have been aided and abetted by economists, perhaps the majority of them, who espouse an exchange rate doctrine based on the elasticities model of the balance of trade. Into the 1990s, they tried to convince American policy makers that devaluing the dollar would, in itself, reduce the U.S. trade or current account deficit, and that exchange-rate changes could be treated as a rather “clean” and acceptable instrument of economic policy⁴. Japan has had the biggest current-account surpluses, about the same size as the U.S. current-account deficits in the late 1980s.

True, American mercantile pressure on Japan has been in remission since April 1995 when the yen peaked at 80 to the dollar — a level so overvalued by the PPP criterion (Figure 10) that American officials worried then about a collapse in the Japanese economy. So the “normal” American mercantile pressure ceased, and the American government signaled — by joint interventions with the Japanese government to drive the yen down in the summer of 1995 — that it would accept a much lower value of the yen (McKinnon and Ohno 1997, Ch. 11). Indeed, the then Treasury Secretary, Robert Rubin, unlike his predecessors, subsequently reaffirmed several times that he was in favor of a strong dollar. So has his successor, Lawrence Summers.

However, American mercantile pressure for yen appreciation could return. Figure 11 scales each country’s current account against its own GDP. It shows the remarkable persistence in Japan’s current account surpluses since the early 1980s, and in American current account deficits since the mid-1970s. Because of huge U.S. government deficits in the 1980s, the American current account deficit peaked out at about three per cent of GNP in 1986-87 (Japan’s surplus at that time was about four per cent of its GDP) and American mercantile pressure—sometimes called “Japan bashing” was very intense. And, in the late 1990s, American private saving declined (perhaps because of the boom in stock market asset values) so that the U.S. current account deficit surged to an unprecedented four per cent of GDP by 2000.

In the new millenium, Japan is not proportionally as big a creditor to the U.S. as it was in the mid-1980s — although it is still the largest. And, since the mid-1990s, America’s extraordinary “Goldilocks” economy of high growth coupled with (over) full employment has undoubtedly muted much protectionist concern with job losses coming from surging imports. Nevertheless, not much disruption in the American economic machine need occur before industrial lobbies come out in full force to complain about unfair foreign competition and undervalued foreign currencies.

3 Because of a strong Balassa-Samuelson effect since the early 1950s, Japan’s CPI has risen strongly relative to its WPI. Nevertheless, in computing PPP exchange rates that balance international competitiveness at the “factory gate”, we believe that comparing WPIs (the producer price index in the United States) between the two countries is appropriate.

4 When applied to financially open industrial economies that would otherwise be stable, this elasticities approach for correcting a trade imbalance is misplaced (Komiya 1994, McKinnon and Ohno, 1997, Ch. 6). Instead, the persistent current account imbalance between the two countries reflects Japan’s saving surplus on the one hand, and abnormally low U.S. saving on the other.

Cumulative Currency Risk in Japanese Financial Institutions

Even though American mercantile pressure to get the yen up has not been officially active since 1995, currency risk still contributes to today's upward pressure on the yen. For more than 30 years, Japan has run current-account (trade) surpluses (Figure 11). Correspondingly, Japanese financial institutions have accumulated financial claims on the rest of the world. But the world is still on a dollar standard in the sense that most international capital flows (outside of Europe) are dollar denominated. So most of these claims on foreigners are interest bearing dollar assets.

However, as Japan's current account surpluses continue, the proportion of dollar assets in the portfolios of Japanese banks and insurance companies increases. (Figure 12 shows some very preliminary estimates for banks and insurance companies of the order of 12 to 16 per cent.) As time passes, Japanese financial institutions see heightened currency risk in acquiring yet more dollar assets — which could suddenly lose value if the yen appreciates. This reluctance to keep acquiring dollar assets then uncovers Japan's current-account surplus as its matching private capital outflow diminishes. Thus the yen tends to jump, and we have a vicious circle.

When upward pressure on the yen is strong, the Japanese government absorbs some of the currency risk by acquiring dollar reserves (largely U.S. Treasuries) with the proceeds from selling yen denominated “finance bills”. The government, more narrowly the Ministry of Finance (MoF), thus becomes a substitute international financial intermediary for financing Japan's current-account surplus — sometimes on a large scale. For example, from April 1999 to April 2000, the official accumulation of \$80 billion of exchange reserves was almost three-quarters of the corresponding current account surplus.

With this official intervention, the private sector is thereby relieved of the risk of adding to its own dollar assets. But insofar as private financial institutions begin to doubt that the government will continue such a rapid buildup of dollar reserves to keep a lid on the yen's dollar value, they become even more reluctant to acquire dollar assets — and could even try to dishoard what they have already accumulated. This reluctance puts more upward pressure on the yen, and so we have a vicious circle strengthening the expectation of an ever-higher yen and keeping Japanese nominal interest rates low (as we shall show below).

The Adjustment Mechanism for Sustaining Yen Appreciation: A Stylized Summary

To sustain the syndrome of an ever-higher yen against the dollar in the longer run, national monetary policies in the two countries must be consistent with the relative deflation in Japan shown in Figure 9. Consider the propagation mechanism in five highly stylized stages.

- (1) At the center of the world dollar standard, the U.S. Federal Reserve System (Fed) independently determines American monetary policy — the U.S. price level and interest rates — while paying little or no heed to exchange rates, economic conditions abroad, or foreign official interventions against the dollar (McKinnon, 1996).

- (2) A mercantile dispute erupts between Japan and the United States. But trade sanctions against Japan are averted by the yen appreciating in the foreign exchanges making Japanese exporters less competitive in the short run, and the BoJ hesitates to flood the market with liquidity to bring the yen back down⁵.
- (3) Once the yen has risen, the BoJ tolerates relative deflation in the medium-term in order to sustain the higher dollar value of the yen. But eventually, the relative fall in Japan's price level restores its mercantile competitiveness.
- (4) Trade disputes recur leading to episodic yen appreciations that force Japan into relative deflation in the longer run and reinforce expectations of an ever-higher yen.
- (5) In financing Japan's current-account surplus, the increasing currency risk from the buildup of dollar claims eventually dampens capital outflows, thus putting more upward pressure on the yen even when American mercantile pressure is in remission.

3. Exchange Rate Expectations and Interest Rates

Although the yen began appreciating in 1971, the expectation of an ever-higher yen (so central to the syndrome) was not yet firmly rooted in anybody's mind. The yen appreciation of 1971-73 was thought to be a one-time adjustment associated with the collapse of the Bretton Woods System of fixed dollar parities. In the early 1970s, people worried more about the inflationary pressure emanating from the United States — including Japan's severe price-wage inflation through 1974. The great volatility of exchange rates, rather than sustained movement in one direction, seemed to be the more pressing problem.

However, in June 1977, when U.S. Treasury Secretary Michael Blumenthal complained that the dollar was again overvalued against the yen (although the dollar was about right by the PPP criterion), he signaled the emergence of the syndrome in bilateral United States — Japan relations — as distinct from American mercantile problems with other trading partners. The resulting run on the "Carter" dollar was finally halted in November 1978 through massive intervention by all the important central banks coupled with a sharp increase in both short- and long-term U.S. interest rates. In contrast, Japanese long rates fell in nominal terms in 1977-79, and fell even more relative to their American counterparts. Since 1977, interest rates on 10-year JGBs averaged 4 percentage points or so less than those on 10-year U.S. Treasuries (Figure 13). Because long-term interest rates are not directly under the control of national central banks, any differential better reflects expected exchange rate changes and inflation differentials — as measured by a broad index of tradable goods prices such as the WPI (Figure 9).

⁵ In episodes of particularly sharp yen appreciations, the BoJ typically responds by cutting short-term interest rates in order to dampen the yen's upward momentum. When Japanese short rates were already close to zero, this avenue may be pretty limited. In general, when researchers fit short-run reaction functions of the BoJ for setting its discount rate, short-run exchange-rate smoothing is an important objective (Ueda, 1992, 1995), (Yoshino and Yoshimura, 1995), (Cargill, Hutchison, and Ito, 1997).

Thus the post-1977 differential in long-term market-determined interest rates between Japan and the United States is the best evidence we have that expectations of sustained yen appreciation against the dollar were now in place — as per the principle of open-interest parity. Why else would people and institutions, such as Japanese banks and insurance companies, hold JGBs in some kind of portfolio balance with U.S. treasuries — which earn over 4 percentage points more — unless the holders were (and are) implicitly projecting that the yen will be higher 10 years from now than it is today? In May 2000 the yield on 10-year U.S. treasuries was about 6.4 per cent while that on JGBs was 1.7 per cent.

These expectations of yen appreciation *in the long term* remained remarkably robust despite the ebb and flow of actual movements in the yen-dollar exchange rate in the short and intermediate terms. They were not upset by the Reagan period of the “surprisingly” strong dollar from late 1980 through early 1985. Similarly, when the yen fell from 80 per dollar in April 1995 to about 147 in June 1998, the markets were again continually “surprised” in the sense that open interest parity was again temporarily violated. American nominal interest rates at different terms to maturity remained 4 to 5 percentage points higher (Figures 13 and 14) than their Japanese counterparts. With the benefit of hindsight, investors could have made a killing if they had just sold yen assets and bought dollar interest-bearing dollar assets in either episode.

Although any substantial fall in the yen may weaken this expectation of long-term appreciation (reduce the slope coefficient for the trend line), exchange rate expectations remain fundamentally regressive with respect to that trend. So the “surprise” fall in the yen from April 1995 to June 1998 set up the expectation that the yen must appreciate towards its trend. These regressive expectations explain the paradox that the interest differential has widened by a percentage point or so in periods of yen weakness.

Finally, there is the impact of the benchmark American interest rates themselves — which we hypothesized are independently determined. Since peaking at about eight per cent in 1994, American long-term rates have fallen to closer to five per cent in 1998 into 1999, but then rose above six per cent in 2000 (Figure 13). Subject to the constraint that they cannot fall below zero, Japanese interest rates must be below American by however much the yen is expected to appreciate — apparently about four per cent per year. So the tightening of the low interest rate trap in Japan in the late 1990s into the new millennium was aggravated by lower interest rates in the United States.

From a longer term perspective, two forces operated to keep Japanese nominal (but not real) interest rates very low throughout the 1990s.

- (i) The *trend expectation* that yen appreciation will continue over the longer term.
- (ii) The *fall in U.S. interest rates* from their relatively very high levels of the 1970s and 1980s.

A Model of the Liquidity Trap with International Arbitrage

For modeling purposes, let us now formally assume that Japanese firms and households, and international financiers holding portfolios of both yen and dollar bonds, expect the yen to resume rising over the longer term. Although the actual near-term path of the dollar/yen exchange rate is uncertain, people

expect the yen to be higher 10 or 20 years from now than it is today. The average annual expected percentage rate of yen appreciation against the dollar is θ .

Further assume that the term structure of interest rates in both Japan and the United States is flat. On yen assets, say, benchmark government bonds, interest rates are the same at all terms to maturity — and similarly for dollar bonds. (The relaxation of this assumption will be discussed at a later stage.) Let i denote “the” nominal rate of interest in Japan, and i^* denote “the” nominal interest rate in the United States, at all terms to maturity. Real interest rates within each economy are:

$$r = i - \pi \text{ (Japan),} \quad r^* = i^* - \pi^* \text{ (United States)} \quad (1)$$

As long as our analysis only compares long-run steady states, i.e., balanced inflation paths, then the actual and expected inflation rate will be the same — as denoted by π and π^* . (Of course, in the transition from one steady state to another, then expected inflation could differ from that currently experienced.)

To capture the asymmetry between Japan and the United States, we assume that the Federal Reserve System conducts monetary policy independently of external influences. At the center of world dollar standard, American macroeconomic policy is the “first mover”. Let us further assume for simplicity that the real interest rate, r^* , on dollar bonds is constant. But because the Fed doesn’t always get things right, American inflation and inflationary expectations, π^* can still vary. Thus, for a given real interest rate, the U.S. nominal interest rate varies according to the forward-looking domestic Fisher condition:

$$i^* = r^* + \pi^* \quad (2)$$

(2) indicates that the nominal interest rate in the United States varies with expected inflation in the American economy independently of the course of the yen/dollar exchange rate. In contrast, Japanese interest rates — both nominal and real — are determined internationally, where expected movements in the yen/dollar rate are important.

Suppose we impose the further simplifying assumption of *relative purchasing power parity*. The anticipated fall in the Japanese price level (WPI) relative to the American matches the expected appreciation of the yen. Then

$$\pi = \pi^* - \theta \quad (3)$$

Because our formal model only compares steady state inflation paths, this assumption of relative purchasing power parity is virtually inescapable. Over this “long” time horizon, changes in the real exchange rate are ruled out. The upward drift in the *nominal* dollar value of the yen leads to an offsetting relative fall in the Japanese wholesale price level relative to the American (Figure 9) so that purchasing power parity tends to be restored (Figure 10). Of course, jumps in the exchange rate can lead to serious overvaluation or undervaluation of the yen in the short and medium terms, but this is not captured by our algebra, which focuses on the deflationary consequences of longer term expectations of nominal yen appreciation.

How then can we relate the real interest rate in Japan to that in the United States?

Model 1

Suppose first that nominal interest rates in Japan are not in a liquidity trap, i.e., they are greater than zero. Suppose further that there is no risk premium in interest rates. Then, from the principle of *open interest parity*, we have

$$i = i^* - \theta \quad \text{when } i > 0 \quad (4)$$

The Japanese nominal interest rate is determined by the expected appreciation of the yen against the dollar and by the American nominal interest rate. By substituting (4) and (3) into (1), Japan's real interest rate is equal to the exogenously given American real rate:

$$r = r^* \quad (5)$$

Because real rates are naturally “forward-looking” to future inflation, precise measures of the “real” interest rate in both countries are not available for testing equation (5) empirically. One would need internationally comparable survey data on the expected rate of inflation, precisely focussed on the WPI in each country, at fairly long terms to maturity. These expected inflation rates could be used to deflate nominal interest rates to get real rates as per equation (1) above. But such data do not exist for the WPI, or for any other price indexes.

Instead, if one uses a crude “backward-looking” approximation, real interest rates in the two countries seem to have stayed fairly close together throughout most of the postwar period. From 1966 to 1999, Figure 15 crudely measures real interest rates by subtracting WPI inflation, calculated as a five-year backward looking moving average, in each country from its nominal interest rate on 10-year bonds. In this backward-looking deflation procedure, much of the variance in the “real” interest rates plotted in Figure 15 comes from unexpected bursts of inflation or deflation. But these bursts seem to be experienced jointly by the two countries — so the estimated real rates stay quite close to one another. The “true” forward-looking real interest rates are probably much less volatile than what is shown in Figure 15.

Model 2

But now suppose that Japanese nominal interest rates have been forced toward zero — because either θ has risen or i^* has fallen. Then, in this liquidity trap, open interest parity could be violated:

$$i \geq i^* - \theta \quad \text{when } i = 0 \quad (6)$$

Because the Japanese nominal interest rate has been trapped at zero, the interest differential, $i - i^*$, is now too small (in absolute terms) to reflect expected yen appreciation.

In the liquidity trap, by substituting (6) and (3) into (1), we see that Japan's real interest rate is *greater than* its American counterpart:

$$r \geq r^* \quad (7)$$

or equivalently,

$$r \geq i - \pi \quad (7')$$

In the liquidity trap, Japan's real interest rate is greater than its nominal rate minus expected inflation. That is, with a zero nominal interest rate, Japan's real rate is greater than expected deflation. But the key difference between our model and others in the zero-bound literature is that we hypothesize that the source of the deflationary pressure in Japan is externally imposed through the expectation of an ever-higher yen — rather than being primarily a question of internal aggregate supply and demand⁶. But the two, as we shall see, interact.

For both nominal and real interest rates, these international arbitrage conditions in the financial and goods markets constrain the Japanese macro economy. To stimulate private investment and consumption, the Japanese authorities cannot realistically expect to drive the Japanese real interest rate, more accurately the cost of capital, down to very low or negative levels⁷. In the steady state, real interest rates in Japan must remain “close” to those prevailing in the center country — although springing the liquidity trap could reduce the real cost of capital down to American levels.

But Model 2, as specified so far, is incomplete. There must also be an arbitrage condition that balances international bond portfolios. Equations (6) and (7) show the Japanese nominal and real interest rates seen by domestic households and firms in deciding how much interest bearing yen assets to hold relative to interest bearing dollar assets. But, in the liquidity trap, (6) shows that open interest parity is violated. Japan's zero nominal interest rate is greater than the American nominal interest rate, less expected yen appreciation.

With no risk premium in Japanese interest rates, there would be massive capital inflows *into* Japan as the economy sank into the liquidity trap⁸. The yen could jump upward in the foreign exchanges well beyond the “normal” expected annual appreciation of θ . Indeed, episodic upward ratchets in the yen are not uncommon. For example, on October 6, 1998, the yen ratcheted up from 135 to 115 to the dollar in the space of a few hours.

6 Thanks to Hiroshi Fujuki for clarifying this point.

7 As in Krugman's (1998) “closed economy” model of the liquidity trap. Ongoing steady state inflation, as Krugman wanted the Japanese authorities to announce, would not itself do the trick. Going further to impose interest rate ceilings on yen assets in the face of inflation could lead to unsustainable capital flight — and (outside our model), unacceptable real devaluation of the yen.

8 We are highly indebted to Akiyoshi Horiuchi, University of Tokyo, for pointing out this logical gap in an earlier version of this paper.

International portfolio balance can be maintained, albeit uneasily, if one assumes that holding Japanese bonds becomes very risky as their nominal interest rates approach zero. Indeed for very long term bonds like perpetuities that pay an annual coupon rate fixed in yen, their market price is simply

$$\text{Bond Price} = \text{BP} = \text{Coupon rate} / i \quad (8)$$

where BP and $\text{Var}(\text{BP}) \rightarrow \infty$

as $i \rightarrow 0$ from above.

In fact, the variance in the market price of a perpetuity becomes infinite as market interest rates approach zero. Although not as extreme for shorter-term securities, the market prices of all bonds become more volatile as the nominal interest rate falls. Suppose ρ is the risk premium for holding yen bonds instead of dollar bonds. As portrayed in Figure 16, let us capture this greater risk of holding yen-denominated bonds in a low interest environment by positing that:

$$\rho = F(i) \text{ where } dF/di \rightarrow 4 \text{ as } i \rightarrow 0. \quad (9)$$

As nominal interest rates on yen assets approach zero, (9) assures us that the domestic risk premium ρ (on Japanese bonds) always adjusts upwards enough to maintain international portfolio balance between holding yen and dollar bonds. That is, $\rho \rightarrow i - i^* + \theta$ when $i \rightarrow 0$. This smooth endogenous adjustment in ρ for sustaining portfolio balance is shown in Figure 16.

However, to simplify our macro economic modeling, as shown in Figures 17 and 19, we adopt the corner solutions for ρ shown in (10) below

$$\begin{aligned} \rho &= i - i^* + \theta & \text{when } i = 0; \text{ and} \\ \rho &= 0 & \text{when } i > 0 \end{aligned} \quad (10)$$

So with the corner solution where $i = 0$ in the liquidity trap, the risk-adjusted nominal return on Japanese bonds is simply $-\rho$. For the other corner solution outside the liquidity trap where $i > 0$, the risk premium vanishes i.e., $\rho = 0$. In the case of the liquidity trap, we can then substitute equation (3) into (10) to eliminate θ to get

$$r = r^* + \rho \quad (11)$$

The real cost of capital in Japan is forced above that in the United States by the risk premium ρ .

For Japan, Figure 17 plots the marginal efficiency of investment (risk adjusted) against the real cost of capital. Outside the liquidity trap and without any threat of sudden yen appreciation, private investment is quite buoyant at I_1 . The real cost of capital, r^* , is the same as in the United States. In the externally imposed liquidity trap, the cost of capital increases to $r^* + \rho$ which by itself would shift investment down to I_2 . But, in addition, the marginal efficiency of investment schedule shifts to the left because of fear of sudden yen appreciation. The result of this double whammy is that domestic private investment is depressed all the way down to I_3 .

Caveat. An alternative approach to modeling the private investment decision in Japan is to distinguish between investing in the tradable and nontradable goods sectors. As Rishi Goyal has pointed out to the authors, the risks seen for investment in the tradable goods sector with the threat of sudden yen appreciation would be higher than for investing in nontradables. Investment in nontradable services could even increase driving down expected returns in this sector, even as riskier investment in tradables was curtailed — leaving higher expected returns in that sector. But such disaggregation is far beyond the scope of this paper.

However one closes the “real” side of the model, the basic monetary impasse remains. Under the syndrome of the ever higher yen, rates of interest in Japan (the cost of capital) cannot be depressed enough to stimulate private spending for growth and employment.

4. The Externally Imposed Liquidity Trap: Financial Implications

Returning to the problem of Japan’s “broken money” (page 4), i.e., the impotence of monetary policy in the liquidity trap, let us examine its financial implications more closely.

The Demand for Money

Consider the demand for narrow (non-interest bearing) yen balances within Japan when interest rates are given by our international arbitrage conditions. Figure 18 shows how the demand for *real* cash balances, M/P on the horizontal axis, is inversely related to the *nominal* interest rate i on the vertical axis. This money demand function also depends on Japan’s income, wealth, and other economic characteristics. Using lowercase variables to denote logarithms (except for the interest rate) where y represents national income or output, the demand for money is

$$m - p = \alpha i + \beta y + \text{other} \quad (12)$$

But on our steady-state balanced inflation paths, the nominal interest rate on yen bonds is externally imposed (as per our “syndrome of the ever-higher yen”) in equation (12), and the domestic real money stock is assumed to adjust fully to it. Outside the liquidity trap where $i > 0$, the Bank of Japan cannot independently determine the money supply in this long run sense. Rather the BoJ accommodates ongoing deflationary pressure imposed from the outside — and allows the real money stock to adjust to the demand for it at the externally determined nominal interest rate and price level.

But a large taxonomy of externally imposed interest rates is possible — including the case of the liquidity trap. Figure 18 shows just five cases denoted by the numbers 1 through 5. The nominal interest rates on the vertical scale are determined by interest rates in the United States (shown with *) minus the expected rate of yen appreciation, θ .

Clearly, if nominal rates of interest in the U.S. are high, and the yen is *not* expected to appreciate, as at point 1 in Figure 18, then the nominal rate of interest in Japan will be quite high and, for any given income level, the demand for real balances will be quite low. But if U.S. interest rates come down and

the yen is expected to appreciate, i.e., θ is substantially greater than zero, then Japanese nominal interest rates will fall toward zero and the demand for real yen balances in Japan becomes very large.

The strong liquidity trap is shown by point 5 (or 5') in Figure 18, where θN is an expected rate of yen appreciation which exceeds the nominal interest rate in the United States. With no inflation in the United States, the *notional* nominal interest rate in Japan is $r^* - \theta N < 0$. But, of course, no market mechanism permits the actual nominal interest rate on bonds to go negative. Instead, people would hold only more liquid cash balances. Thus, the actual nominal interest rate remains trapped at zero, i.e., $i = 0$.

But now the demand for domestic money is indeterminate. If the central bank pumps out more base money in a vain attempt to revive the slumping economy, an equilibrium such as that at point 5' with a very large monetary base, say due to large excess reserves in the banking system, is possible. Paradoxically, in the liquidity trap, the central bank can now control the stock of real balances—although it can't effect anything else! Because the commercial banks hold excess reserves and the profitability of new bank lending is low (more on this below), the non-interest credit channel of Bernanke and Gertler (1989) for the central bank to influence the economy through the “special” position of commercial banks in granting credit to smaller firms is severely curtailed in the liquidity trap.

If the economy slumps further so that our money demand curve shifts to the left, the central bank could (but need not) let the stock of base money fall to that shown at point 5. But with the short-term interest rate trapped at zero, in neither case can the central bank influence real economic activity.

This helplessness of Japanese monetary policy in influencing economic activity can be illustrated with a pseudo ISLM analysis, i.e., one using real rather than the nominal rates of interest. Figure 19 plots the real rate of interest on the vertical axis and real output on the horizontal axis. (In the background to Figure 19, the falling nominal price level is predetermined by the long-run expectation of an ever-higher yen.) The IS curve responds to real interest rates: investment falls when real interest rates rise. But, because the real rate of interest is imposed from without and not influenced by the domestic money supply, the pseudo LM curve is always horizontal—whether in the liquidity trap or not. Outside the liquidity trap, the real interest rate is given by r^* and, in the absence of a threat of sudden yen appreciation, the IS curve could be well to the right at IS(a)—leading to full-employment output at Y_1 . Inside the liquidity trap, the real interest rate (cost of capital) increases to $r^* + \rho$ and the IS curve shifts well to the left, to IS(b), because of the threat of sudden (real) yen appreciation—leading to an under employment equilibrium at Y_5 .

In Japan's case, massive government expenditure programs have attempted to shift the IS curve back to the right, although the huge build-up of government debt (not in the ISLM model) limits fiscal effectiveness. But because of foreign exchange risk and the threat of ongoing deflation, private spending remains depressed.

If the economy is depressed at Y_5 , another possible way out would be for Japan to increase its trade surplus, i.e., export its way out. But starting with a large trade surplus and huge net creditor status in the world economy, this avenue is also quite constrained by:

- (1) Foreign mercantile concerns, particularly in the U.S., but now also in the EU, of being inundated with Japanese goods — the problem which created the syndrome of the ever-higher yen to begin with.
- (2) The cumulatively increasing currency risk from the build-up of dollar claims in Japanese financial institutions, making private finance for another Japanese export drive harder to come by.
- (3) Depressed private investment in the domestic tradable goods sector from the ever-present threat that the yen might suddenly ratchet up.

So with both the fiscal and export avenues restricted, Japanese policy makers have little choice but to deal with the adverse exchange rate expectations which are at the root of the problem. We turn to this policy issue at the end of the paper.

The Banking Crisis

Can the low interest rate trap explain Japan's seemingly unending banking crisis? When nominal interest rates are compressed toward zero, lending margins for private commercial banks to good credit risks become unprofitable. This made it virtually impossible for Japanese banks to recapitalize themselves after the shock of the bursting asset bubble in 1991-92 had caused large unexpected loan losses.

Today (June, 2000), the prime loan rate in Tokyo and Osaka has been forced down to just 1.4 per cent whereas that in the United States is 9.5 per cent. True, the overnight deposit rate in Japan is just 0.1 per cent (Figure 6), whereas that in the United States is 6.4 per cent. But this still leaves the interest spread on bank loans over interest-bearing deposits of three percentage points in the United States to be twice as high as it is in Japan. And of course the spread between non-interest bearing demand deposits and the prime loan rate is much, much wider in the United States, i.e, 9.5 per cent less expenses, whereas in Japan it is 1.3 per cent less expenses. Thus, the more fundamental problem with Japanese banks is not so much their bad loan portfolio inherited from the past, but the lack of profitability in *new* lending.

The reluctance of Japanese commercial banks to lend at low interest spreads further dampens aggregate demand. Indeed, low profitability in commercial lending has led a desperate government to nationalize much of the flow of financial intermediation: public trust funds based on the huge postal saving system and the central bank itself are now lending, or have lent, directly to private trade and industry. Less directly, the government continually injects public capital into the banks to shore them up. But no amount of banking reform and restructuring of balance sheets will resolve the problems of inadequate profitability in the flow of *new* lending.

The Long-Term Bond Market and Keynes's Speculative Demand for Money

In the Great Depression, Keynes (1936) was obsessed with why *long-term* nominal interest rates might be stuck significantly above zero — even though short rates were nearly zero, and there appeared to be excess liquidity. In June 2000, the volatile interest rate on benchmark 10-year Japanese government

bonds (JGBs) is just 1.7 per cent — while longer term rates remain about two per cent. So with essentially a zero yield on very short-term government securities, the yield curve is quite steeply upward sloping.

But properly risk adjusted, Japanese long rates are still close to “zero”. As nominal interest rates on long-term yen bonds become low, their market prices become extremely sensitive to tiny changes in open market interest rates (see equation (8) above). Because of this price volatility, the perceived riskiness of holding them rises as nominal yields fall — as per the generation of our risk premium ρ in equation (9) above. In addition, Keynes also believed that, at very low interest rates bounded from below by zero, people expect that bond prices are more likely to fall than rise, i.e., that interest rates will rise in the future. (In Japan, this open-market risk premium on JGBs has sometimes been suppressed when the huge government trust funds have been the dominant buyers of new issues.)

The upshot of reluctance by the private sector to hold long-term yen bonds is twofold: a substantial risk premium gets built into long-term interest rates *and* what Keynes dubbed the “speculative demand for money” becomes indefinitely high. In the liquidity trap, new injections of base money by the central bank are simply absorbed by this speculative demand by households and firms with little or no effect on short or long-term interest rates. But Keynes (1936) presumed that the British economy, the one (he was analyzing) was financially closed to the rest of the world — perhaps not a bad assumption in 1936 when exchange controls were proliferating and international trade was imploding.

However, to understand more fully why a liquidity trap is sustainable in an open economy, such as present-day Japan’s, the meaning of the *speculative demand for money* must be augmented. Beyond the ordinary transactions and precautionary demands for money, people hold speculative cash balances in anticipation of two events whose precise timing is uncertain:

- (1) domestic bond prices suddenly fall (domestic interest rates rise) and so present a better buying opportunity, i.e., the Keynesian case, and
- (2) the domestic currency ratchets up in the foreign exchanges and presents a better opportunity for buying bonds in foreign currency.

Even when the current dollar value of the yen is not appreciating, the possibility of upward ratchets in the dollar value of the yen — as shown in Figure 8 — is necessary to keep Japanese households and firms holding large speculative domestic cash balances. Without this strong expectation, excess domestic cash would be invested in dollar assets yielding much more than their Japanese counterparts, i.e., four to six percentage points more at different terms to maturity. Thus, when the BoJ vigorously increases the monetary base, people just hold the excess cash rather than investing in volatile domestic bonds *or* in higher-yield and less-volatile foreign bonds.

The Constraint on Yen Depreciation

We have argued that the spot yen need not naturally depreciate in the face of “excess” domestic liquidity as long as the future yen is expected to be (erratically) higher. However, there exists an additional political-economic constraint on how much the spot value of the yen could possibly be manipulated by

the government to depreciate in real terms. Suppose, to stimulate the slumping but very large Japanese economy, unrestrained monetary expansionists (see Meltzer, 1998 and Krugman, 1998a and b, and Hoshi, 1998) aimed for a sharp yen depreciation below its current PPP rate. This would fail on several counts:

- (i) *The domino effect*: Other Asian currencies would be forced to depreciate (further). In particular, the finely balanced position of China, where the yuan/dollar rate has been stable for more than six years, would be undermined.
- (ii) *Protectionist responses from other industrial countries*: With Japan's trade surplus again burgeoning in the new millennium, a deep devaluation of the yen from its current PPP of about 115 per dollar would impose too much mercantile pressure on industrial competitors.
- (iii) *The expectations effect*: The fear of future yen appreciation could still remain and even be strengthened if expectations about the long-term value of the yen are little changed in the face of current yen depreciation.

Almost all protagonists in the current debate recognize the potential calamity if the yen were to depreciate sharply to well below its current PPP rate of about 115 to the dollar. (Although this potential problem is moot insofar as upward pressure on the yen in the foreign exchanges is so great that it is difficult or impossible for the Japanese government to contain it.) So Japanese monetary policy is trapped in two important respects: nominal interest rates cannot be reduced further and neither can the spot value of the yen be significantly devalued in the foreign exchanges.

5. Springing the Liquidity Trap

In proper long-term perspective, it is the yen's *forward* value (as measured by the interest differential between Japan and the U.S. at every term to maturity), and not the spot value, which is too high. Once the problem is properly diagnosed, the solution for ridding the Japanese economy of its deflationary psychology is straightforward: credibly stabilize the yen's dollar value into the indefinite future.

Unilateralism Is Not Enough

Why can't the Japanese government then solve the problem unilaterally by simply announcing a target value for the yen, say its current PPP of 115, into the indefinite future? The problem is a lack of credibility. In the liquidity trap where the domestic demand for base money is indefinitely large, the BoJ's monetary policy is helpless in stimulating the economy *or* in preventing the yen from rising (Okina, 1999). And, when the yen has been strong in the foreign exchanges, direct intervention by the Japanese government alone, i.e., not joint with the U.S. government, to sell yen and acquire dollars has met with only indifferent success in dampening yen appreciation. That is, the government sometimes succeeds in preventing the yen from rising in the short term, but fails to quash the expectation that the yen is likely to rise over the longer term.

Figure 20, courtesy of Stephen Jen (2000), strips out interest rate earnings on existing dollar reserves and then plots quarterly changes in Japan's official foreign exchange reserves against the course of the yen/dollar exchange rate. One can see the very large interventions in 1986-88, 1993-95, and in 1999-2000 — three periods when the yen was tending to appreciate quite strongly. In the most recent episode, Japanese foreign exchange reserves increased from \$222.5 billion in April 1999 to \$305.5 billion in April 2000 or about 37 per cent. (When the yen had been fixed credibly at 360 per dollar from 1949 to 1969, total exchange reserve accumulation was only about \$2.0 billion.) After Japan's asset bubble burst in 1991, her official foreign reserves were just \$61.9 billion. So almost 80 per cent of today's exchange reserves have been accumulated during the depressed 1990s over which there has still been some net yen appreciation. But even when the yen was not allowed to appreciate, the pressure on the government to prevent it was intense. Into the new millenium, the private sector has no assurance that the government will be able to keep the lid on.

In effect, unilateral intervention by the Japanese government lacks long-term credibility. This lack of credibility stems from the fear that forces outside the control of the Japanese government, i.e., mercantile pressure from the United States and increasing currency risk within Japanese private financial institutions, will at some point force the government to give up its attempts to keep the yen from rising.

A Bilateral Approach

In McKinnon and Ohno (1997), we devote chapters 10 and 11 to policies that would unravel the syndrome of the ever-higher yen by rationalizing the mercantile-monetary interaction between Japan and the United States. At the risk of oversimplifying the many institutional aspects covered in the book, our proposed economic pact between the two countries boils down to two complementary sets of policies:

- (1) *A commercial agreement limiting* bilateral sanctions in trade disputes and ending (future) pressure from the United States to get the yen up.
- (2) *A monetary accord* to stabilize the yen/dollar rate over the long term: the principle of virtual exchange rate stability.

Under (1), the United States would foreswear the use of "Super 301" and similar bilateral trade sanctions against Japan, with all trade disputes to be adjudicated by the World Trade Organization (WTO). Japan would agree to finish liberalizing all aspects of its economy, including services and agriculture. Both countries would acknowledge that neither Japan's current account surplus nor the US current account deficit can be "corrected" by manipulating the yen/dollar exchange rate. (1) is necessary to be able to implement (2).

Under (2), the two countries would agree on a benchmark value for the yen/dollar rate — say its current PPP rate, which is now about 115 yen per dollar. According to the principle of virtual exchange rate stability (McKinnon and Ohno 1997, p. 222), the two governments would always nudge the rate toward the benchmark, but only do so very actively if there were some sharp market movements in the wrong direction. For example, in early June 1998, the yen began to depreciate sharply, reaching 147 to the dollar by June 16 (Figure 8). On June 17, the Fed and the BoJ signaled joint or concerted intervention to reverse its course.

On June 17, the U.S. monetary authorities intervened in the foreign exchange markets, selling a total of \$833 million against the Japanese yen. The operation, which was divided evenly between the U.S. Treasury Department's Exchange Stabilization Fund and the Federal Reserve System, was conducted in cooperation with the Japanese monetary authorities..... The yen continued to appreciate throughout the remainder of the New York session, climbing over five yen to 136 yen to the dollar before closing at 136.51 yen to the dollar..... Later, Treasury Secretary Rubin stated "We are prepared to continue to cooperate in the foreign exchange markets, as appropriate."

(New York Federal Reserve Bank, June 1998).

This is not the only example of successful concerted intervention to stop the yen/dollar rate from moving in the wrong (by the PPP criterion) direction. After the yen had been run up sharply from 95 in January to reach 80 to the dollar in April 1995, a concerted official intervention by the Fed and the BoJ and other central banks stopped the run — and follow-up official interventions during the summer succeeded in driving the yen back down (Figure 20) from what had become a grossly overvalued level that was seriously depressing the Japanese economy. This permitted a partial recovery of the Japanese economy in 1996, until the now infamous tax increase of April 1997.

Dominguez and Frankel (1993) document several other successful concerted official interventions to stop "wrong-direction" runs for or against the dollar since the Plaza Hotel Agreement of 1985. To be successful, however, the authors emphasize that the official interventions must be *concerted and well signaled* so that the markets feel that follow-up actions will be forthcoming if necessary. Then, only minor amounts of official foreign exchange reserves need to be expended with no significant changes in short-term monetary policies. And the successful interventions of 17 June 1998 and of the summer of 1995 fit this Dominguez-Frankel mold almost exactly, as the above quotation suggests.

Virtual Exchange Rate Stability

We define virtual exchange rate stability to be that associated with countries agreeing on a long-run target for their (nominal) exchange rate, but which are not necessarily attempting a hard short-term fix. They will work together to contain pressures that drive the spot exchange rate substantially away from the long-term bench mark and their commitment to a long-term target is not in question. (For a further development of this concept of virtual exchange stability for promoting the recovery of the smaller East Asian economies, (see McKinnon, 2000.)

How would our proposal for securing virtual stability in the yen/dollar rate differ from these Plaza, or Plaza-Louvre, accords that already exist? The big omission from the existing Plaza-Louvre regime is that there is *no restraint on long-term drift in the market exchange rate, followed by a similar, albeit smoother, drift in the PPP rate* (Figure 10). While the Plaza-Louvre Accords encourage occasional concerted official interventions to stop wild movements in the market rate away from PPP in the short run, they do nothing to prevent the syndrome of the ever-higher yen over the longer term.

While keeping, and perhaps strengthening, the existing Plaza-Louvre conventions for concerted official interventions in the short run, our proposal would add a benchmark target for the long-term yen/dollar exchange rate⁹. The actual number the two countries chose, say, 115 yen to the dollar is less important than the very existence of the agreement itself.

Virtual exchange rate stability does not imply a commitment to stabilize the exchange rate in the short run within hard narrow bands. Nor does it attempt to target changes in the real exchange rate somehow defined as per Williamson (1994) or Wren-Lewis and Driver (1998). “Real” exchange rate targeting could be quite inconsistent with our objective of securing long-term stability in the nominal yen/dollar rate and Japan’s (nominal) WPI.

Instead, a benchmark parity for the nominal exchange rate is a device for harmonizing monetary policies between two countries in the longer term. But, in the short run, the two central banks would stand by to intervene directly, and in concert, in the foreign exchanges to reverse any sharp movements in the yen/dollar rate away from, say, 115. They would always reserve the right to occasionally nudge the rate towards the mutually agreed-on benchmark.

6. After the Trap is Sprung: The Transition

National monetary policy(s) must eventually support any such long run exchange rate target. But, once the expectation of an ever-higher yen was successfully quashed, almost all the monetary adjustment would be in Japan. Little or no change in the Federal Reserve’s policy of stabilizing the American price level, the independent anchor, would be necessary or desirable. Because the purpose of long-term stabilization of the exchange rate is to end deflationary pressure and spring the liquidity trap in Japan, that is where the main monetary adjustment would take place. What would the transition look like?

An international pact to stabilize the yen/dollar exchange rate over the long term is politically difficult but technically straightforward. In contrast, once expectations begin to shift away from ongoing yen appreciation and deflation, successfully managing domestic Japanese monetary policy in the transition will be technically intricate. For analytical purposes, let us suppose deflationary expectations end suddenly, what would happen?

- Nominal Japanese interest rates rise, and real interest rates fall, to world levels as the wholesale price level stabilizes. Holders of long-term yen bonds take a beating.
- New bank lending becomes profitable even though bank balance sheets remain a mess. But now a clean-up makes more sense. The banks can be “denationalized”.
- Private investment increases as fear of a sudden yen appreciation and overvaluation is eliminated.

⁹ This new agreement could encompass several major currencies—including the euro (McKinnon, 1996). But including the euro is not a pressing need: there is no syndrome of “an ever-higher euro”. Moreover, Euroland is a huge, semi-autonomous monetary area which is not greatly affected by fluctuations in the euro/dollar exchange rate.

- Private demand for new housing surges as the fear of ongoing decline in land values ends as the price level stabilizes.
- The Bank of Japan may actually have to contract the monetary base to allow nominal interest rates to rise while keeping the exchange rate steady.

When the liquidity trap is sprung, nominal interest rates must increase, even as real rates moderate because of the fall in deflationary expectations. Bank lending will revive as bank profit margins widen. Private investment should be further stimulated when the fear of sustained upward ratchets in “real” rates is eliminated. House purchases should become more attractive for these reasons and because potential home buyers see an end to the slide in property values.

Once the foreign exchange value of the yen and future Japanese price level are securely anchored, whether the BoJ should “tighten” or “ease” domestic monetary policy is, paradoxically, not clear. The possibly sharp increase in nominal interest rates would tend to reduce the demand for base money. If this effect dominates, the bank of Japan would need to reduce the monetary base quickly in order to prevent capital outflows and a sharp depreciation of the yen below its agreed-on dollar benchmark.

On the other hand, if the economy recovers sufficiently fast and the banking system is quickly re-commercialized, the demand for base money would increase on net balance. Re-privatization of bank lending should proceed naturally as commercial banks offer positive nominal interest rates and bid funds away from the postal saving system. So, in the transition, the BoJ must stand ready to either withdraw or inject base money into the system, always being guided by pressure in the foreign exchanges.

With this exchange rate anchor, and after a successful transition, the economy should achieve approximate price level stability as measured by Japan’s WPI, but *not* necessarily by the CPI. Figure 21 shows the fall in Japan’s WPI relative to its CPI. For many decades, the price of services in Japan has been rising relative to goods prices as per the so-called Balassa-Samuelson effect. Since 1985, the BoJ has been deceived by the relative stability in its CPI, while the WPI has fallen substantially and better reflects deflationary pressure (along with falling land prices) in the economy overall.

Consequently, the WPI is a better (although not perfect) deflator for converting nominal into “real” interest rates (McKinnon 1979). It is also more directly affected by the exchange rate. With exchange stability and economic recovery, the system would settle down to higher growth in the Japan’s CPI — say two or three per cent per year, while the WPI remained approximately stable in the American mode¹⁰.

10 Further calls for inflation beyond this, Itoh 1998, Krugman 1998, Meltzer 1998, and so on, are unwarranted.

References

- Asher, David L. Robert H. Dugger, "Could Japan's Financial Mount Fuji Blow Its Top?" MIT Japan Program 2000, Working Paper Series # 00 01, May 2000.
- Bernanke, Ben, and Mark Gertler, "Agency Costs, Net Worth, and Business Fluctuations," *American Economic Review*, LXXIX, 1989, pp. 14-31.
- Cargill, T., M. Hutchison, and T. Ito, *The Political Economy of Japanese Monetary Policy*, MIT Press, 1997.
- Dominguez, K. M., and J. A. Frankel, *Does Foreign Exchange Intervention Work?* Institute for International Economics, Washington D.C., 1993.
- Hicks, J. R., "Mr Keynes and the Classics," *Econometrica*, vol. V, no. 2, April 1937.
- Hoshi, Takeo, "Expansionary Monetary Policy is Precisely the Right Prescription," Ronso, Toyo Keizai, September 1998.
- Ito, Takatoshi and Motoshige Itoh, "Can Targeted 3-4% Inflation be Achieved by Quantitative Easing," Ronso, Toyo Keizai, September 1998.
- Itoh, Motoshige, "Inflation Policy is also an Option," Nihon Kezai Shimbun, 25 June 1998.
- Jen, Stephen L. "On the World's Largest Foreign Reserve Holdings." in Morgan Stanley Dean Witter, *FX Pulse*, April 13, 2000, pp. 6-7.
- Keynes, John Maynard, *The General Theory of Employment, Interest, and Money*, Macmillan, London, 1936.
- Komyia, Ryutaro, *Economics of Trade Surpluses and Deficits: Absurdity of Japan-U.S. Friction*, Toyo Keizai Shimpo Sha, Tokyo, 1994.
- Krugman, Paul, "Japan's Trap," <http://web.mit.edu.krugman/www/japtrap.>, May 1998.
- _____, "Japan's Slump and the Return of the Liquidity Trap," *Brookings Economic Papers* 2, 1998, pp. 137-206.
- McKinnon, Ronald I., *The Rules of the Game: International Money and Exchange Rates*, MIT Press, 1996.
- _____, "The East Asian Dollar Standard, Life after Death?" for World Bank Workshop, *Rethinking the East Asian Miracle*, published in *Economic Notes*, Feb 2000, pp. 31-82.

McKinnon, Ronald I. and Kenichi Ohno, *Resolving Economic Conflict Between the United States and Japan*, MIT Press 1997; Japanese translation, Nihon Keizai Shimbun 1998.

Meltzer, Allan, "Time to Print Money," *Financial Times*, 17 July 1998.

New York Federal Reserve Bank, "Treasury and Federal Reserve Operations," April-June 1998.

Okina, Kunio, "Monetary Policy Under Zero Inflation: A Response to Criticisms and Questions Regarding Monetary Policy," Discussion paper 99-E-28, Institute for Monetary and Economic Studies, Bank of Japan, 1999.

Posen, Adam, *Restoring Japan's Economic Growth*, Institute for International Economics, Washington, D.C. 1998.

Sakaguchi, Chikara, "Japan Has Run Out of Options to Help Boost Fragile Economy," *Financial Times*, May 5, 2000, p. 4.

Smithers, Andrew, "Japan as a Laboratory for Economic Theory," Report No. 140, Smithers and Company Limited, London. January 2000.

Ueda, Kazuo, *Monetary Policy under Balance-of-Payment Disequilibrium*, Toyo Keizai Shimpo Sha, 1992.

_____, "Japanese Monetary Policy, Rules or Discretion? Part II," Bank of Japan's Seventh International Conference, Oct. 26-27, 1995.

Williamson, John, "Estimates of FEERS," in *Estimating Equilibrium Exchange Rates*, ed. By John Williamson, Institute for International Economics, 1994.

Wren-Lewis, S. and R.L. Driver, *Real Exchange Rates for the Year 2000*, PA 54, Institute for International Economics, May 1998.

Yoshino, N. and M. Yoshimura, "The Exogeneity of Monetary policy Instrumental Targets and Money Supply," Bank of Japan Monetary Research Institute, 1995.

Table 1: General Government Gross Financial Liabilities

(As a percentage of nominal GDP)

	1991	1992	1993	1994	1995	1996	1997	Estimates and Projections			
								1998	1999	2000	2001
US	65.5	68.1	69.7	68.9	68.3	67.7	65.4	62.4	59.3	57.1	55.2
Japan *	58.2	59.8	63.0	69.4	76.0	80.6	84.7	97.3	105.4	114.1	122.1
Germany **	40.1	43.4	49.0	49.2	59.1	61.9	62.8	63.3	62.6	61.7	60.2
France	40.3	44.7	51.6	55.3	59.4	62.3	64.5	64.9	65.2	64.6	63.4
Italy	107.4	116.1	117.9	124.0	123.1	122.2	120.4	118.2	117.7	115.2	112.3
UK	40.1	46.9	56.2	53.7	58.9	58.5	58.9	56.4	54.0	51.2	48.6
Canada	80.9	88.2	96.8	98.0	99.2	98.9	94.1	91.7	86.9	82.5	78.5

Note:

* Includes the debt of the Japan Railway Settlement Corporation and the National Forest Special Account from 1998 onwards.

** Includes the debt of the German Railways Fund from 1994 onwards and the Inherited Debt Fund from 1995 onwards.

Source: OECD Economic Outlook. December 1999. p. 226

Table 2: Projected Public Sector Borrowing for Japan

(Fiscal Stimulus plus Debt Service)

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Needed Fiscal Stimulus	2.4	51.6	46.1	54.6	54.9	54.0	48.6	46.6	44.0
Debt Service (4% rate)	18.4	19.2	22.1	24.5	27.2	31.4	36.3	42.0	50.8
Total Borrowing Need	20.8	70.8	68.2	79.1	82.0	85.4	84.8	88.7	94.8
Total Public Sector Debt		551	613	680	762	847	947	1049	1163
Total Public Sector Debt/GDP		112%	124%	136%	151%	166%	184%	202%	221%

Source: Asher, David, and Robert Dugger (2000). "Could Japan's Financial Mount Fuji Blow its Top?"

MIT Japan Program 2000. Working Paper Series #00-01. p. 5

Note: Projections assume that fiscal stimuli continue.

Figure 1: Japan GDP Growth Rates

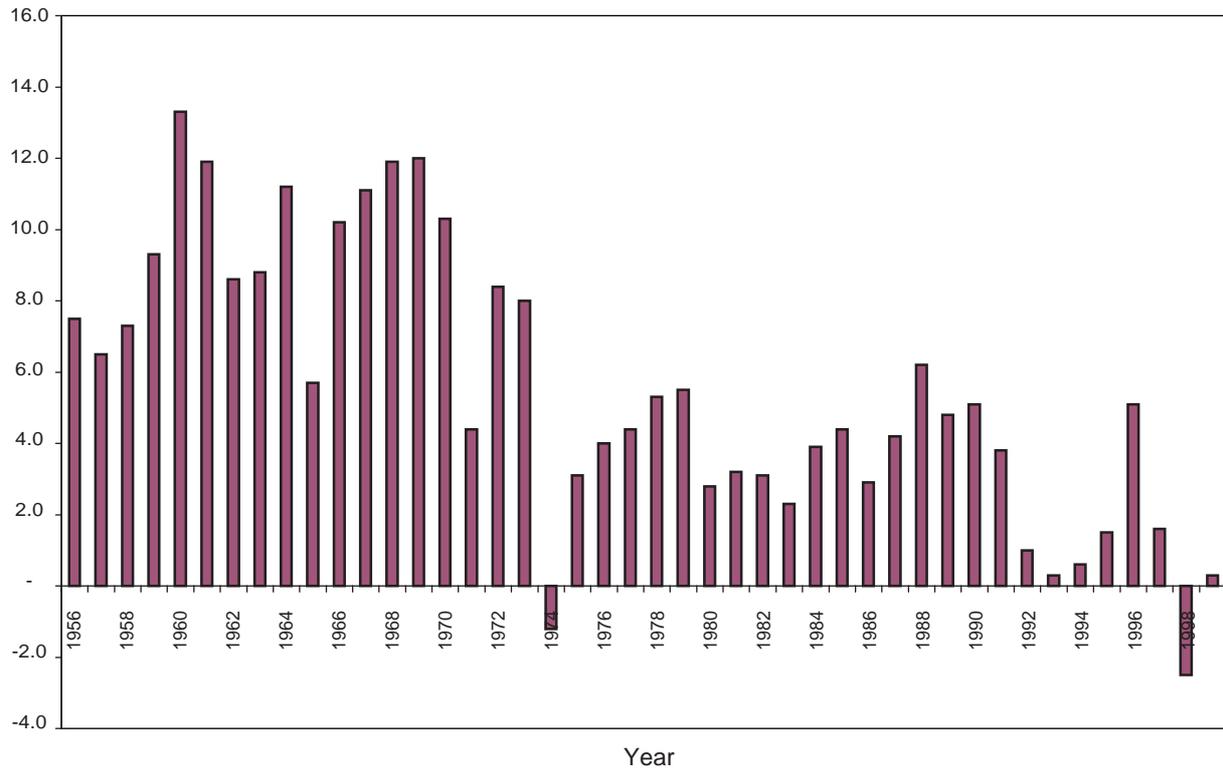
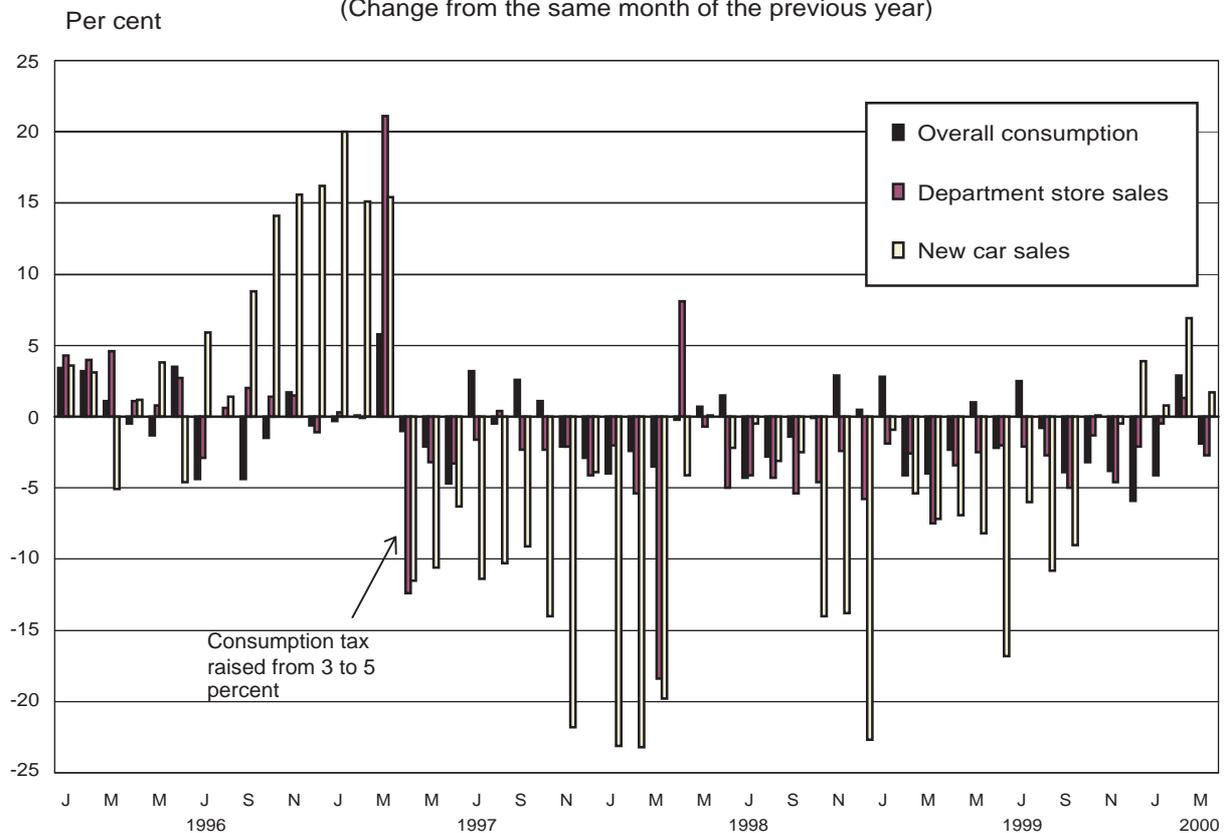
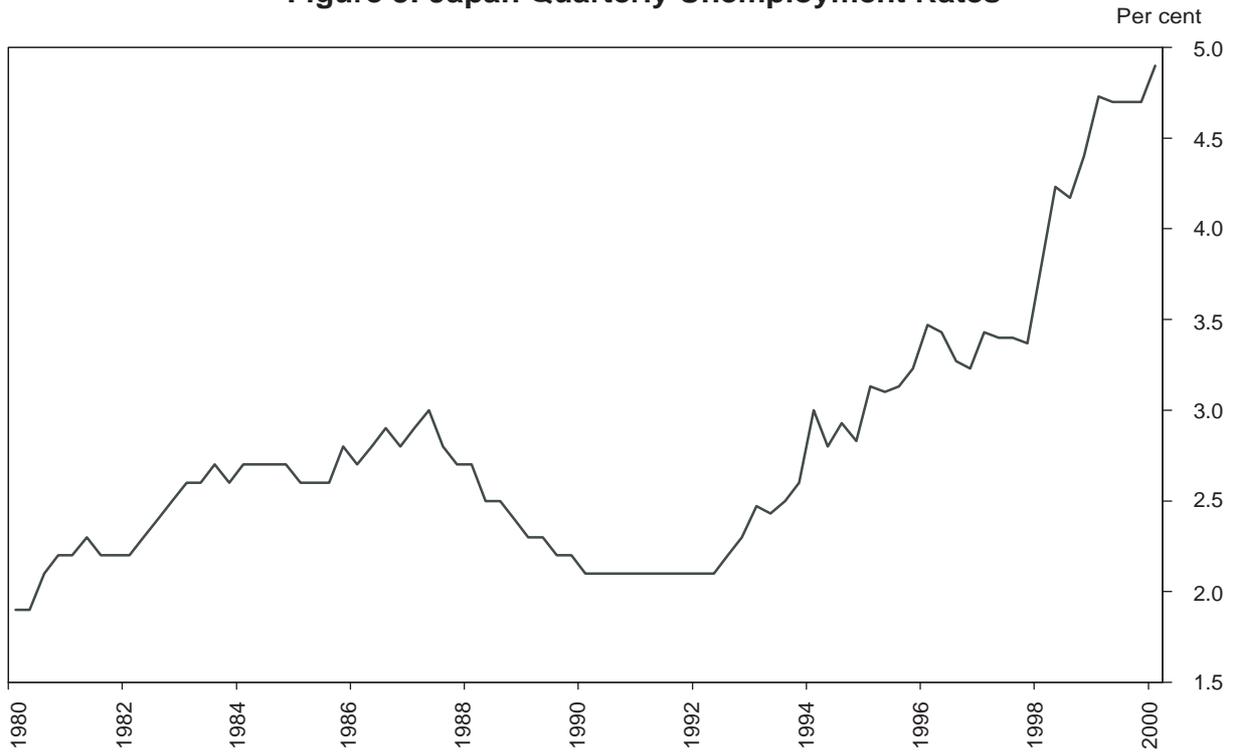


Figure 2: Japan Consumption Expenditure
(Change from the same month of the previous year)



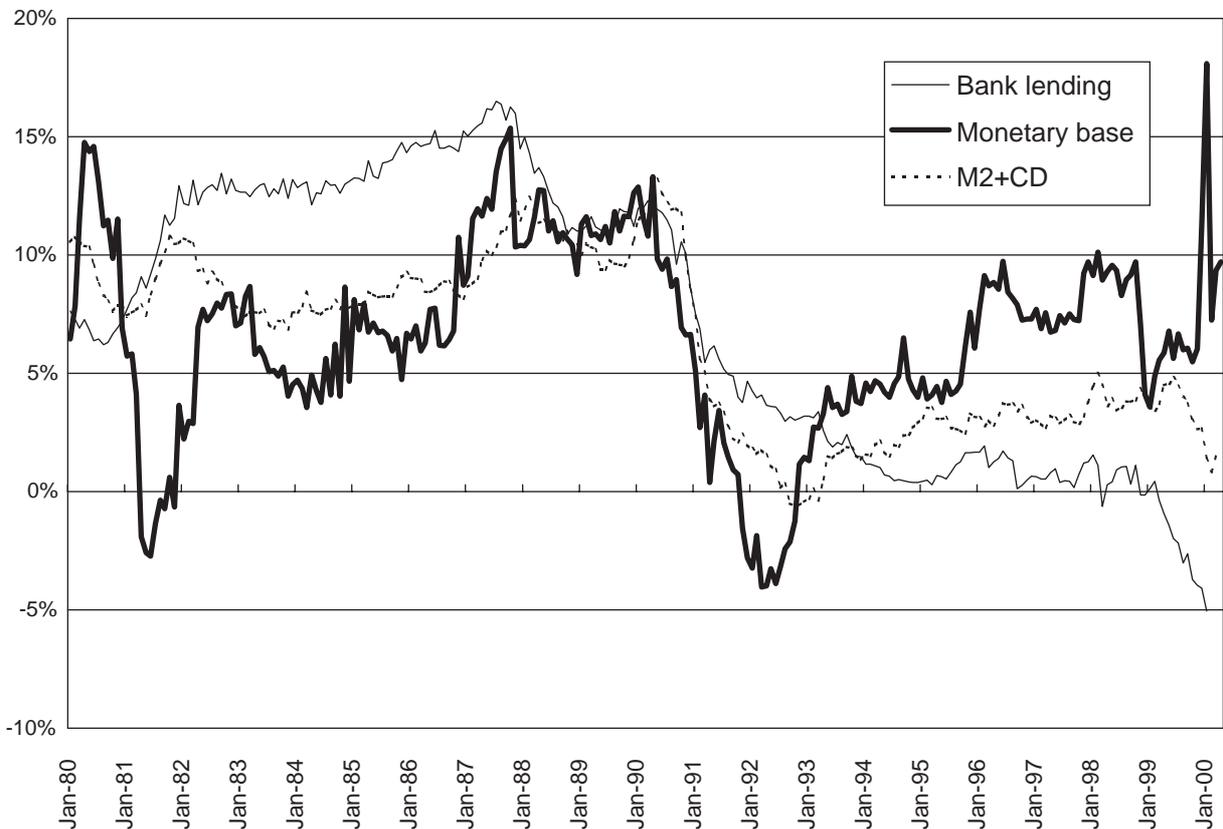
Sources: Management and Coordination Agency (overall real consumption expenditure); Department Stores Association (department sales); Japan Automobile Dealers Association (new car sales).

Figure 3: Japan Quarterly Unemployment Rates



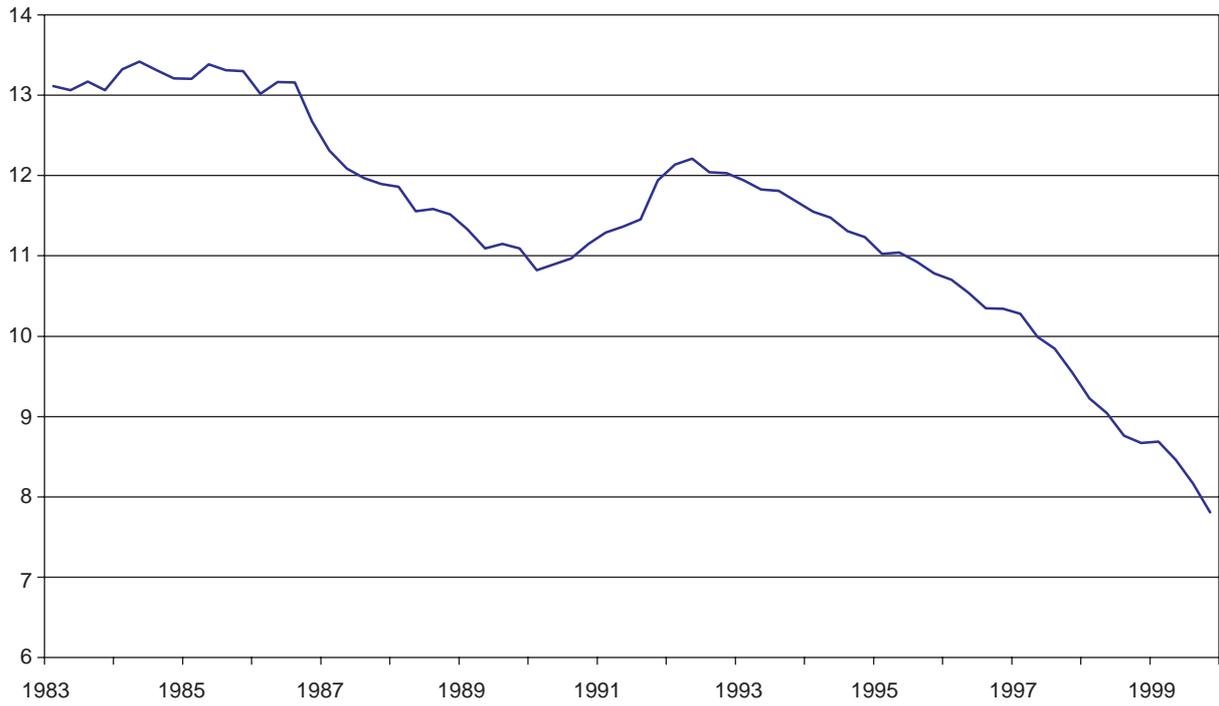
Note: The Feb. 2000 estimate of the unemployment rate was used for 2000Q1.
Sources: IFS, OECD Quarterly Labour Force Statistics.

Figure 4: Money and Credit
(12-month growth)



Source: Bank of Japan.

Figure 5: Velocity of Monetary Base

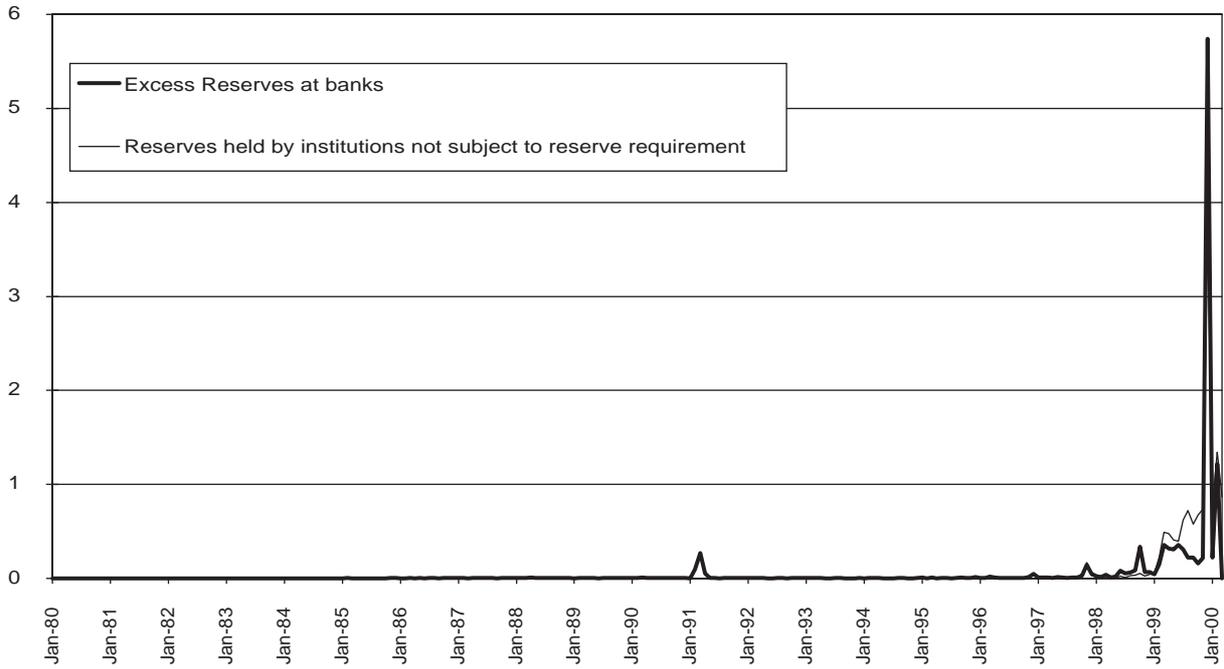


Sources: Seasonally-adjusted quarterly GDP figures are from the Economic Planning Agency. Seasonally-adjusted monetary base numbers are from the Bank of Japan. Monthly numbers were averaged to obtain quarterly numbers.

Figure 6: Japanese Short Rates



Figure 7: Excess Reserves
(Trillions of yen)



Source: Bank of Japan.

Figure 8: Nominal Yen/Dollar Exchange Rate

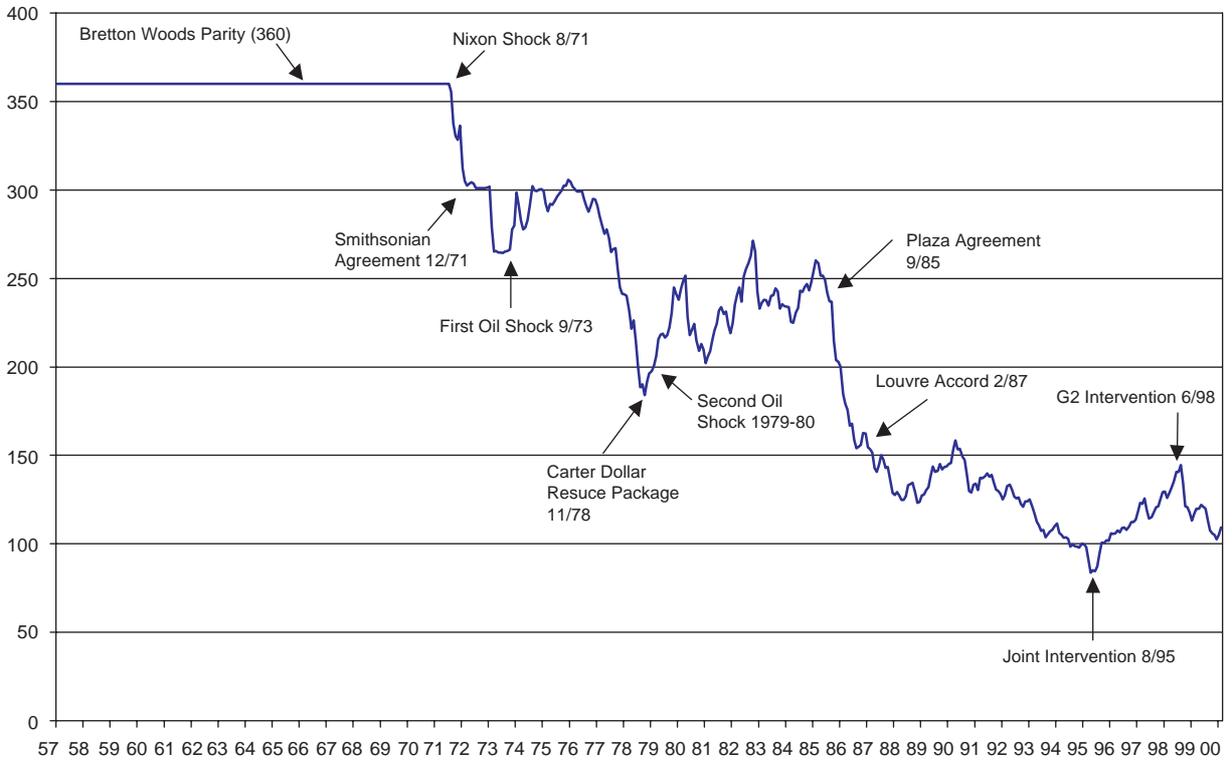
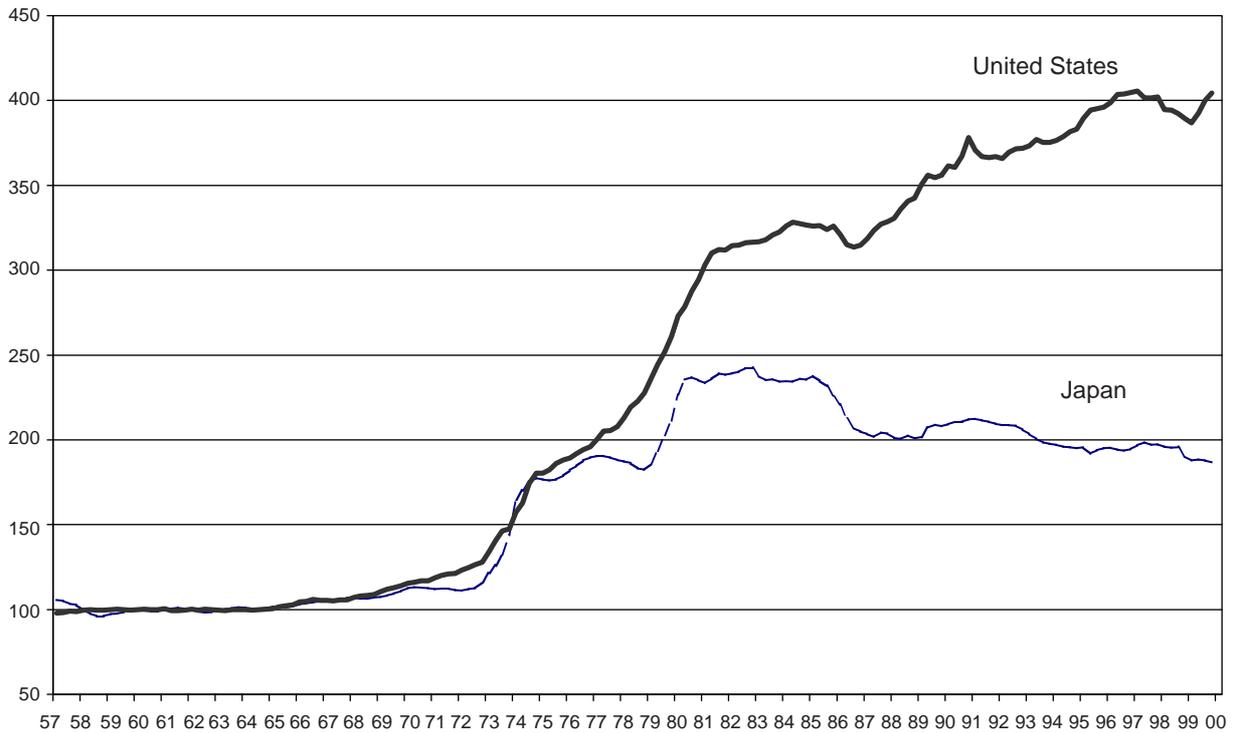


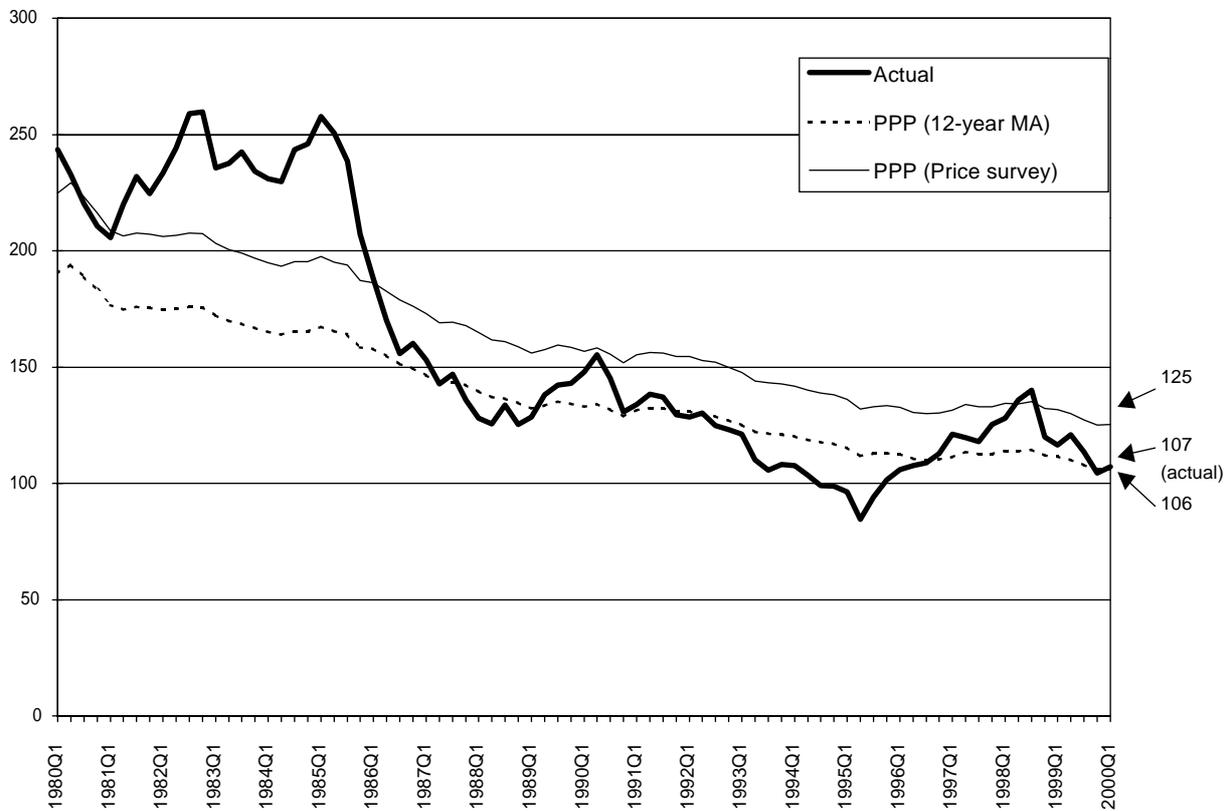
Figure 9: Price Level of Tradable Goods (WPI)

(1960Q1 = 100)



Source: IFS

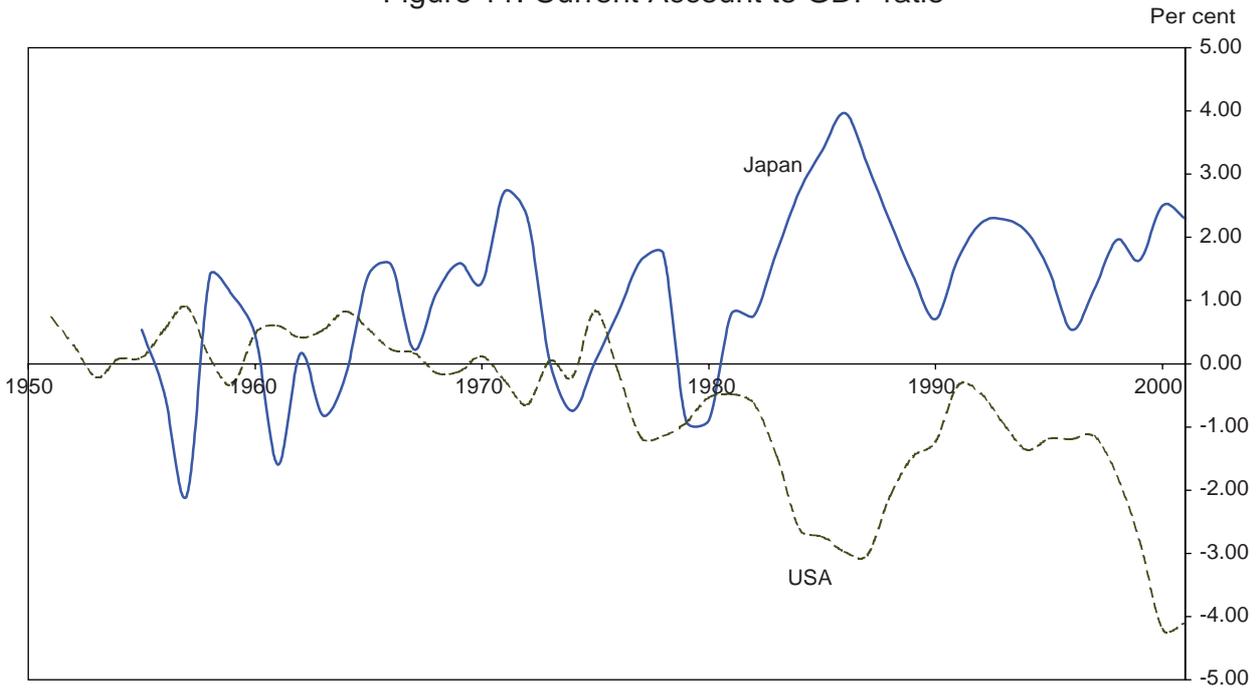
Figure 10: Actual and PPP Yen/Dollar Rates



Note: The PPP yen/dollar rate is calculated in two ways: the first assumes that there was equal tendency for overvaluation and undervaluation during the last 12 years, and the second takes the price survey result of manufactured goods in 1992:Q2 as the base (150 yen/dollar).

Sources: IMF, International Financial Statistics and Japan Economic Journal, various issues.

Figure 11: Current Account to GDP ratio



Note: Estimates for 2000-2001 were obtained from The Economist (Apr. 29, 2000).

The US estimate for 1999 was obtained from <http://www.ita.doc.gov/td/industry/otea/usfth/aggregate/H00t05.txt>

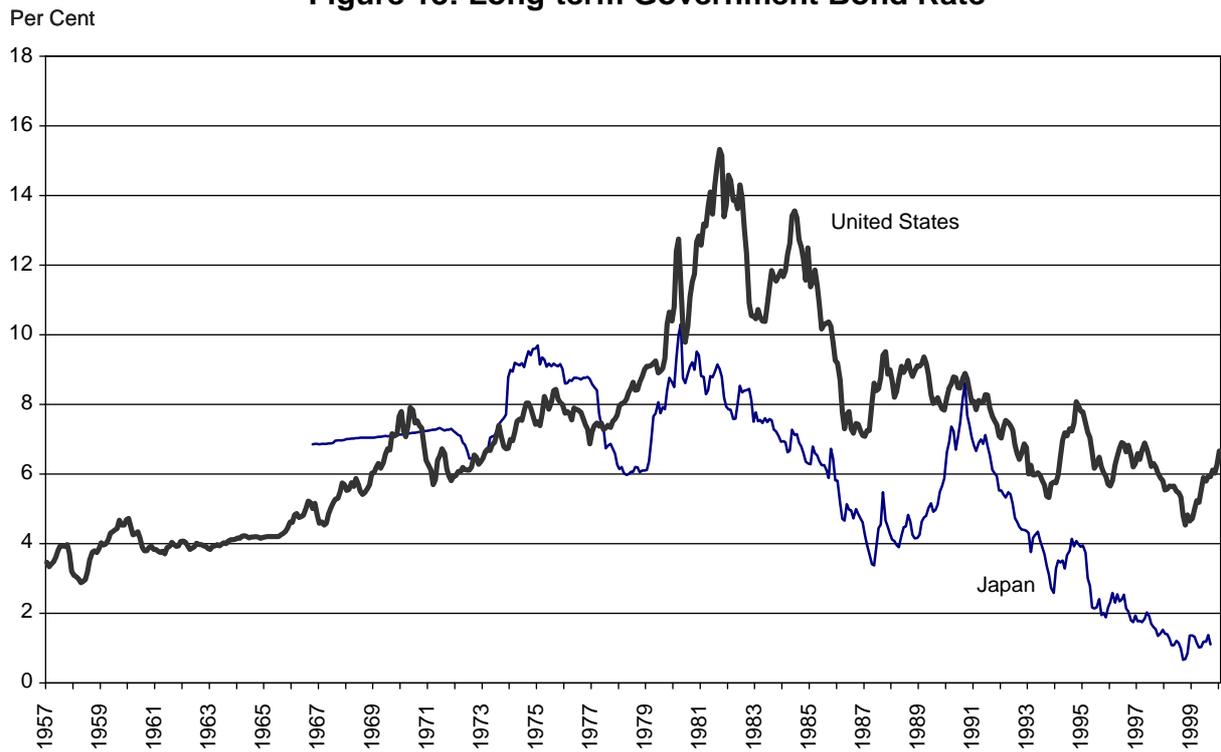
Figure 12: Foreign Assets as a Percentage of Total Assets
Japanese Deposit Money Bank and Insurance Companies



Note: Deposit money banks include domestically licensed banks, foreign banks in Japan, Shinkin banks, Norinchukin Bank, Shokochukin Bank, and Zenshinren Bank. Insurance companies include both life and non-life insurance companies.

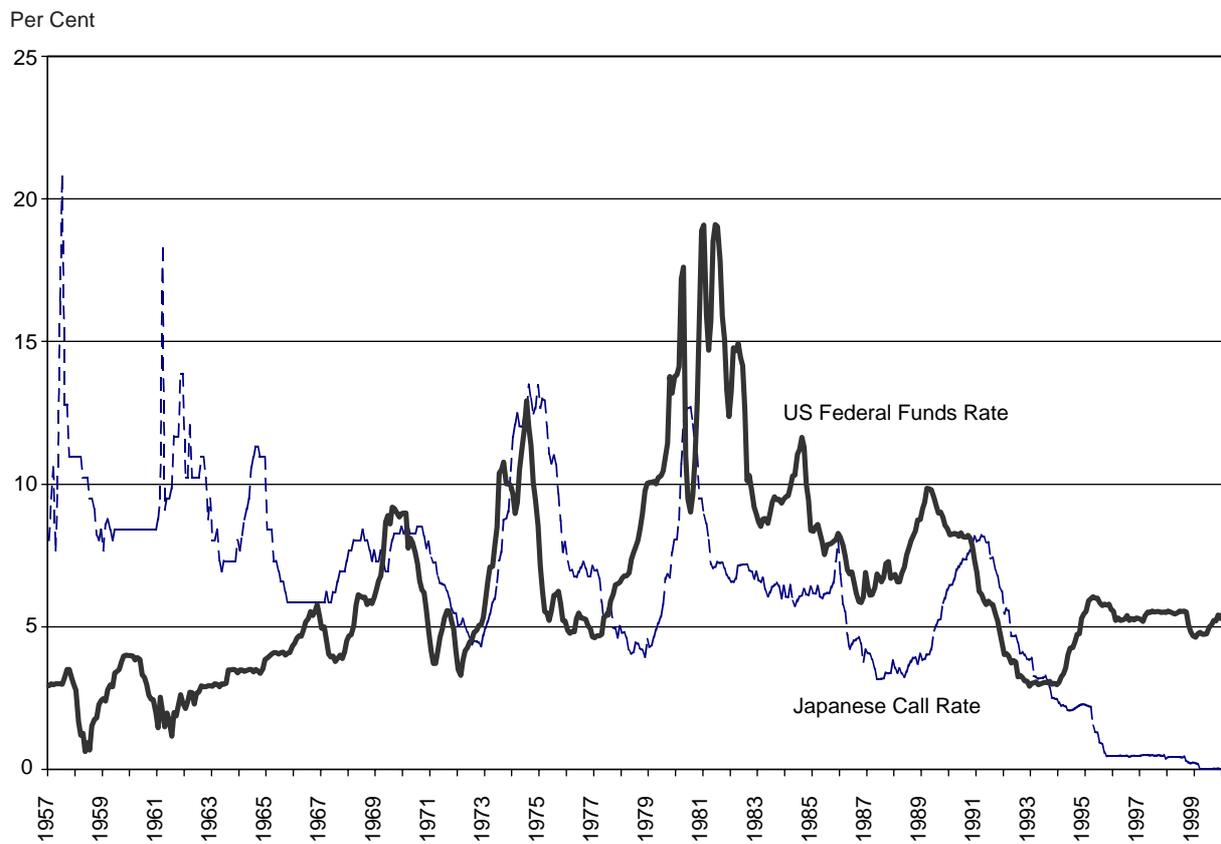
Source: Bank of Japan.

Figure 13: Long-term Government Bond Rate



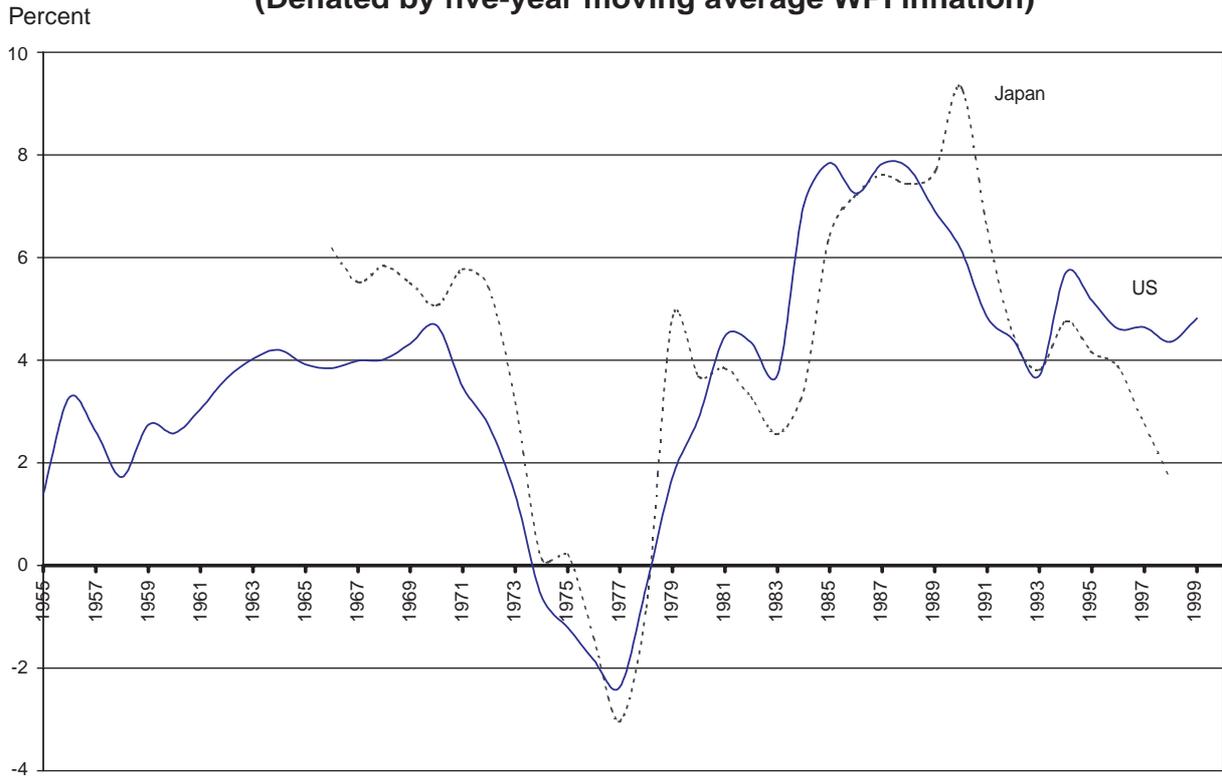
Source: IFS

Figure 14: Short-term Interest Rate



Source: IFS

**Figure 15: Real Long-Term Interest Rates
(Deflated by five-year moving average WPI inflation)**



Source: IFS

Figure 16: Japan's Risk Premium in the Bond Market

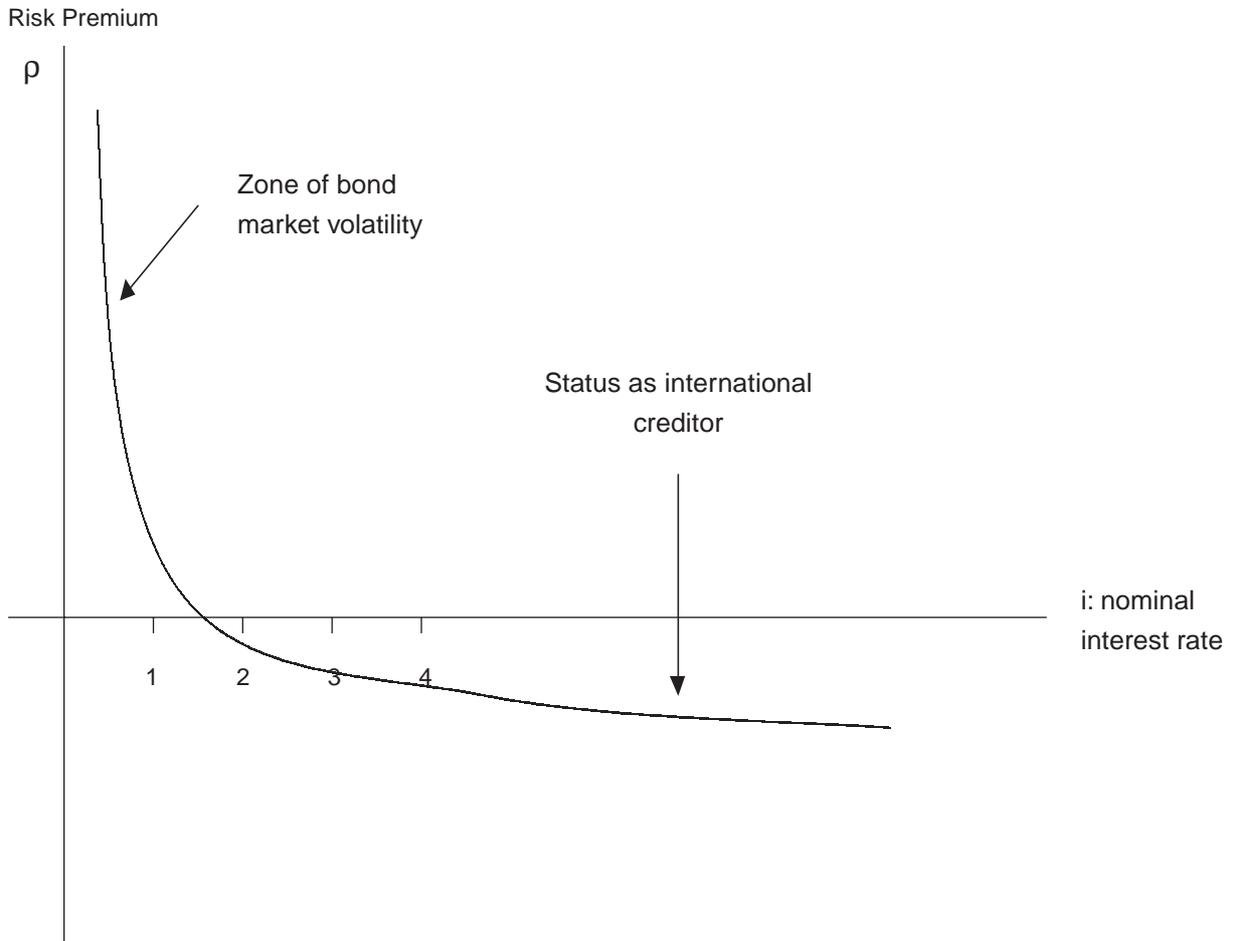


Figure 17: Marginal Efficiency of Investment - Risk Adjusted

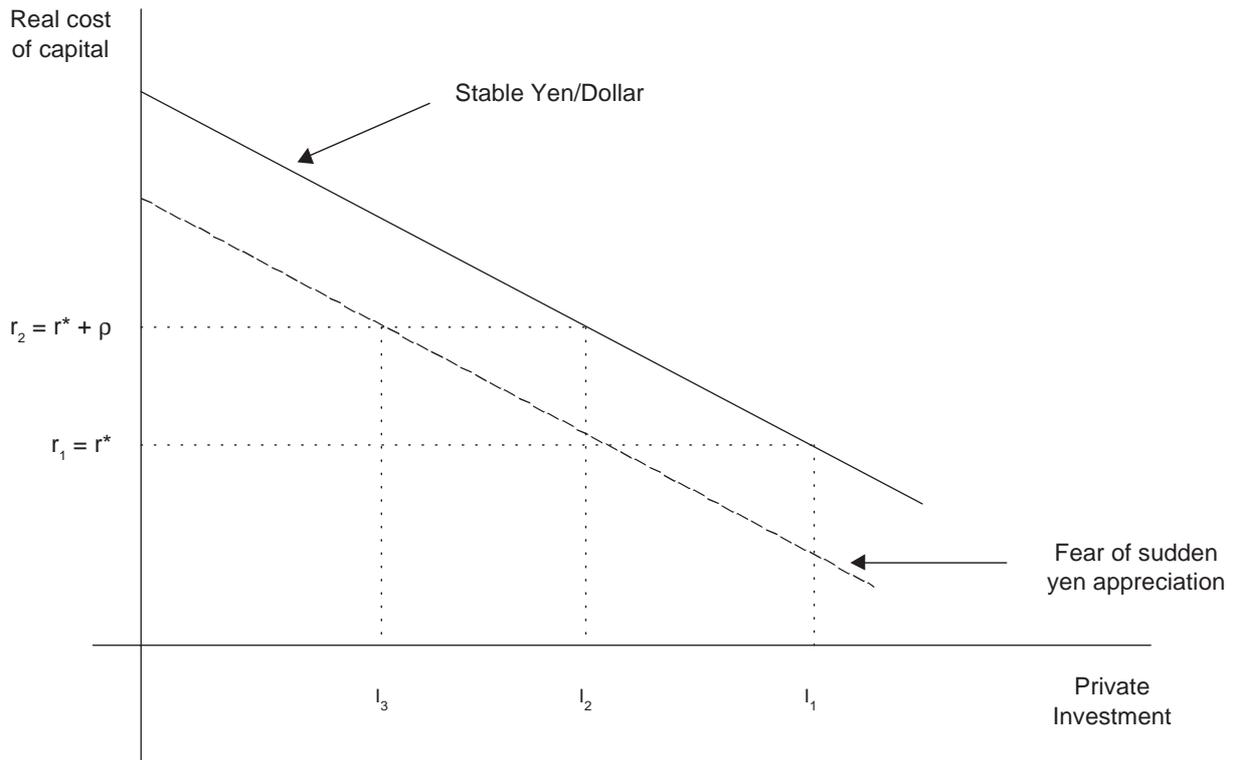
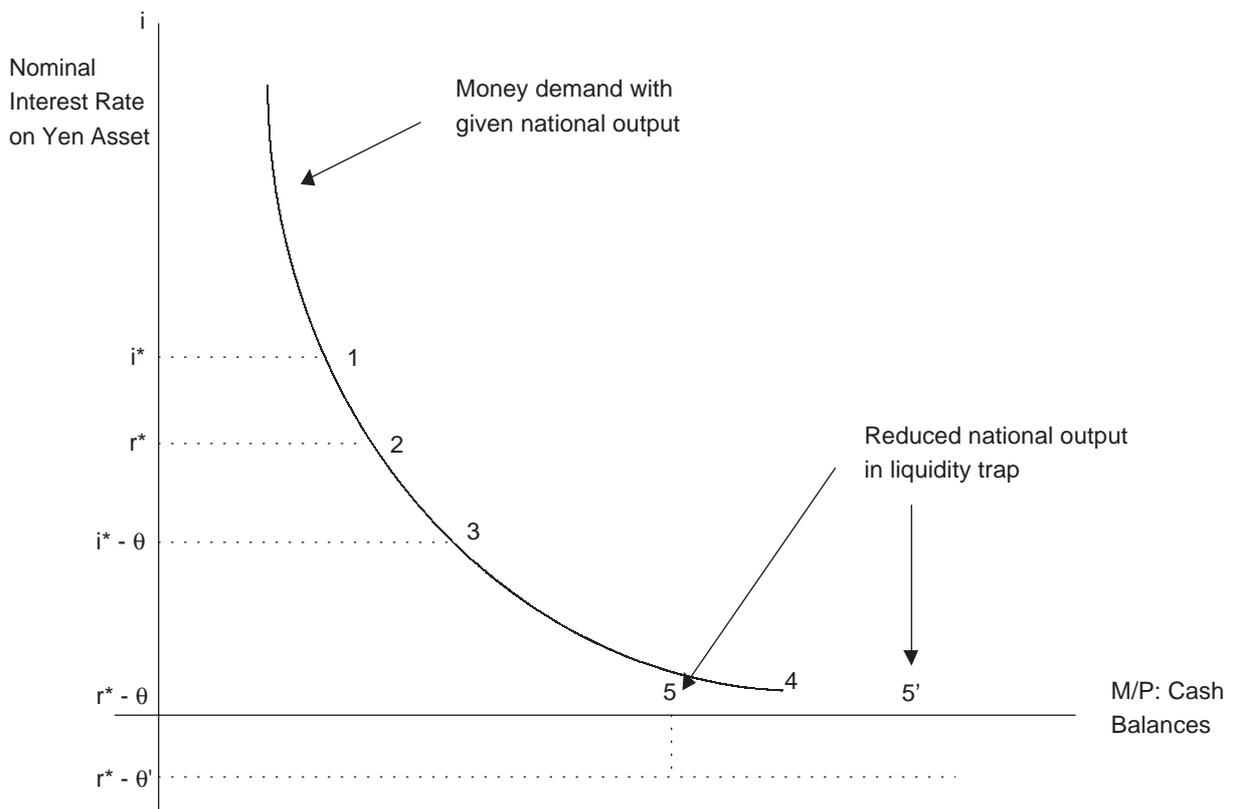


Figure 18: Nominal Interest Rates, Exchange Rate Expectations and Liquidity Preference



Notes: i^* , r^* are US nominal and real interest rates
 θ is expected annual rate of yen appreciation

Figure 19: ISLM Analysis and Externally Imposed Real Interest Rates

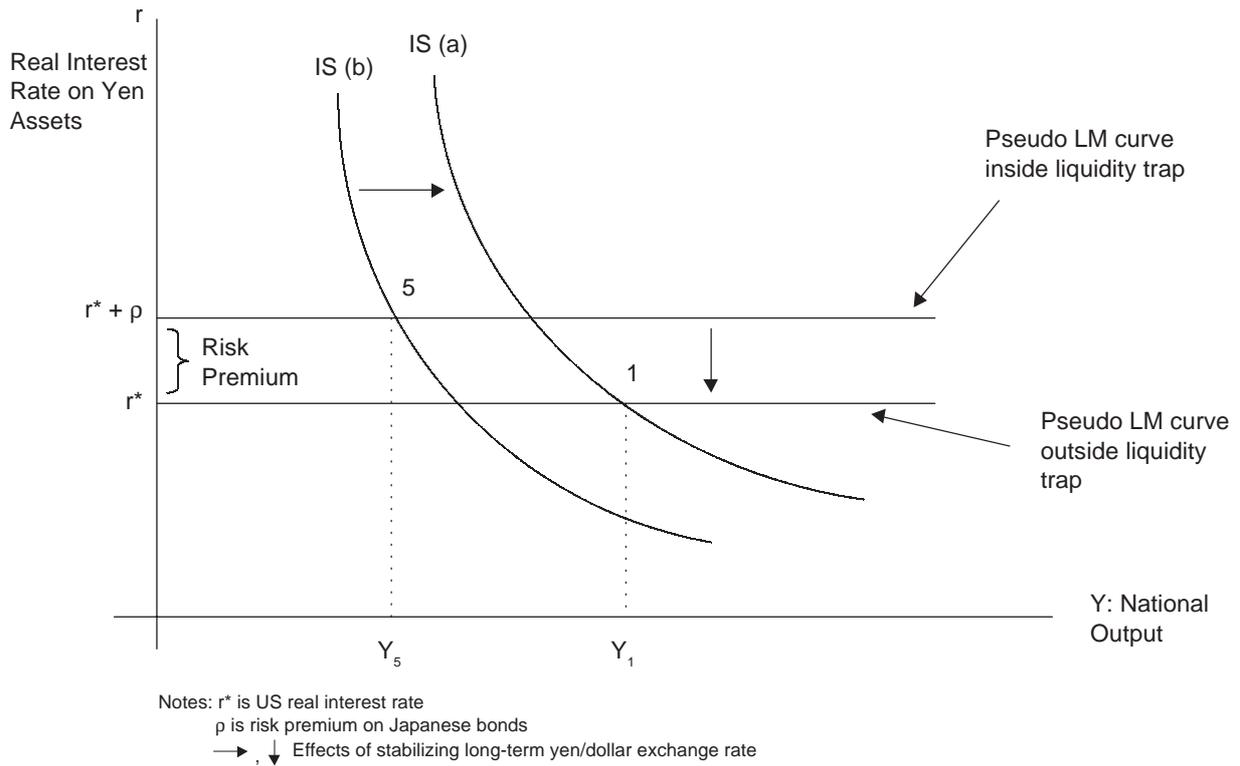
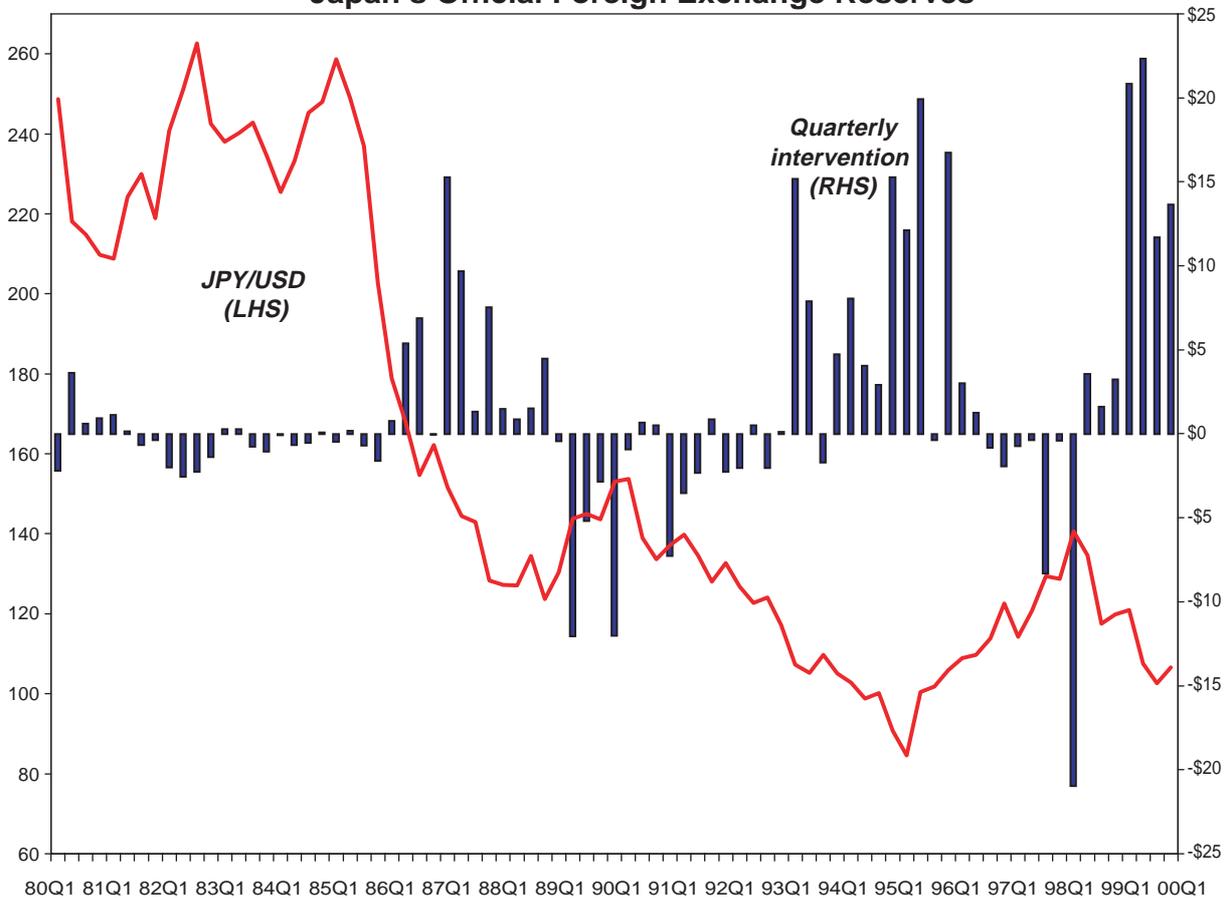


Figure 20: Yen/Dollar Rate Quarterly Changes in Japan's Official Foreign Exchange Reserves



Source: Stephen Jen, FX Pulse, April 13, 2000 (Morgan Stanley Dean Witter)

Figure 21: Japanese Consumer and Wholesale Price Indices

(January 1985 = 100)

