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On Alternatives to Aggressive Demand Policies
to Revitalize the Japanese Economy

Kiyohiko G. Nishimura
And
Makoto Saito

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On Alternatives to Aggressive Demand Policies to Revitalize the Japanese Economy†

Kiyohiko G. Nishimura
Faculty of Economics
University of Tokyo
7-3-1 Hongo Bunkyo Tokyo, 113-0033, Japan
nisimura@e.u-tokyo.ac.jp

and

Makoto Saito
Faculty of Economics
Hitotsubashi University
2-1 Naka Kunitachi Tokyo, 186-8601, Japan
makoto@econ.hit-u.ac.jp

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Abstract

In this paper we identify scarcity of profitable private investment opportunities starting in the early 1990s or even earlier as a fundamental cause of the prolonged Japanese stagnation during the 1990s and early 2000s. Ample empirical evidence indicates that the economy has been largely at the private equilibrium, not in “disequilibrium” constrained by zero nominal interest bounds and/or widespread liquidity constraints. Consequently, aggressive aggregate demand policies, especially zero nominal interest policies coupled with aggressive quantity easing, are ineffective in escaping from stagnation and deflation. Reflation policies based on money financing are also examined and shown to have strong distributional side effects with little effects on employment and outputs, so that they alone are not likely to solve the problem. Then exchange rate policies are investigated but their feasibility is questioned politically, though they are more promising than other aggregate demand policies. Thus, aggregate demand policies are not likely to effective without new, structural initiatives to increase investment.

Although the Japanese economy is at the private equilibrium, we argue that it is far from the social optimum in the sense that many socially desirable investment opportunities have not been exploited fully. The real challenge is thus to develop a policy framework in which such socially desirable but privately unprofitable investment is encouraged. For this purpose, we propose Socially-Oriented Investment Trusts (SOITs) to implement socially profitable investment on private initiatives.

Key words: aggregate demand policy, monetary policy, fixed investment, productivity, zero interest rates, liquidity constraints, socially-oriented investment trusts.

JEL classification number: E21, E22, E41, E52, E62, O47.
1. Introduction

In vigorous policy debates over the Japanese economy, two competing views have been surfaced with regard to the cause of the prolonged recession in the 1990s (and the early 2000s), often referred to as a lost decade.

On the one hand, its persistency is often attributed to inadequate macroeconomic policy, in particular that of aggregate demand management. Those in favor of this view presume that weak aggregate demand, caused by various constraints such as zero-nominal-interest bounds and/or widespread liquidity constraints, is largely responsible for the serious recession.

In fact, since the mid-1990s, Japan’s macroeconomic policy had been developed on the presumption of weak aggregate demand. Both aggressive fiscal and monetary policy had been implemented one after another. The Obuchi Cabinet had carried out massive fiscal policy since 1998, thereby piling up a substantial amount of public debts, while the Bank of Japan has guided overnight call rates (inter-bank rates) even below 0.5 percent since 1995. This observation leads the proponents of the weak-demand view to argue that even the implemented massive macroeconomic policy had been too little and too late, and merely passive in magnitude, given the severely depressed state of aggregate demand.

Facing rapid accumulation of national debts that aggravate serious concern among tax payers, some proponents of this view shift their emphasis from active fiscal expansion to even more aggressive monetary policy, including the introduction of inflation targeting, aggressive quantity easing, and a heavy intervention in foreign exchange markets, regarding a deflationary pressure as the most destructive factor for the Japanese economy. Others maintain that both fiscal and monetary policy should be extremely expansionary through close coordination between the government and the Bank of Japan; some of them even propose that fiscal expenditures should be financed by newly-issued money.

On the other hand, there has been a completely different view on a lost decade in Japan. Motivated by an intuition that demand-side problems only are not likely to be able to explain such a prolonged stagnation, several researchers, mostly academic, stress that productivity slowdown during the 1990s and scarcity of profitable private investment opportunities in that period or even earlier are responsible for the persistent recession. They refer to significant empirical evidence in favor of this view. Given the second view, aggregate demand management alone is not effective, and probably even harmful in revitalizing the stagnant Japanese economy.
In Section 2, we examine the second view against the first by exploring empirical evidence found in existing literature. We shed light on sharp contrast between the two views concerning monetary policy. Those in favor of the first view regard that zero interest bounds and/or liquidity constraints cause a “disequilibrium” situation, and that real interest rates implied by market rates are still too high relative to underlying equilibrium rates. In contrast, those advocating the second consider that low real interest rates prevailing in markets are an equilibrium consequence of the above-mentioned low productivity and scarcity of profitable investment opportunities. We demonstrate that the first view is inconsistent with observations.

In Section 3, we examine the effect of current aggressive monetary policy of the central bank under the pressure of proponents of the first view, which is often called the zero interest rate policy. We show that this policy has already yielded harmful effects on not only financial markets, but also Japan’s economy as a whole. In particular, we emphasize that the zero interest rate policy has failed to create inflationary expectations among market participants on the contrary to the original intention of an “aggressive” easy-money policy. We also point out that, as a tail of the same coin, the household sector’s funds tend to “stagnate” in money markets due to excessive money demand driven by zero interest rates and in the Japanese Government Bond market boosted by expectations of continuing low interest rates. Consequently, funds of the household sector do not flow into the real sector. We also investigate even more aggressive monetary policy of money-financing operations and show that they alone are not likely to be effective in promoting economic activities even though they are able to kindle inflation, and they have serious distributional side effects. We then examine exchange rate policies leading to gradual yen depreciation, increased economic activities and moderate inflation. However, we find that the scope of such exchange rate policies is rather limited and their political feasibility is in question.

In Section 4, we propose a completely different scheme from aggregate demand policies to revitalize the Japanese economy, based on the second view explained earlier that the essential cause of the Japanese stagnation is low productivity and scarcity of profitable private investment opportunities. We argue that, though private returns on investment are rather low, their social returns are much higher for some capital goods, reflecting complex, intertwined externality present in a densely-populated, developed, and matured economy like Japan. Japan is far from the social optimum, and thus new investment in these socially desirable but privately unprofitable capital stocks is necessary to move her toward the social optimum.

In doing so, however, private initiatives should be put forward, since the
government has proven itself as not being adept in this regard. We propose to use a market-based system to induce efficient investment in these socially desirable but privately unprofitable capital stocks. We also examine the problem of financing this type of investment in a private economy, and outline a tax system to support it. Finally, Section 5 contains some concluding remarks.

2. Scarcity of Profitable Investment Opportunities as A Major Cause of Japanese Stagnation

2-1 Evidence of Scarcity of Profitable Investment Opportunities

There is ample evidence that profitability of private firms deteriorated significantly during the 1990s. Figure 2-1 shows returns on equity (ROE) among the 400 representative firms (excluding financial corporations) listed in the first section of the Tokyo Stock Exchange (so-called NOMURA 400). Returns on equity ranged between 10 percent and 15 percent in the 1970s, between 5 percent and 10 percent in the 1980s, and 0 percent and 5 percent in the 1990s with a few percent points of fluctuation in each period. This pattern in ROE suggests that there was a substantial downward shift in profitability among the representative firms in the early 1990s. Moreover, the decline of firm profitability is even more pronounced in small firms than large firms represented by NOMURA 400. Thus, firms’ profitability declined substantially, suggesting that profitable investment opportunities were scarce.

As documented in Table 2-1, accounting data also suggest that before-tax net returns on capital\(^1\) declined substantially in the 1990s. Net returns on capital ranged from around 6 percent to 8 percent in the 1980s, while they reduced to about 3 percent in 1995, and even below 2 percent in 1999.

Scarcity of profitable investment opportunities also shows up in aggregate statistics. Ando (2002) conducts an elaborate examination of the Japanese National Accounts, and demonstrates in a clear manner that vigorous investments in plants and equipment, a high level of the capital-output ratio, and low rates of returns on fixed capital have been a consistent pattern exhibited for the Japanese data since at least 1970. Ando suggests

\[\text{\footnotesize\textsuperscript{1}}\text{As mentioned in the notes of Table 2-1, the movement of the reported returns on capital is informative and reliable whereas the level itself may not. Both reported net returns and corporate stocks tend to be upward biased because of problems in compiling data but the bias is stable over time.}\]
that the recession of the 1990s can be explained by the magnitude of capital losses incurred by the household sector as a result of low rates of returns on fixed capital in a stagnant economy with a dwindled hope of firms’ growth, although he still has some reservations about this inference because of difficulties encountered in working with the Japanese National Accounts data.

One caveat is that his finding does not indicate any evidence that the Japanese economy is over-accumulated or dynamically inefficient after capital losses on rapidly accumulated capital is realized in the 1990s. The rate of return on capital net of tax and depreciation was rather low, but still positive in 1996 (ranging from 1.6 percent to 2.9 percent depending on the choice of capital and sectors).

2-2 Productivity Slowdown and Biased Technological Progress

The above-mentioned low rate of returns on capital is the consequence of not only the rapid accumulation of physical capital, but also slow and biased technological progresses. Several empirical researches based on growth accounting present strong evidence that a significant productivity slowdown occurred in the Japanese economy during the early 1990s. The most representative study of this kind is Hayashi and Prescott (2002), who calculate the growth rate of total factor productivity (hereafter, TFP) for a period between 1960s and 1990s. In their calculation, they assess work force fairly carefully, in particular with due consideration for the nation-wide reduction of the workweek length, thereby avoiding underestimates of TFP by overestimates of labor force growth.

According to their estimates, the TFP growth is 6.5 percent in the period between 1960 and 1973, 2.2 percent for 1973-1983, 3.6 percent for 1983-1991, and 0.5 percent for 1991-2000. As these figures clearly demonstrate, the Japanese economy experienced a substantial reduction in the TFP growth during the early 1990s.

One of their interesting results is that, under the assumption that a permanent reduction in TFP occurred in the early 1990s, a standard neo-classical growth model is able to account very well for the prolonged recession during the 1990s. In particular, the model can explain the upward trend of the capital-output ratio during the 1990s. This refutes an often-made claim that models assuming that the economy is in equilibrium all the time cannot explain a prolonged recession of this magnitude.

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2 In Japan, most firms and public institutions adopted a working-hour reduction scheme between 1988 and 1993. As a result, the average hours worked per week reduced from 44 hours to 40 hours.
One may argue that TFP growth slowdown is the result of insufficient aggregate demand, not its cause. In fact, TFP growth is historically reduced substantially in recessions. More generally, studies based on growth accounting treat changes in productivity exogenously; therefore, it would be rather difficult to infer from only this kind of quantitative study, major and essential reasons for the above productivity slowdown starting at least in the early 1990s.

Overcoming the above methodological difficulty, Nishimura and Shirai (2002) attempt to identify sources of the Japanese productivity slowdown in the 1990s. They employ a methodology allowing imperfect competition and quasi-fixedness of some inputs to avoid usual criticisms against conventional growth accounting. They also use detailed industry level data of capital stocks and labor inputs. In particular, they identify information and communication technology (ICT) stocks independently and the heterogeneity of labor force explicitly with respect to age and education. These data are important since technological progress in the 1990s is driven by ICT technology, and the Japanese labor force is rapidly aging during this period. Figure 2-2 taken from their study clearly shows a significant slowdown in the rate of technological progress in many industries.

Their regressions of industrial technological growth on possible determinants show a remarkable result that a rapid progress in ICT is biased against the traditional strength of the Japanese economy, that is, tacit knowledge of workers and firms nourished by long-term relationship among them. Capital (both physical and human) whose productivity depends heavily on these long-term relations becomes obsolete and in some cases has no market value. Physical capital stocks with little market value are left under-utilized. Workers (especially old workers) whose human capital becomes obsolete find it very difficult to get a job that utilizes their human capital. Although the magnitude of these effects is hard to measure in the methodology of growth accounting, they seem to be the heart of under-utilization/under-employment problems of the current Japanese economy.

Nishimura and Shirai also find that broadly-defined services industries including

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3 Growth accounting is based on the presumption that all production factors are utilized.
4 In a sense, the Japanese economy is in equilibrium involving under-utilization and under-employment. The official unemployment statistics may be misleading in that it does not gauge the magnitude of under-employment. However, as explained in the previous footnote, there is an important caveat that under-utilization and under-employment are not incorporated well in growth accounting framework reported in the text. Their incorporation is one of the most important agenda of future research.
retail and wholesale trade, transportation and telecommunication, and narrowly-defined services industries show very disappointing technological progress compared with their counterparts in the United States. This is no wonder since long-term customer-supplier relationship is most important in these services industries. This fact points out the difficulty in realizing ICT productivity in Japan, where personalized relations are highly appreciated and mechanical treatments are strongly detested.

In addition, their regression results show that there is no network externality effect in observed technological progress. This is particularly disappointing, since investment in ICT does not bring about an increase in technological progress as the Japanese government hopes in adopting the e-Japan program.

The discussion in Sections 2.1 and 2.2 suggests that a prolonged recession of the 1990s is an equilibrium consequence of a significant slowdown in technological progress and scarcity of profitable investment opportunities. Productivity slowdown is likely caused by ICT advancement biased against the traditional advantage of the Japanese economy. The rate of returns on capital may be low for quite a long time, but a prospect of rapid growth persuades firms to keep a high level of investment in a growing economy until 1990. In the 1990s, productivity slowdown made it clear that a rapid growth was over and firms faced squarely the low rate of returns. Scarcity of profitable investment opportunities looms and firms cut their investment.

2-3 Are Real Interest Rates Too High? –Possibilities of the Binding Zero-Bound of Interest-Rates and/or Liquidity Constraints

Those in favor of aggressive monetary policy, however, have a very different view of the Japanese economy from the one described in Sections 2.1 and 2.2. In this section, we examine their arguments.

These proponents of aggregate monetary policy usually stress that the Japanese economy has been still sluggish in activity and mildly deflationary in price levels, although the Bank of Japan (hereafter, BOJ) has maintained nearly zero nominal interest rates since February 1999. Then, they argue that the main reason of the persistent sluggishness is inadequate aggregate demand policy making real interest rates too high relative to equilibrium rates.

One strand of their thoughts emphasizes that nominal interest rates are constrained to be non-negative, and thus they are prevented from being adjusted to large negative shocks, and that these too high real interest rates suppress aggregate demand of either or both of consumption and investment. We examine this argument here. There is
another strand of the thoughts that is based on more traditional AD-AS model. We will discuss it later.

In both cases, they argue that the equilibrium-based Fisher equation no longer holds, and they have the following inequality:

\[ \text{Equilibrium Real Interest Rate} < \text{Nominal Interest Rate} - \text{Expected Inflation} \]

Given this diagnosis, even more aggressive monetary policy has been proposed as a tool to promote an inflationary pressure, thereby fixing disequilibrium in real interest rates.

There are two classes among monetary models that embody the above feature, depending on which component of aggregate demand is constrained, consumption or investment. In both classes, a forward-looking behavior is explicitly taken into consideration in representing a representative agent’s intertemporal decision. We may here want to make one remark that they only consider the zero bound of nominal interest rates and pay little attention to the aspect of strong money demand at the zero rate of nominal interest, that is, the zero cost of money holdings.

**Too Little Consumption Due to Too High Real Interest Rates**

First, Krugman (1999) and others characterize the current state of the Japanese economy as too high real interest rates in terms of intertemporal allocation between current and future consumption. In Krugman’s model, given prevailing market asset prices, a representative consumer is first assumed to achieve dynamically efficient allocation without any friction such as transaction costs, liquidity constraints, or participation constraints. Then, the following Euler equation holds at market rates of interest rates and expected inflation:

\[
E_t \left[ \frac{1 - \frac{U'(C_{t+1})}{1 + \rho} (1 + i_t)P_t}{U'(C_t)} \frac{P_{t+1}}{P_t} \right] = 1
\]

where \( E_t \) is the expectation operator conditional on time-\( t \) information, \( \rho \) is the time preference rate, \( i_t \) is a nominal interest rate prevailing at time \( t \), \( U'(C) \) is marginal utility of a representative agent, and \( C_t \) and \( P_t \) are per-capita consumption and a nominal price level at time \( t \).

Krugman then argues that Japan hits the zero bound of nominal interest rate or
\[ i_t \geq 0. \]  

He stresses that, because of this zero bound, the real interest rate implied by financial markets are too high in Japan as a result of largely negative permanent productivity shocks. To put differently, a real interest rate formed in the markets, \(-E_t \frac{\pi}{\bar{\pi}} + 1\) (note that \(i_t = 0\) since the nominal interest rate hits the bottom), is too high relative to an equilibrium one (a natural rate).

If the consumption profile determined by equation (1) is evaluated in terms of equilibrium (natural) rates of real interest \((-E_t \frac{\pi}{\bar{\pi}} + 1\)), then the Euler equation no longer holds. Instead we have the following inequality

\[
E_t \left[ \frac{1}{1 + \rho} \frac{U'(C_{t+1})}{U'(C_t)} \frac{\dot{P}_t}{\bar{P}_{t+1}} \right] < 1,
\]

The above inequality indicates that the consumption growth (an inverse of the relative marginal utility \(U'(C_{t+1})/U'(C_t)\)) is too high with respect to an equilibrium rate of real interest \((-E_t \frac{\pi}{\bar{\pi}} + 1\)); in other words, current consumption is too little relative to future consumption.

Once the above inequality is accepted as a description of the current Japanese economy, then raising current consumption relative to future consumption by propping up expected inflation from a current level to a desirable level would be surely welfare-improving for the representative agent. Consequently, the above model serves as a solid foundation for inflation-oriented aggressive monetary policy.

Seemingly, Krugman’s setup is consistent with the above-cited finding by Ando (2002) in that both of them regard too little consumption (too much investment) as something to be fixed by macroeconomic policy; Ando is indeed sympathetic toward Krugman’s proposal in this regard.

What is extraordinary about Krugman’s argument, however, is that he attempts to justify the above initial setup by claiming that equilibrium real interest rates are negative three or four percent points per annum in the long-run; he cites both aging population and stagnating technological progress as major reasons for this extremely
pessimistic scenario of long-run equilibrium. Under this scenario, even slight deflation at zero nominal interest rates makes real interest rates implied by markets still too high relative to such a pessimistic (negative) long-run equilibrium rate.

In Section 2.4, we will argue that the initial setup of binding zero nominal interest bounds is inconsistent with empirical evidence. Here, we only make a brief comment on one important issue specific to Krugman’s argument.

His extremely pessimistic scenario immediately implies that Japan’s economy is dynamically inefficient in the long-run in that depreciation exceeds gross profits on fixed capital. However, it is hard to imagine even on a logical basis that dynamic inefficiency would arise for a developed economy like Japan, which implements large-scale intergenerational transfer schemes including social security and fiat money. As indicated by fairly modest estimates by Ando (2002), returns on capital net of depreciation was rather low but still positive even after capital losses on physical capital were materialized in the 1990s.

Too Little Investment Due to Too High Real Interest Rates

A more traditional argument to rationalize aggressive monetary policy is based on the IS-LM type model. A modern version of the IS-LM model, including Woodford (1996), Bernanke and Woodford (1997), and McCallum and Nelson (1999), introduces a linear version of Euler equation (1) into a part of the IS equation as follows:

\[
\begin{align*}
\ln C_t &= E_t \left[ \ln C_{t+1} - \varepsilon (i_t - \pi_{t+1} - \rho) \right], \\
\text{(4)}
\end{align*}
\]

where \( \pi_{t+1} \) is an inflation rate between time \( t \) and \( t + 1 \), and \( \varepsilon \ (> 0) \) is an elasticity of intertemporal substitution.

Equation (4) is rewritten as

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5 More rigorously, whether an economy is dynamically inefficient or not depends on not only depreciation rates, but also population growth rates. The Japanese population is indeed declining mildly, but at the same time, the age structure of population is older and older. Then, one unit of consumption sustains more people with adjustment for equivalent measures in the aging society (except possibly for medical expenditure, but its effect is rather difficult to determine). Thus, it is reasonable to put less weight on negative population growth rates in judging dynamic inefficiency.

6 According to Abel et al. (1989), all of the OECD countries were dynamically efficient in that gross profits exceed depreciation.
\[
\ln C_t = E_t \sum_{\tau=t}^{\infty} \left[ -\varepsilon(t, \pi_{\tau+1} - \rho) \right],
\]

(5)

The above forward-looking equation indicates that as in Krugman (1999), a continuation of too high real interest rates \((i_t - \pi_{t+1})\) depresses current consumption.

A little tricky part of this modern version is that aggregate consumption \(C_t\) is replaced by aggregate demand \(Y_t\) in equations (4) and (5).

\[
\ln Y_t = E_t \sum_{\tau=t}^{\infty} \left[ -\varepsilon(t, \pi_{\tau+1} - \rho) \right]
\]

(6)

Then, \(Y_t\) is often treated as not only aggregate consumption, but also either aggregate investment or net export, although the distinction among the three matters significantly for policy implications.

The above version of aggregate demand models is often implicitly linked to a more traditional version where aggregate investment is determined mainly by real interest rates. In this way, several monetary economists including Bernanke (2000) tend to interpret “too weak aggregate demand due to high real interest rates” as “too little investment on physical capital,” and thus describe the Japanese economy as that of too little investment. Again, on the presumption that real interest rates are too high relative to an equilibrium rate (a natural rate) at the zero bound of nominal interest rates, aggressive monetary policy is proposed as the most important instrument to reduce real interest rates by raising expected inflation.

In these models, not only the zero bound of nominal interest rates but also the linkage from aggressive monetary policy to inflationary expectations is an important issue to be examined. There are two conceivable routes in the presence of zero-nominal-interest bounds. The first one is ordinary open market operations. However, this route is likely to be ineffective when nominal interests, that is, the opportunity cost of holding money, are close or equal to zero, as we will demonstrate in Section 3. Seemingly aware of this issue, Bernanke considers the second route: money-financing operations such as “helicopter-dropped money”. However, as we will discuss in Section 3, money-financing operations are likely to be ineffective to increase employment and outputs and have serious distributional consequences that are not adequately examined by macroeconomists. Thus it is only a last resort to take and it should be accompanied by measures to alleviate such undesirable consequences and to coordinate expectations.
Putting the same argument as Bernanke in a different way, and paying careful attention to the forward-looking aspect of equation (6), Reifschneider and Williams (2000), Jung, Teranishi, and Watanabe (2001), and others point out that not only expected inflation, but also long-run nominal interest rates (approximated by the average of short-run nominal interest rates) are still an important component of real interest rates. They propose a commitment of continuation of zero nominal interest rates for a substantial period for a zero-bound-constrained economy, with emphasis on positive impacts of putting long-run nominal interest rates to zero on aggregate demand, in particular investment decision. Some BOJ board members seem to adopt this reasoning in order to justify BOJ’s commitment to the zero interest rate policy implemented in April 1999.

Finally, we consider an argument for aggressive monetary policy, which has different logic from the ones discussed above. Iwata (2001) recommends inflation-oriented monetary policy as an instrument to reduce real interest rates, and to promote aggregate investment. However, instead of the zero-bound constraint of nominal interest rates, he emphasizes liquidity-constrained investment as a direct cause of depressed aggregate demand during the 1990s. Based on the traditional aggregate supply and demand framework, he claims that the real interest rate is higher than the equilibrium rate (natural rate) and thus equilibrium-based Fisher equation fails to hold, not because of the zero bound of nominal interest rates, but because of the output gap due to too little aggregate investment constrained by liquidity constraints. He suggests that in the presence of this output gap, aggressive monetary policy can raise aggregate demand and expected inflation through easing liquidity constraints without any impact on nominal interest rates, thereby lowering real interest rates.

In his argument, contrary to our findings in Section 3, Iwata seems to assume that the quantity theory of money holds even when nominal interest rates are close to or

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7 Their argument is not so apparent as it seems. A binding zero bound of nominal interest rates itself is costly for an economy; in other words, the Lagrange multiplier associated with this constraint is non-zero in this setup. Hence, an intentional continuation of such a costly economic policy may not be optimal with much wider classes of policy instruments. In addition, optimal policies may be influenced by the nature of stochastic shocks on natural rates. If negative shocks are largely persistent or large negative shocks may hit again, the long-run commitment to zero rates results in a lengthy continuation of costly states. In such alternative setups, to lift a costly constraint of zero nominal interest rates as soon as possible might be optimal.

8 While the BOJ introduced the zero interest rate policy in February 1999, it was in April 1999 that the BOJ committed itself to its continuation until a deflationary concern would be wiped out.
equal to zero, and claims that aggressive monetary policy thus leads to inflation. In
addition, he suggests that in the presence of the output gap, an increase in aggregate
outputs due to stimulated investment will raise national income, and consequently
aggregate savings; then, an increase in savings mitigates an equilibrium upward
pressure on real interest rates.

2-4 Non-binding Constraints: Low but Positive Equilibrium Real
Interest Rates as an Equilibrium Consequence

Non-binding Zero Bound of Nominal Interest Rates

While Section 2.3 shows a variation in rationales for aggressive monetary policy,
there is one common feature among these monetary models: a presumption that a large
negative productivity shocks makes real interest rates too high in the presence of the
zero bound of nominal interest rates. As argued repeatedly so far, it is quite reasonable
to propose aggressive monetary policy from this presumption as a tool to raise expected
inflation and then to reduce too high real interest rates.

In what follows, however, we argue that there is evidence showing that the above
presumption is inconsistent with observations.

First, as discussed in Section 2.1, a downward shift of productivity growth took
place in the early 1990s at the latest, or even earlier. As Figure 2-3 shows, on the other
hand, it was in September 1995 that the BOJ began to guide overnight call rates below
0.5 percent; in February 1999 the BOJ introduced the zero interest rate policy, and in
March 2000 it adopted the aggressive quantity easing. Nominal interest rates were still
far above zero (higher than two hundred basis points) when a largely negative shock
was realized in the early 1990s. In other words, there is at least an interval of half a
decade between the realization of productivity shocks and the introduction of near-zero
interest rate policy.

Hence, it is rather difficult to reconcile this fact with the presumption that the
realization of productivity shocks leads immediately to the binding zero bound. We
would rather hesitate to accept any policy recommendations based on these monetary
models if they could not give any convincing explanations of such a long delay, or the
reason the zero bound slowly and gradually became bound.

Second, the observed term structure of interest rates indicates that the zero bound
of nominal interest rates has never been binding even after the BOJ introduced the zero
interest rate policy. If the zero bound is binding due to permanent or persistent
productivity shocks, not only current nominal interest rates, but also future rates are
expected to reached zero levels immediately after the realization of such productivity shocks. In other words, once negative shocks hit an economy, a yield curve should be immediately flat at zero rates for a wide range of maturity. As Kashyap (2000) rightly comments Bernanke (2000), the observed yield curve has been still upward sloping even after overnight call rates were in the neighborhood of zero rates.

Figures 2-4 and 2-5 illustrate the point. According to Figure 2-4, the term structure of interest rates on certificate deposits has been upward sloping so far. For example, in the year 1999 when the zero interest rate policy was implemented, the one-year-rate was 0.262 percent, and the two-year-rate was 0.417 percent. Thus, the one-year-ahead one-year implied forward rate was 0.572 percent, and this rate is significantly above zero.9 Figure 2-5 shows the same tendency for the term structure of yen swap rates.

What is notable here is not the immediate emergence of flat yield curves after overnight rates reached near-zero levels, but the slow and gradual adjustment to flatter yield curves since then. The latter phenomenon can be interpreted as not constrained behavior as an immediate consequence of the zero bound, but equilibrium behavior reacting to the prospect of further continuation of the zero interest rate policy, as we discuss more thoroughly later in this section.

Third, a price level has been stable or mildly deflationary for the past decade regardless of the choice of indexes during the 1990s (one to two percent deflation in WPI, and fairly slight deflation in CPI, see Table 2-2) contrary to a popular perception of “strong deflationary pressure,” which is partly nourished by arguments of pro-aggressive-monetary-policy proponents. This finding shows that the real interest rate based on market rates is still very low even if market nominal interest rates are close to zero. Together with findings discussed so far, this observation suggests that market real interest rates are equilibrium rates reflecting low productivity growth and scarcity of profitable investment, rather than disequilibrium rates substantially higher than the natural ones.

**Non-Binding Liquidity Constraints**

As Bernanke (2000) argues, the observed level of real interest rates may not be a good measure of financial constraints; firms may be financially constrained even at low real interest rates. As explained earlier, these financial constraints are often pointed

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9 Carefully examining the time-series changes in the term structure of interest rates, Fujiki and Shiratsuka (2001) show that implied forward rates were far above zero for longer than three-month-ahead rates in the period between 1999 and 2000.
out as one probable source of the Japanese stagnation (Iwata, 2001).

It is, however, rather hard to obtain convincing evidence that liquidity constraints are more binding among firms during the 1990s than before. Carefully examining liquidity positions among non-financial corporate sectors, for example, Hayashi and Prescott (2002) find that firms including small ones held enough retention in a form of liquid assets during the 1990s, and that liquid assets played a role as a buffer for corporate financing.

In addition, according to the annual report of corporate accounting compiled by Ministry of Finance, the corporate sector, including manufacturing and non-manufacturing, has been in a financial surplus by the magnitude of around 10 trillion yen since the fiscal year 1998, whereas it used to be constantly in a financial deficit. This also suggests that the firm sector as a whole is unlikely to be subject to liquidity constraints.

As Peek and Rosengren (1997) clearly demonstrate, the lending capacity of Japanese banks deteriorated substantially during the 1990s mainly due to binding risk-based capital requirements associated with a decline in the Japanese stock market. The above findings, however, indicate that such a breakdown of the banking system itself was not likely to cause the failure of firms to exploit profitable investment opportunities.

Ando, Hori, and Saito (2002) find evidence that liquidity constraints, if they ever constrained some manufacturing companies, became weaker and weaker even during the 1990s. Using the data of manufacturing companies listed in the first section of the Tokyo Stock Exchange, they regress the fixed investment relative to physical capital on both the Q ratio approximated by the price-book ratio, and the internal cash flow relative to physical capital. Significant investment sensitivity to cash flow is usually interpreted as evidence for liquidity constraints faced by corporate sectors. According to their estimates (see Figure 2-6), while coefficients on the Q ratios are insignificant as in existing empirical literature, coefficients on cash flow decline toward zero year by year. In addition, they find that firms tended to repay loan and bond using internal cash flow during the second half of the 1990s.

From a long-run perspective, as Ando (2002) emphasizes, one of the most serious problems of corporate finance in Japan was not that cash flow was poor inside firms, but that several institutional constraints kept firms from distributing rich cash flow to stockholders, and eventually to households. However, a gradual improvement has taken place in the 1990s in this respect. For example, the Commercial Law was revised in 1994, and companies were allowed to repurchase their own stocks. This
reform gives us a unique opportunity to assess whether liquidity constraints are binding or not.

Hirose, Yanagawa, and Saito (2002) and others, find that, after the above revision, many cash-rich firms, often financially sound companies, began to refund cash flow to their stockholders through stock repurchases. This phenomenon suggests that good companies were not subject to liquidity constraints, and instead that profitable investment opportunities themselves were scarce even among them.

In conclusion, there is no convincing empirical evidence to justify the claim that too little consumption caused by dynamic inefficiency, too high real interest rates caused by the zero bound of nominal interest rates, or too little investment by widespread liquidity constraints.

The preceding argument is also suggestive for statistical judgment about the current state of the Japanese economy. Estimated negative “output gaps” have been quite often presented as compelling statistical evidence that the Japanese economy was in disequilibrium during the 1990s. For example, Fukao (2001) suggests that the magnitude of output gap was four percent of potential GDP or even larger in the period between the late 1990s and the early 2000s. However, the calculation of output gaps such as the above may be rather misleading. A decline in potential outputs that reflects productivity slowdown in a mildly deflationary environment is likely to yield seemingly negative output gaps when the Phillips curve is estimated based on current and past data.

Moreover, several researches suggest that it is difficult to estimate potential outputs or output gaps precisely, given the unstable Phillips curve relationship in Japan. For example, Hirose and Kamada (2001) show that, among the G7 countries, inflation is least responsive to output gaps in Japan. Then, they demonstrate that the estimated output gap was too volatile to allow for accurate evaluation under such a condition. This suggests possible pitfalls in judging the state of the Japanese economy based on estimated output gaps.

2-5 Summary

The foregoing discussion has suggested the stagnant Japanese economy was not in disequilibrium (or to put it more precisely, constrained equilibrium) caused by zero-nominal-interest-rate constraints and/or other constraints such as liquidity constraints. Rather, though unfortunately, there was substantial evidence that it was in equilibrium or equivalently at the private optimum, for given quantity and quality of
capital (both physical and human) inherited from the past.\textsuperscript{10}

Consequently, any attempts by the government to increase aggregate demand through traditional aggregate demand policy (both fiscal and monetary policy) have been ineffective through familiar Ricardian channels of private economic agents undoing the government’s policies. Being worse, the government intervention has even deteriorated the situation, since the government was proven to be a grossly less efficient spender than private agents. Massive government spending of the Obuchi Government did not succeed in stimulating the economy but resulted in equally massive government debts.

The next section demonstrates that the aggressive monetary policy motivated by such a misleading judgment has yielded undesirable outcomes for the Japanese economy. In particular, on the contrary to its original intention, the implemented monetary policy failed to create inflationary ones and even kindled deflationary ones among market participants.

3. “Policy-Induced” Liquidity Trap

In the previous section, we have shown that the zero bound of nominal interest rates has been binding not as an immediate consequence of the realization of negative productivity shocks, but as a result of aggressive monetary policy culminated in the zero interest rate policy. The way the BOJ implemented its extremely low interest-rate-target policy unfortunately resulted in its long-run commitment to zero nominal interest rates. Because of this commitment, aggressive monetary policy yielded little positive impact on nominal prices, whereas there were many undesirable side effects in financial markets. In this sense, a liquidity trap that the Japanese economy is currently facing is induced by the aggressive monetary policy itself.\textsuperscript{11}

\footnote{Some workers are under-employed or unemployed because their human capital becomes obsolete and its market value becomes zero because of technological change biased against them. Similarly, some capital stocks remain idle since their marginal products cannot cover their costs because of biased technological change. Thus, equilibrium here involves under-utilization and under-employment in the form of “corner-solution” equilibrium.}

\footnote{This statement may be unwarrantably harsh to the BOJ. There is circumstantial evidence that, under heavy misguided political pressures, the BOJ itself was “trapped” in the liquidity trap induced by the zero-interest policy and aggressive quantity easing. See footnote 13.}
As is well known, a liquidity trap is characterized by not the zero bound of nominal interest rates, but extremely strong (possibly infinite) money demand motivated by almost zero opportunity costs of money holdings. While the latter aspect has been frequently ignored in current policy debates on monetary policy, we argue in this section that exactly because of this effect, aggressive monetary policy has yielded unintended non-neutral side effects on not only financial markets, but also the Japanese economy as a whole.

3-1 Impacts of the Zero Interest Rate Policy

In our equilibrium framework, it is not so difficult to understand why aggressive monetary policy conducted by the BOJ so far failed to generate even mild inflation. According to the quantity theory of money, an increase in money supply leads to an increase in price levels given a constant velocity of money. However, since the BOJ guided overnight call rates (inter-bank rates) below 0.5 percent in September 1995, the velocity of money has declined gradually over time. Accordingly, additionally injected money was always circulated quite slowly without having any significant impacts on nominal price levels.

Figure 3-1 depicts the movement of Marshallian $k$ (the ratio of monetary aggregates to nominal aggregate outputs). While Marshallian $k$ for M2+CD shows an upward trend reflecting financial innovations in money markets, the figure displays stability up to 1995 ranging from 25 percent to 30 percent in Marshallian $k$ for M1, which represents monetary aggregates held for a transaction purpose. However, since then Marshallian $k$ for M1 has increased over time and reach to even above 50 percent since the mid-1990s when call rates were controlled below 0.5 percent. This in turn implies that the velocity of the medium of exchange, equivalent to an inverse of Marshallian $k$ for M1, has been reduced substantially year after year (see Figure 3-2).

The reason for this “breakdown” of the quantity theory of money is easily analyzed theoretically on the basis of a standard theory of money demand initially presented by Cagan (1956). Suppose that a demand for a real money balance is characterized as follows:

$$\ln M_t - \ln P_t = \theta \ln Y_t + \frac{1}{\gamma} i_t, \quad (7)$$

where $M_t$ denotes nominal money supply, $\theta$ ($> 0$) and $\gamma$ ($< 0$) implies income
elasticity and an inverse of interest iso-elasticity respectively; the latter indicates that money demand is decreasing in opportunity costs of money holdings. Assume further that, as we argued in Section 2, the equilibrium-based Fisher equation holds so that

\[ r_t = i_t - \left[ (\ln P_{t+1})^e - \ln P_t \right]. \]

where \( r_t \) is an equilibrium real interest rate and \((\ln P_{t+1})^e\) denotes the expectation of the one-period-ahead nominal price level.

Let us normalize the unit of output so as to have \( \ln Y_t = 0 \). Moreover, reflecting a very low equilibrium real interest due to scarcity of profitable investment opportunities, assume that \( r_t = 0 \). Then we get \( i_t = (\ln P_{t+1})^e - \ln P_t \). From this, assuming perfect foresight for analytic simplicity, we obtain the forward-looking path for current nominal prices such as

\[ \ln P_t = -\gamma \sum_{\tau=0}^{\infty} \left[ \frac{1}{1-\gamma} \right] \ln M_{t+\tau}. \]  

(8)

As far as the central bank can commit itself to a permanent increase by \( \Delta \ln M \) in \( \{\ln M_t\}_{t=1}^{\infty} \), then equation (8) immediately leads to

\[ \Delta \ln P_t = \Delta \ln M. \]

In other words, given perfect commitment of the central bank to a plan of current and future money supply, a quantity-theoretic relationship between money and price with constant velocity holds under the zero equilibrium real interest rate, whenever we have \( \gamma < 0 \).

Examining equation (8) more carefully, however, we find that, as money demand becomes more interest-elastic, the current price is less responsive to current and immediate future changes in money supply; if \( \gamma \) is closer to zero, then \( -\gamma \left( \frac{1}{1-\gamma} \right)^\tau \) is smaller (recall that \( \gamma \) is negative). On the other hand, when \( \gamma \) is closer to zero, a
current price is more responsive to changes in money supply of \textit{far future} in a relative sense.

The above property implies that, given limited commitment ability of the central bank, that is, given difficulty of the central bank in committing itself to far-future money supply, quantity-theoretic relationship between money and price (\textit{i.e.} proportionality between current $M_t$ and current $P_t$) is weaker, as money demand becomes more interest-elastic. In this case, current nominal prices do not increase with monetary expansion as much as the case with smaller interest elasticity, and a velocity of money declines accordingly.

In an extreme case where money demand is infinitely interest-elastic ($\gamma = 0$) at zero rates of nominal interest ($i_t = 0$), which is likely since costs of holding money is zero, quantity-theoretic relationship between money and price breaks down completely. To put it more precisely, if $\gamma = 0$, equation (8) cannot be defined any more, and current nominal prices are completely independent of the sequence of current and future $\ln M_t$.

In the above discussion, we have assumed that the equilibrium real interest rate $r_t$ is equal to zero, to simplify our analysis. However, qualitative results are the same if the equilibrium real interest rate is above zero. In fact, this case provides us with an important observation. Consider again the case of infinitely elastic case of $\gamma = 0$. In this case, regardless of money supply plans, the equilibrium-based Fisher equation shows that a mild \textit{deflation} proceeds by the magnitude of the real interest rate $r_t$ at zero rates of nominal interest. Then, as a mild deflation continues with monetary expansion, a velocity of money certainly falls substantially. Nakajima and Polemarchakis (2001) demonstrate that the above equilibrium property characterized as a mild deflation with zero rates of nominal interest is shared among a wide range of monetary models.

The inability of the central bank in influencing prices under zero nominal interest rates is not a matter of mere curiosity. As is often observed, it is difficult for the central bank to commit itself in future plans of money supply. This inability may result in a pathological state of mild deflation with declining velocity of money in spite of aggressive monetary expansion, even if money demand is finitely interest-elastic ($\gamma < 0$), so long as the absolute value of $\gamma$ is sufficiently small. As discussed before, given a limited commitment, almost identical equilibrium properties are obtained when money demand is sufficiently interest-elastic in the neighborhood of zero rates of nominal interest.

Nakashima and Saito (2002) estimate the co-integrating relationship dictated by equation (7) using M1 as monetary aggregates. They find that, while interest elasticity
is rather stable before 1995, money demand became increasingly interest-elastic after the year 1995, reflecting low costs of money holdings under extremely low nominal interest rates. Their statistically significant estimate of interest iso-elasticity (an inverse of $\gamma$, $1/\gamma$) is around –0.04 in the sample period between 1985 and 1994, while its absolute value increases more than fifteen times, ranging from –0.6 to –0.7, in the sample period between 1995 and 2001. While it is hard to obtain precise estimates due to small sample problems, it is quite natural to infer from further declines in the velocity of M1 reported in Figure 3-1 in the early 2000s that the absolute value of interest iso-elasticity was much larger in the early 2000s than in the late 1990s.

The above theoretical argument and empirical evidence jointly demonstrate that a mild deflationary equilibrium with zero rates of nominal interest has emerged since around the year 1995 when the BOJ started to guide call rates below 0.5%. In other words, a quantity-theoretic relationship between money and price has broken down in the neighborhood of zero rates of nominal interest.

The breakdown of the quantity theory of money poses a serious question on the soundness of Japan’s monetary policy. In fact, the particular way that the BOJ implemented the extremely low interest rate policy made it rather difficult for the Japanese economy to take off the liquidity trap we have described so far; in a sense, the liquidity trap was policy-induced.

The BOJ introduced aggressive monetary policy in the form of the zero interest rate policy in April 1999, and the aggressive quantity easing in March 2001. Making these commitments more credible, the BOJ announced that it would continue the zero interest rate policy until a deflationary concern among market participants was wiped out. The BOJ also stated clearly that it would keep the aggressive quantity easing until consumer price indexes started to go up. These aggressive monetary policies were

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12 They find the year 1995 as a statistically significant break point.
13 Circumstantial evidence suggests that the BOJ did not originally intend to introduce those policies as an instrument to promote inflation. In February 1999, the BOJ adopted the zero interest rate policy in order to ease the money markets that were extremely tight toward the intensive March-end (that is, fiscal-year-end) settlement. When the BOJ considered the adoption of the aggressive quantity easing in February and early March 2001, its main concern was again to ease extremely tight money markets. Given strong political pressures, both domestic and abroad, the BOJ was forced to fix those urgent measures on longer-term basis. A similar case was found after September 11, 2001. Immediately after the terrorist attacks in the United States, the BOJ lifted the reserves target from 6 trillion yen to 8 trillion yen in order to mitigate tight money markets. However, after financial turmoil was settled in the United States.
interpreted as the BOJ’s long-term firm commitment to the zero level of nominal interest rates.

It is rather enigmatic that the BOJ used the zero interest rate policy and aggressive quantity easing at the same time as an instrument to stop deflation, since these policies seem to drive the economy exactly in the opposite direction. As it has discussed in detail, any aggressive monetary policy through open market operations that are accompanied by a firm commitment to near-zero interest rates does not result in creating inflationary pressures but it ends up in a pileup of money in money markets with a substantial decline in monetary velocity.

Under the above policy commitment, then, market participants reasonably expect that near-zero interest rates will continue for a rather long period. If the equilibrium real interest rate is low but positive as we argued in Section 2, then the equilibrium-based Fisher equation implies mildly deflationary expectations. As examined in the previous section, the fact that flatter yield curves have emerged recently in financial markets is a strong indication of gradually formed expectations that those aggressive monetary policies will not be repealed any time soon.

Moreover, this aggressive monetary policy resulted in the disproportionate allocation of interest rate risks among financial institutions. Given expectations of a protracted zero-interest-rate regime, investors are willing to purchase the Japanese Government Bonds (hereafter, JGB) without any strong concern about capital losses for at least a few years. In fact, domestically licensed banks have been the most aggressive purchasers of the JGB since expectations of stable low interest rates took root in financial markets around the year 1999.

As shown in Tables 3-1-1 and 3-1-2, the purchases by domestic banks accounted for only 14 percent of net increases in the outstanding JGB (46 trillion yen) between 1997 and 1998, while the share of the public financial institutions such as the postal savings system and the fiscal investment and loan program (denoted as the public fund in the tables) amounted to more than 60 percent. In contrast, the purchase by domestic banks substantially increased to about a half of net increases (equivalent to 71 trillion yen) between 1999 and 2000, while the net position of the public financial institutions and Japan, the BOJ maintained the greatly enhanced target, and even raised it well above 10 trillion yen later. In retrospect, the BOJ itself seemed to be trapped in the current “liquidity trap” under heavy misguided political pressures.

\[14\] In this sense, the liquidity trap observed currently in the Japanese money markets is rather different from that defined originally by Keynes (1936), because in the latter, money is substituted for long-term bond due to expectations of increases in nominal interest rates.
was negative in reflecting the downsizing of these institutions. The BOJ’s share was around one quarter during the same period.

In addition, expectations of continuing low interest rates have substantially reduced an incentive for domestic banks to transfer interest rate risks in financial markets. Domestic banks with rather short maturity of their liability, used to transfer interest rate risks through financial derivatives including interest rate swap, after they purchased a large amount of the JGB. Recently, however, domestic banks have been unlikely to swap fixed rates for float rates; some of them even attempted to speculate on a further decrease in interest rates by exchanging float rates for fixed rates.\(^{15}\)

Such a weak incentive and a speculative motive (more precisely, rather weak demand for float contracts) have reduced swap rates substantially since mid-1999. In normal economic conditions, swap rates are higher than JGB rates by the order of convenience carried by the JGB, given the same currency and maturity; then, swap spreads defined as a difference between swap rates and JGB rates are usually positive. During a financial crisis where a flight to quality emerges, swap spreads are even larger. As Figure 3-3 demonstrates, however, swap spreads have been close to zero or negative since mid-2001. Because JGB rates declined thanks to rather strong demand for the JGB, it follows that swap rates fell faster than JGB rates for the same period.

The above observations suggest that domestic banks carry an extremely large amount of the JGB without hedging interest-rate risks. In other words, interest rate risks are disproportionately allocated to the banking sector. This in turn implicitly creates a considerable interest in stability of interest rates among domestic banks, thereby pressuring the BOJ to continue low interest rates.

### 3-2 “Reflation” Policies and Their Distributional Consequences

As discussed in the previous subsection, as far as the BOJ makes a long-term firm commitment to the zero level of nominal interest rates, quantity-theoretic relationship between money and price breaks down, and accordingly any increase in money supply never leads to an increase in nominal prices. Facing the fact that such aggressive monetary policy based on open market operations has not been successful so far, some

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\(^{15}\) There is also an institutional factor that aggravates this tendency. A tentative accounting rule applicable to only domestic banks, effective up to March 2003, exempts interest rate swap contracts from marking to market. It is often argued that due to this irregular rule, domestic banks are less sensitive to interest rate risks involved in swap contracts.
economists propose much more aggressive policy through money-financing operations. Such monetary policy includes limitless purchase operations of the long-term JGB, direct purchases of the long-term JGB from the government, and even dropping money from a helicopter. These policy measures are identical to one another in that government expenditures are eventually backed by not tax revenues, but newly-issued money.

Most economists agree that such money-financing operations would trigger an increase in nominal prices. Once money-financing operations are implemented, the Ricardian equivalence does not hold any longer. Thus, the central government may exploit seigniorage through money-financing operations for government expenditures, and/or seigniorage may be distributed to households by tax reduction. As discussed by Bernanke (2000) and others, in any case, nominal prices will increase to the extent that a real purchasing power obtained through seigniorage by a central government, households, or other agents is reduced to null.

Although money-financing operations may be regarded as one of the most promising devices for re-inflation, or so-called “reflation,” many popular proposals involving money-financing operations surfaced in policy discussions, except for a few such as those of Ito (2001) and Fukao (2001), are often too heroic and do not seem to be followed by deliberate and detailed discussions about policy procedures and especially possible distributional consequences. We will hereinafter discuss several important issues for money-financing operations, citing several theoretical papers that explore how to escape from a deflationary equilibrium with zero rates of nominal interest.

The first issue is how the central bank is committed to money-financing operations for generating ex-post inflation. The central bank is in general fairly conservative about inflation-promoting policies, and it is not usually as much interested in reducing real government liability as maintaining price stability. In addition, among most developed countries, even the constitution does not allow for outright money-financing operations for the purpose of maintaining fiscal discipline.

Bernanke (2000), Ito (2001), and others thus propose to introduce inflation targeting as a coordination device between the government and the central bank. In their policy framework, the government legally enforces the central bank to keep the

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16 The BOJ has so far made outright purchases of the long-term JGB within the upper limit of net nominal increases in the outstanding BOJ notes.
17 Ireland (2002) argues that the real balance effect under a deflation process as another trigger for increases in nominal prices. He claims that aggregate consumption increases because of an increase in real money balances in the household sector under
level of inflation within a pre-announced range of inflation rates, while the central bank is allowed to apply any kind of monetary operations in order to achieve this target. Eggertsson (2002) theoretically demonstrates that once both the government and the central bank manage to share policy objectives including not only stability of prices and total outputs, but also a reduction of government liability in real terms, then money-financing operations indeed result in the generation of inflation even when an economy is initially liquidity-trapped as a consequence of initial large negative shocks on natural rates. In Eggertsson’s model, a central bank endowed with the above policy objectives obtains means and incentives to money-finance government expenditures to increase both outputs and nominal prices, thereby taking off a liquidity trap.

The second issue concerns a drastic revision in price expectations among market participants due to such money-financing operations. As discussed above, deflationary expectations, though mild, are currently prevailing among markets under the monetary policy framework. With due consideration for prevailing deflationary expectations, any reflation policy, if it were successful, would result in an immediate revision in expectations from deflation to inflation. In other words, such a policy is likely to involve not a gradual change in expectations, but a jump.

Reflecting such a drastic change in expectations, nominal interest rates, both short-term and long-term, are also likely to jump immediately after the credible policy implementation. In this regard, as discussed by Benhabib et al. (2002), the BOJ is obliged to switch a policy regime to a money-growth target letting interest rates determined in money markets, prior to the introduction of money-financing operations. In other words, the BOJ has to cease a long-term commitment to zero rates of nominal interest, thereby allowing for increases in nominal interest. If the BOJ were to attempt to suppress nominal interest increases even after inflationary pressure built up due to money-financing operations, then money would escape massively from money markets and pour into product and asset markets, making impossible to control product as well as asset price inflation. Thus, the lifting of the zero-interest policy is almost inevitable.

In this sense, it would be reasonable to assume that an “accord” between the government and the BOJ includes one-time moderate increases in nominal interest rates deflation, thereby promoting aggregate demand even in a deflationary environment.

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18 There is one caveat on this assessment. In Eggertsson (2002), the zero bound of nominal interest is assumed to be initially binding. In this sense, his setup of the status quo is not consistent with our empirical judgment about the current Japanese economy, which has been explored in Section 2.
in such a reflation policy package, following the spirit of Svensson (2001). Such an interest raise would make it much easier for the BOJ to commit to a money growth target, and to make monetary expansion more credible, because money demand is less interest-elastic at rates of nominal interest taking off from zero.

The argument so far has shown that a reflation package is likely to involve inflation targeting and a lift of the zero-interest rate policy in order to be successful. We now explore the consequences of thus-induced inflation.

If real interest rates were too high relative to equilibrium rates as claimed by those in favor of aggressive monetary policy, then an increase in expected inflation would lower real interest rates and stimulate aggregate demand with little change in nominal interest rates. However, as demonstrated in the previous section, it is much more likely that real interest rates implied by market rates are in fact equilibrium rates. If this is the case, as suggested above, nominal interest rates will shoot up immediately and substantially when market participants are convinced about the government’s intention of money-financing operations and thus rekindle inflationary expectations.

As is well-known, such policy-induced inflation and possible increases in nominal interest rates are likely to yield fairly complicated distributional effects among agents and institutions in an economy. Even without any effect on nominal interest rates, generated inflation would transfer real income from those who hold the JGB to the government. There would be similar income transfer from creditors to debtors among private agents who make contracts in nominal terms.

Even public institutions are not necessarily beneficiaries. For example, the social security account trusts the fiscal loan and investment program (hereafter, FLIP) with funds on a long-term fixed-rate basis, and/or holds the long-term government-guaranteed bond (hereafter, the GGB) on a fixed-rate term. The account, on the other hand, indexes its liability by consumer price indexes. Hence, policy-induced inflation would make this account into deficit. Without any ex-post governmental transfers among agents and institutions, inflation-oriented monetary policy would cause serious conflict between creditors and debtors. This conflict is likely to be aggravated because the reflation policy itself does not enlarge economic pies as a whole when the economy is initially in equilibrium as we explained so far.

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19 A major reason for temporary lifting of the zero interest rate policy in August 2000 was not any intention of a switch of policy regimes from interest-rate target to a money-growth target, but a judgment that Japan’s economy was recovering. This premature judgment about business cycles made by the BOJ triggered bitter policy debates among economists and politicians.
If nominal interests go up, then large-scale transfers emerge even in nominal terms. As pointed out in the previous subsection, domestic banks are currently bearing large interest-rate risks through holding the JGB without hedging. An immediate increase in long-term rates would make these banks suffer from considerable capital losses. The BOJ, who held 73 trillion yen of the JGB as of March 2002, would also incur a large capital loss. Because the liability of the government is not marked to market at all, only those incurred capital losses might be noticeable in appearance.

Again, nominal interest increases impose complicated effects on public institutions such as the social security account (with the asset size of 238 trillion yen as of March 2002), and the postal savings account (with the size of 299 trillion yen). As mentioned above, those public institutions make contracts on a fixed-rate basis by either trusting the FLIP with their funds, or investing in the long-term GGB. Hence, an increase in nominal interest rates would yield large-scale capital losses on their asset sides.

In addition, the postal savings account attaches put options to most of ten-year deposit contracts; these options allow depositors to replace old contracts with lower rates, with new ones with higher interest rates. As Miyazaki and Saito (1999) demonstrate, the effective duration of the liability side becomes extremely shorter as nominal interest rates are higher. Because of these put options, an increase in nominal interest rates would mismatch severely the duration between the asset side and the liability side in the postal savings account.20

What is worse, money-financing operations might send markets an unfortunate signal that the government would intend to back every liability, both outstanding and potential, by not future tax revenues, but newly-issued money. In the past decade, the government was extremely unwilling to establish a firm consensus among tax payers in settling non-performing loans carried by private banks and the FLIP through injecting public money. Given such a deep unwillingness of the government, the BOJ’s money-financing operations would be more likely to be interpreted in the way we describe above among market participants; then, it might trigger a collapse in the JGB market.

Some of aggressive-monetary policy advocates (see Ito 2001 and Fukao 2001)

20 Those in favor of aggressive monetary policy, in particular those outside Japan, seem to be unaware of these potential problems carried by the public institutions in an inflationary environment. These problems are not negligible at all given large scales of these institutions. A few exceptions include Eggertsson (2002) that addresses an issue of the CPI-indexed liability of the social security account.
recognize these distributional problems properly, but they tend to think that such problems can be resolved rather quickly under political leadership. Unfortunately, we are unable to share the same optimism with respect to these problems.

3-3 A Possible Way-Out? : Exchange Rate Policies and Their Feasibility

So far, we have examined unintended side effects of the zero-interest policy to promote economic recovery and possible consequences of the reflation policy to counter current deflationary expectations. The discussion so far has revealed that there is a common problem in these policies: they are not capable of raising equilibrium employment and outputs. As explained in Section 2, the Japanese economy is in equilibrium, though undesirable, and thus these policies are not likely to increase equilibrium employment and outputs. Without increasing equilibrium employment and outputs, distributional problems become keen in the reflation policy and their political fallouts cannot be ignored safely.

There is, however, one aspect of aggregate demand that we have not examined so far: net export. It is possible that through an appropriate policy the government can in fact increase equilibrium employment and outputs by increasing net export through yen depreciation.

The starting point of our analysis is the uncovered interest parity. Suppose that the uncovered interest parity holds as follows:

\[ s_{t+1}^e - s_t = i_t - i_t^* \]  

where \( s_t \) denotes the logarithm of the spot rate of one unit of the foreign currency (dollar) in terms of domestic currency (yen), \( s_{t+1}^e \) is the expected logarithm of spot rates, and \( i_t \) (\( i_t^* \)) is a domestic (foreign) nominal interest rate. We here assume that a foreign nominal interest rate \( i_t^* \) is well above zero.

Assuming the perfect foresight equilibrium for analytic simplicity, we have from equation (9)
\[ s_t = \sum_{\tau=0}^{\infty} (\tau^{s_{t+\tau}} - \tau^{s_{t+\tau}}). \]  

(10)

Equation (10) is a convenient vehicle to examine various policies.

Consider a change in monetary policy. For example, suppose that the BOJ strengthens its commitment to the zero interest policy and makes it clear that it commits to the zero rate of nominal interest for indefinite future at \( t = 0: i_t = 0 \) for \( t \geq 0 \). Then, the current spot rate of yen depreciates immediately as equation (10) indicates, and the spot rate then appreciates over time according to equation (9). In other words, the zero interest rate policy may bring about once and for all depreciation of yen rates and expectations of future appreciation. What is important here is that as far as uncovered interest parity holds, the zero interest rate policy is incompatible with expectations of continuing yen depreciation. Thus, the impact of initial yen depreciation is mitigated by expectations of following appreciation.

Consequently, in order to obtain continuing expectations of yen depreciation and strong impacts on aggregate demand under the uncovered interest parity, the BOJ is here again obliged to cease a commitment to the zero level of nominal interest rates, allowing for an increase in interest rates. As equation (10) implies, however, an increase in nominal interest rates directly leads to appreciation of current yen rates, not depreciation. In order to have immediate depreciation as well as depreciation expectations, hence, the BOJ has to resort to other policy procedures in addition to a raise in nominal interest rates. Svensson (2001), for example, proposes a policy package, consisting of lifting zero interest rate commitment, a price-level targeting, a devaluation of domestic currency, and a temporary exchange rate peg, for the purpose of generating expectations of both depreciation and inflation.

In current policy debates, depreciation of yen currency has been regarded as one of the most promising routes in which the Japanese economy can recover from both recession and deflation. However, the preceding theoretical argument indicates that, so long as the uncovered interest parity holds, the yen-depreciation policy is not as easy as it seems. The initial impact of immediate yen depreciation is likely to be offset to a substantial degree by following gradual appreciation. A complicated scheme such as Svensson’s is needed to take advantage of lasting effects of yen depreciation.

In the preceding analysis, we have assumed that the uncovered interest parity condition holds all the time. However, there are a couple of theoretical cases in which the uncovered interest parity does not hold at least in the short run. Abundant empirical evidence also indicates that the uncovered interest parity is unlikely to hold.
for most pairs of foreign exchanges at least in the short run, and such evidence is often called the forward discount anomaly.\textsuperscript{21} If this is the case in the current state of the Japanese economy, exchange rate policies become more promising than otherwise. We now consider these cases.

One possible case of deviation from the uncovered interest parity involves portfolio adjustment costs or often-called liquidity effects. Because of time and costs involved in adjusting cash positions, a tight relationship may break down between current nominal interest rates and expected inflation. Consequently a one-to-one correspondence between current nominal interest rates and changes in future exchange rates may also break down in the uncovered interest parity condition at least in the short run after changes in monetary policy.\textsuperscript{22} For example, monetary expansion may lower domestic nominal interest rates through liquidity effects, but domestic currency is expected to depreciate as a result of inflation effects. Accordingly, expectations of depreciation may prevail even under lower current rates of domestic nominal interest.

Thus, if these portfolio adjustment effects or liquidity effects are strong enough, depreciation-induced changes in monetary policy may result in gradual depreciation in the short run. However, this effect is only short-lived: the uncovered interest parity prevails after portfolio adjustment is completed and appreciation eventually follows. The length of the adjustment period is hard to be estimated but one expects that it is not years but at most a few quarters.

Another possible deviation from the uncovered interest parity is the effect of model uncertainty or Knightian uncertainty (which is also called ambiguity). In the argument based on the uncovered interest parity, we have assumed perfect foresight. However, in reality, perfect foresight and its stochastic counterpart, rational (model-consistent) expectations, may not be good representation of market participants’ expectations, especially in such volatile markets as foreign exchange markets. In other words, market participants of foreign exchange markets may face severe model uncertainty or Knightian uncertainty in the sense that they are left to the multitude of possible models of market dynamics.

As most Japanese market participants are risk averse, it is likely that they are also model-uncertainty averse or Knightian-uncertainty averse.\textsuperscript{23} This implies that the

\textsuperscript{21} See Engel (1996) for an empirical survey of the forward discount anomaly.
\textsuperscript{22} Fukuta and Saito (2002) propose such a theory and examine implications empirically using foreign exchange data.
\textsuperscript{23} Axiomatic foundation of (Knightian-) uncertainty aversion is given in Gilboa and Schmeidler (1989). See also Nishimura and Ozaki (2001) and references therein for
uncovered interest parity condition (9) is replaced by

\[ s'_{t+1} - s_t = i_t - (i_t' - \phi_t), \]

(11)

where \( \phi_t \) denotes the Knightian-uncertainty premium that Japanese investors require on foreign-currency denominated assets.\(^{24}\)

A new policy inducing yen depreciation may increase model uncertainty or Knightian uncertainty of Japanese market participants and thus may increase the Knightian-uncertainty premium \( \phi_t \).\(^{25}\) Then, gradual depreciation over periods becomes possible instead of sharp, instantaneous depreciation followed by gradual appreciation. In this way, a combination of (a) gradual yen depreciation, (b) output increase through an increase in net export, and (c) inflation through increased demand and increased imported prices, becomes possible for a prolonged period, depending on the magnitude of the Knightian-uncertainty premium and its dynamic evolution.

The foregoing discussion suggests that exchange rate policies may be a way out from the stagnation and deflation that the Japanese economy faces. The plausibility of the above scenario is of course based on the presence and the magnitude of model uncertainty or the Knightian uncertainty, of which we unfortunately do not have any reliable information. Moreover, it is not clear that deliberate depreciation policies of this kind is acceptable for trading partners of the Japanese economy, especially the United States and East Asian countries. Only a strong political leadership of the Japanese Government may achieve a consensus among trading partners about the implementation of such depreciation policies. The prospect of such leadership is, as of this writing, unfortunately slim.

### 3-4 Summary

In this section, we have argued that the aggressive monetary policy so far the effect of Knightian uncertainty in a dynamic setting.

\(^{24}\) As Engel (1996) and others survey, existing empirical evidence strongly rejects a risk premium term in characterizing \( \phi_t \). Alternatives to the Knightian-uncertainty premium and the liquidity effect explored in this section include irrational expectations, speculative bubbles, and peso problems.

\(^{25}\) Nishimura and Ozaki (2002) show that the Knightian-uncertainty premium increases over period when model-uncertainty or Knightian uncertainty is truly dynamic. This effect further strengthens the argument for gradual depreciation in the text.
implemented is dubious in theory and harmful in practice for not only financial markets but also the economy as a whole. We have stressed that the view that the mildly deflationary environment is disequilibrium (or more precisely speaking, constrained equilibrium with zero bounds of nominal interest rates and/or liquidity constraints) is not supported by available data. We have characterized the current state of the Japanese economy as a deflationary equilibrium with policy-induced zero rates of nominal interest. Then, it is easy to understand that to rekindle inflation by exploring every possible measure is likely to upset prevailing expectations among market participants currently, and thus to risk smooth functioning of the economy by possible large-scale implicit and explicit wealth transfers among economic agents, with little effects on employment and outputs.

Besides the above distributional repercussion, the success of reflation policies with money-financing operations would hinge on deliberate policy procedures, including implementation of inflation targeting as a commitment and coordination device for the government and the BOJ, suspension of a long-run commitment to zero rates of nominal interest, a careful regime switch from an interest rate feedback rule to a money growth rate target, credible and articulate announcement of the government and the BOJ to coordinate expectations among market participants, and so on.26

Unfortunately, except for a few exceptions, proponents of aggressive monetary policy advocate inflation targeting and pay little attention to the above-mentioned implementation and consequential issues. Without these careful and precautionary measures, mild inflation would not be obtainable as an equilibrium consequence. Policy operations and procedures ignoring these issues might fail to improve or even worsen the state of the economy.

We have also examined exchange rate policies. We have shown that exchange rate policies may be a way-out from current policy deadlocks and may be capable of producing continuing yen depreciation, increasing employment and outputs, and mild inflation through increased demand and higher imported prices, if there are substantial portfolio adjustment costs and/or Japanese market participants see substantial model uncertainty or Knightian uncertainty in foreign exchange markets. However, the magnitude of these costs and uncertainty is not known and moreover, political feasibility of such a seemingly beggar-thy-neighbor policy is at best uncertain.

26 On the other side of the same coin, we agree to reflation policies if these precautionary measures are taken and distributional issues are properly solved by appropriate policies. However, we doubt their feasibility in the current political conditions.
Given the above premature conditions surrounding reflation policies through money-financing operations and exchange rate policies, we believe the government should shift emphasis appropriately from traditional aggregate demand management to a policy directly tackling the core of problems that the Japanese economy faces, that is, scarcity of profitable investment opportunities. As Fukao (2001) emphasizes it forcefully, the current deflation puts a tremendous pressure on financial soundness of the government, pension systems and other financial systems. However, we should stem such deflationary pressure by a policy to create new demand for goods and services. This will clearly set desirable pre-conditions for reflation policies and exchange rate policies by increasing outputs and employment and thus by reducing undesirable distributional and international effects. We now turn to this kind of policy in the next section.

4. Toward the Social Optimum: A Proposal

In Section 2, we have argued that the Japanese economy had been largely in equilibrium and at the private optimum during the 1990s and early 2000s. We have pointed out that productivity slowdown and scarcity of profitable private investment opportunities were fundamental causes of the prolonged Japanese stagnation. In Section 3, we have demonstrated that massive and extremely aggressive monetary policy, seemingly misguided by the belief that the Japanese economy was constrained by zero-nominal interest bounds and/or liquidity or other artificial constraints, have made an artificial liquidity trap and resulted in unintended deflationary expectations, instead of inflationary ones.

Although our analysis sounds very pessimistic in that proposed aggregate demand policy is ineffective at best, we are in fact no pessimists: in this section we propose a scheme to revitalize the Japanese economy in a policy different from aggregate demand management. It should be noted that we have carefully put an adjective “private” to the “optimum” when we have described the Japanese economy being in the private optimum. We think that the Japanese economy is far from the social optimum with respect to the quality of capital stocks, and there are ample investment opportunities of decent social returns.
4-1 Divergence Between Private and Social Returns on Capital Stocks

In particular, we argue that there are many socially desirable investment opportunities in Japan, but they are not undertaken because their private returns are so small or in some cases even negative to induce private agents to invest.

As a densely populated, developed, and matured economy, there are many environmental problems in Japan such as air, water and soil pollution, threatened water supply, excessive dependence on foreign fossil fuel sources, vulnerability to disasters like earthquakes, deteriorating urban weather conditions often called “heat-island” phenomena, and congested unpleasant living conditions in some parts of cities, to name a few. This means that many of privately-held capital stocks, both industrial (plants and equipments) and residential (buildings and houses), have various intertwined technical externalities that are difficult to be internalized in the market place.

Technical Externalities Among Capital Stocks in Many Investment Areas

The technical externalities described above suggest that socially desirable but privately unprofitable investment opportunities are found and quantitatively significant in many investment areas in Japan. Among them, we examine two important investment areas that are hit particularly severely by economic slumps of the 1990s and early 2000s: investment opportunities related to the construction industry and those related to manufacturing industries. In 2000, the construction industry’s share in GDP was around 7% and the GDP share of manufacturing industries was 23%. The construction industry hired almost 10% of all workers while manufacturing industries employed 18%. Moreover, residential construction and manufacturing investment are two pillars of total investment in Japan as in other countries27.

Let us now consider investment opportunities related to the construction industry. A typical case is found residential capital stocks. In a recent study, Asami and Gao (2002) show that to convert one residential lot to a small park (often called “pocket park”) in a densely settled area increases the value of surrounding lots significantly in Tokyo. However, there is no private incentive for conversion, since the proceeds of the conversion accrue to owners of surrounding lots and not to the owner of this particular lot. This is only one example of practical difficulty in urban redevelopment

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27 Construction and manufacturing industries are also industries where technological progress is biased against human capital of workers employed there. Thus, to encourage investment to utilize their human capital is important with respect to tackling under-employment there.
in Japan caused by externality of privately owned residential stocks. Although a social rate of return from new capital stocks (urban redevelopment) is high, nobody wants to invest their own money individually since its private return is low or non-existent\textsuperscript{28}.

It should be noted here that a strong positive externality is present in this pocket-park example among residential capital stocks. New investment in one type of residential stocks increases marginal productivity of other types of residential stocks. Thus, this socially desirable but privately unprofitable investment is likely to trigger new investment in other privately owned capital stocks.

Similar examples are easily found in industrial capital stocks in manufacturing industries. Take solar cells (or other alternative environmentally-friendly energy resources). The use of solar cells evidently contributes to reducing air pollution and over-dependence on dwindling sources of foreign fossil-fuel energy resources. However, such externality benefits do not accrue to the owners of solar cells since there are no markets for these benefits. Thus, considering high costs of solar cells, most users hesitate to adopt them as their major energy resources.

Other examples include recycling facilities of various kinds. It is socially desirable to have recycling facilities of industrial waste but they are in many cases privately unprofitable, except for a few cases. A subtler example is to scrap old facilities that pollute environment and to build new facilities that are environment-friendly. Usually, such scrap and build involve substantial costs but relatively little productivity gains. Profit-oriented private firms thus shun such investment, though they are socially desirable especially in a densely populated country such as Japan.

The divergence between social and private returns is not confined in tangible stocks. It also happens in intangible assets like patents and know-hows, as the following anecdote shows. An engineer in one of leading opto-electronics companies in Japan came up with an idea that the technology used to produce photo-sensitive products could be used to manufacture robots to sense and then sweep mines some time ago. However, after several tense business meetings, the management abandoned the project of the mine-sweeping robots since its private return was so slim to satisfy stockholders.

\textsuperscript{28} Urban re-development and other related projects involve much human capital in coordinating interest groups and so on. As of January 2002, this type of human capital is left idle outside and inside financially distressed construction companies.
Governmental Provision Versus Private Initiatives

As we all know, the social return must be equal to the real interest rate at the social optimum, but a non-negligible discrepancy between social and private returns shows that the private return is too low there. Thus no private agent ever undertakes such a project, and the economy ends up in a social sub-optimum. The discussion so far indicates that such social sub-optimum is not an exception but a rule in the present-day Japan.

One conceivable way to alleviate this discrepancy is, of course, Pigovian subsidies by the government. However, for two reasons we should rather avoid pursuing this route, in addition to apparent difficulty to calculate appropriate subsidies for each capital stock. One is a huge budget deficit of the Japanese government, and the other is inability of public sector efficiently enforcing such subsidies. In fact, the government has instituted a kind of Pigovian subsidies for solar cells, but it has been proven to be not very much successful.

Thus, the real challenge of the Japanese economy is to find a practical way to encourage such socially desirable but privately unprofitable investment, not relying on the government.

We thus should emphasize here that the existence of socially desirable but privately unprofitable investment opportunities does not at all mean that the government should spend money to “social infrastructure” such as roads, bridges, airports and public buildings, since there is ample evidence that the social rate of return on such “infrastructure” itself is very low and in some cases negative if we properly take maintenance costs into consideration. Nor we recommend the government to choose some environment-friendly capital stocks and to promote them by taxes and incentives. Over almost twelve years of stagnation, the government has unfortunately proven itself to be unadept in this regard. Private initiatives are far better than the government’s ones that are plagued with influences of vested interest groups.

4-2 A Scheme to Induce Socially Desirable But Privately Unprofitable Investment

There are, then, two fundamental problems in promoting socially desirable but privately unprofitable investment, under private initiatives. Firstly, we have to devise a system to funnel private funds to these socially desirable but privately unprofitable investment. Second, there should be efficient selection mechanism to determine which projects should be carried out among various candidate investment projects.
We propose here a scheme that solves these problems simultaneously. In this scheme, Socially-Oriented Investment Trusts play a crucial role.

**Socially-Oriented Investment Trusts (SOITs)**

Socially-Oriented Investment Trusts, hereafter called as SOITs, are investment trusts that purchase socially desirable but privately unprofitable (tangible or intangible) capital stocks, lease them to firms and households, get rental revenues, and pay proceeds net of operating costs to their shareholders as dividends. They are like Real Estate Investment Trusts (REITs), but they invest not in privately profitable real estates but socially desirable but privately unprofitable (tangible and intangible) capital stocks.

Like REITs, outstanding shares of these SOITs should be traded in a public exchange such as Tokyo Stock Exchange. Outstanding shares of SOITs are no different from shares of ordinary REITs. They are priced in the same way as REITs: their share is a per-share claim of future net cash flows from their socially desirable but privately unprofitable capital stocks. Thus, the basic legal framework of REITs can effectively be applied to SOITs, thus minimizing time and cost of introducing the new scheme.

There is, however, a problem of how to start SOITs in the first place. Since SOITs invest in socially desirable but privately unprofitable capital stocks, the market value of SOITs, which is the value of future dividends from these capital stocks, are not likely to be sufficiently greater than the initial cost of purchasing these capital stocks. In more likely cases, the market value may be smaller than the initial cost. In other words, initial investors in SOITs, whose money is used to purchase their capital stocks, may suffer capital losses immediately after SOITs’ shares are traded in the exchange. No private investors are likely to purchase initial offering of shares of SOITs. We need a system that induces some investors to purchase initial offering of SOIT shares to make SOITs viable.

We propose a system of tax-surcharges with 100 percent-plus tax credits specially designed for this purpose, which might be called “socially-oriented tax surcharges.”

**Socially-Oriented Tax Surcharges (with Tax Credit of 100 percent-plus SOIT**

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29 As of this writing (January 2003), there are only six REITs listed in the Tokyo Stock Exchange. The barrier for a REIT to be listed and traded in the Tokyo Stock Exchange seems too high to be justified. Institutional rigidities are often cited for causing this barrier. We expect comparable problems in the case of SOITs. In order to have a well-functioned SOIT market, these institutional rigidities should be cleared as soon as
Investment Initial Capital Losses)

In this scheme, tax surcharges are levied on households with high income-brackets. However, the households can deduct \((100 + \alpha)\) percent of initial capital losses from their overall tax payment if they purchase initial offering of SOITs and incur capital losses. (The exact value of \(\alpha\) is determined to be sufficient to induce these households to purchase initial offering of SOITs).

Under this tax system, high-income households are virtually asked to choose whether to invest their money into increments in socially desirable but privately unprofitable capital stocks (through purchasing initial share offers of new SOITs) or to pay tax surcharges outright to the government. Most of the high-income households are likely to invest their money in initial offering of new SOITs, since they can deduct more than 100 percent of resulting capital losses from their tax payment. This leaves them financially better off than paying the tax surcharge. Thus, this scheme induces a flow of private savings to socially desirable but privately unprofitable investment.

Independent Rating Agencies of Assessing Social Rate of Returns on SOITs

So far we have argued that SOITs are natural vehicles of carrying out socially desirable but privately unprofitable investment, and have discussed the way SOITs are initially financed. The remaining problem is how we select SOITs to guarantee that only socially desirable ones are undertaken.

In this respect, it is important to require that all new SOITs should be examined by independent SOIT-“rating” agencies and only those should be allowed to be financed that at least two of these agencies agree that their social rate of return equals or exceeds the market rate. Otherwise, projects yielding only private returns might disguise themselves as SOITs to get cheap finance, and projects having only marginal social returns mislead households to invest in them.

In many cases, to assess social rates of returns is not as difficult as one might think.

\[30\] A necessary part of this scheme is tax credits on initial capital losses on SOITs, and tax surcharges on high-income-bracket tax payers are one possible way to finance tax credits. Equally possible is the issuance of “government bonds for socially oriented investment.” We choose tax surcharges here since we think this is a socially fair scheme in the midst of regressive tax reforms that are proposed so far and are about to be implemented in Japan.

\[31\] There are other economic and legal issues we cannot touch upon here. Some of them are discussed in the proposal of Forum of Policy Initiatives (2002), of which the second author is a principal writer.
A similar framework is adopted in the CO2 emission reduction plan that has been accepted by the Kyoto Protocol. The scheme called the Clean Development Mechanism (CDM) is the project that is implemented to reduce CO2 emission in developing countries by private firms operating in developed countries, and those firms are allowed to receive the CO2 emission credits that are transferable to their home countries. In this framework, independent agencies assess how much CO2 will be reduced by a CDM project, and accordingly qualify how many emission credits are available from this project. The role of these independent agencies is basically to assess the social rate of returns through positive externality on CDM projects.\textsuperscript{32}

Third-party rating agencies are not necessarily public institutions. Given a proper governance mechanism such as licensing, guidelines, and competition among agencies, independent agencies may be private firms or non-profit organizations. In the case of CDM, independent agencies are indeed private.

In some cases, we may employ a “Sage” approach in which we “elect” some knowledgeable, respectable persons to a Committee of Sages, and trust in their judgment.

One of the most distinctive benefits of the above scheme is that it has a mechanism to allocate funds more efficiently to socially desirable but privately unprofitable investment. There are private incentives to do so. Thus, this shows that it is possible and desirable to use a market mechanism (supported by a tax system) to attain social efficiency with respect to socially desirable but privately unprofitable investment.

\section*{5. Concluding Remarks}

In this paper, we have identified productivity slowdown and scarcity of profitable private investment opportunities starting in the early 1990s or even earlier as a fundamental cause of the prolonged Japanese stagnation during the 1990s and early 2000s. We then have argued that the Japanese economy has been largely in equilibrium although it is a socially undesirable state. This is contrary to a popular view that the Japanese economy is in “disequilibrium,” constrained by zero nominal interest bounds and/or widespread liquidity constraints.

Once we notice that the current Japanese economy is in equilibrium, it is almost

\textsuperscript{32} Here we do not give any assessment with respect to whether CDM is successful or failure. We only point out that assessment of social returns are possible by private agencies as exemplified in CDM schemes.
straightforward to understand why aggressive fiscal and monetary policy implemented so far failed to pump up the economy. Moreover, we have argued that aggressive monetary policy intended to raise expected inflation, ironically encourages deflationary expectations among market participants and thus caused a policy-induced “liquidity trap.” In addition, we have pointed out that even more aggressive policy such as money-financing of government expenditures proposed by some proponents of aggressive monetary policy may have severe distributional consequences without little effect on outputs and employment though they may be able to rekindle inflation. Exchange rate policies have shown to be promising at least in the short run, but international repercussion may limit their political feasibility. Consequently, we need a new policy scheme (possibly coupled with carefully designed variants of the above two policies) that directly tackles the core problem of the Japanese economy and increases outputs and employment.

We have argued that the major cause of the current stagnation is scarcity of profitable private investment partly caused by technological change biased against the past strength of the Japanese economy. Thus, any policy to revitalize the Japanese economy should squarely solve this issue. We then have stressed that the present equilibrium is not the social optimum. There are many socially desirable investment opportunities but they are not undertaken because their private returns are so small or in some cases even negative to induce private agents to invest. Thus, a real challenge of the Japanese economy is to encourage such socially desirable but privately unprofitable investment. To this end, we have proposed a package of Socially-Oriented Investment Trusts and Socially-Oriented Tax Surchages.

Admittedly, any new scheme is not easy to be implemented, and our proposal is no exception. However, the twelve-year history of extraordinary but ineffective aggregate demand policy seems to point us that the Japanese stagnation is not likely to be solved by yet another massive aggregate demand policy. Nor can simple “structural reforms” without clear understanding of the heart of the stagnation, that is, productivity slowdown and scarcity of profitable private investment opportunities.
References


Table 2-1: Net Returns on Capital, from 1980 to 1999

<table>
<thead>
<tr>
<th>Year</th>
<th>Before-tax net returns among the entire industries (1990 prices, trillion yen)</th>
<th>Physical stocks held by all private corporations (1990 prices, trillion yen)</th>
<th>Net returns on gross stocks (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>20,990</td>
<td>272,022</td>
<td>7.72</td>
</tr>
<tr>
<td>1985</td>
<td>23,182</td>
<td>393,555</td>
<td>5.89</td>
</tr>
<tr>
<td>1990</td>
<td>40,996</td>
<td>574,600</td>
<td>7.13</td>
</tr>
<tr>
<td>1995</td>
<td>24,835</td>
<td>759,806</td>
<td>3.27</td>
</tr>
<tr>
<td>1999</td>
<td>13,609</td>
<td>914,895</td>
<td>1.49</td>
</tr>
</tbody>
</table>

Note:

(1) Before-tax net returns (the second column) are based on the calculation of Financial Research Center, Nomura Securities. Those returns include both rents on land and excess profits (monopoly rents) due to imperfect competition; consequently, they are upward biased.

(2) Physical stocks (the third column) are based on *Private Corporate Capital* compiled by the Cabinet Office, the Government of Japan. Depreciations on those stocks are calculated by not an economic basis, but an accounting basis; accordingly, the evaluation of stocks is upward biased.
<table>
<thead>
<tr>
<th></th>
<th>GDP deflator</th>
<th>WPI Index</th>
<th>CPI Index</th>
<th>WPI rate (%)</th>
<th>CPI rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>83.5</td>
<td>106.6</td>
<td>83.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>85.2</td>
<td>105.9</td>
<td>-0.7</td>
<td>85.5</td>
<td>1.8</td>
</tr>
<tr>
<td>1984</td>
<td>87.6</td>
<td>106.2</td>
<td>0.3</td>
<td>87.3</td>
<td>2.2</td>
</tr>
<tr>
<td>1985</td>
<td>89.6</td>
<td>104.4</td>
<td>-1.7</td>
<td>89.1</td>
<td>2.0</td>
</tr>
<tr>
<td>1986</td>
<td>90.8</td>
<td>99.0</td>
<td>-5.2</td>
<td>89.1</td>
<td>0.0</td>
</tr>
<tr>
<td>1987</td>
<td>90.6</td>
<td>97.3</td>
<td>-1.7</td>
<td>89.5</td>
<td>0.5</td>
</tr>
<tr>
<td>1988</td>
<td>91.3</td>
<td>96.7</td>
<td>-0.6</td>
<td>90.2</td>
<td>0.8</td>
</tr>
<tr>
<td>1989</td>
<td>93.6</td>
<td>99.3</td>
<td>2.7</td>
<td>92.9</td>
<td>2.9</td>
</tr>
<tr>
<td>1990</td>
<td>95.9</td>
<td>100.6</td>
<td>1.3</td>
<td>95.7</td>
<td>3.1</td>
</tr>
<tr>
<td>1991</td>
<td>98.5</td>
<td>101.0</td>
<td>0.4</td>
<td>98.4</td>
<td>2.8</td>
</tr>
<tr>
<td>1992</td>
<td>100.0</td>
<td>100.0</td>
<td>-1.0</td>
<td>100.0</td>
<td>1.6</td>
</tr>
<tr>
<td>1993</td>
<td>100.4</td>
<td>98.2</td>
<td>-1.8</td>
<td>101.3</td>
<td>1.3</td>
</tr>
<tr>
<td>1994</td>
<td>100.3</td>
<td>96.8</td>
<td>-1.4</td>
<td>101.7</td>
<td>0.4</td>
</tr>
<tr>
<td>1995</td>
<td>99.8</td>
<td>95.9</td>
<td>-1.0</td>
<td>101.4</td>
<td>-0.3</td>
</tr>
<tr>
<td>1996</td>
<td>99.1</td>
<td>94.4</td>
<td>-1.5</td>
<td>101.8</td>
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</tr>
<tr>
<td>1997</td>
<td>99.8</td>
<td>95.4</td>
<td>1.0</td>
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<td>2.0</td>
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<tr>
<td>1998</td>
<td>99.2</td>
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<td>92.5</td>
<td>-0.8</td>
<td>103.5</td>
<td>-0.5</td>
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<td>2000</td>
<td>95.8</td>
<td>92.4</td>
<td>-0.1</td>
<td>102.9</td>
<td>-0.6</td>
</tr>
<tr>
<td>2001</td>
<td>94.6</td>
<td>91.4</td>
<td>-1.1</td>
<td>101.9</td>
<td>-1.0</td>
</tr>
</tbody>
</table>
### Table 3-1-1: Who holds the Japanese Government Bond?  
(March 1996 -- March 1998, 100 million yen)

<table>
<thead>
<tr>
<th></th>
<th>Outstanding</th>
<th>Bank of Japan</th>
<th>Domestic Banks</th>
<th>Trust Funds</th>
<th>Insurance</th>
<th>Postal Savings</th>
<th>Public Funds</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>March, 1996</strong></td>
<td>2279753</td>
<td>177768 (7.8%)</td>
<td>269688 (11.8%)</td>
<td>241761 (10.6%)</td>
<td>304056 (13.3%)</td>
<td>226147 (9.9%)</td>
<td>601624 (26.4%)</td>
<td>36597 (1.6%)</td>
</tr>
<tr>
<td><strong>Changes in two years</strong></td>
<td>459317</td>
<td>63611 (13.8%)</td>
<td>63306 (13.8%)</td>
<td>9383 (2.0%)</td>
<td>25401 (5.5%)</td>
<td>94003 (20.5%)</td>
<td>184457 (40.2%)</td>
<td>14320 (3.1%)</td>
</tr>
<tr>
<td><strong>March, 1998</strong></td>
<td>2739070</td>
<td>241379 (8.8%)</td>
<td>332994 (12.2%)</td>
<td>251144 (9.2%)</td>
<td>329457 (12.0%)</td>
<td>320150 (11.7%)</td>
<td>786081 (28.7%)</td>
<td>50917 (1.9%)</td>
</tr>
</tbody>
</table>

### Table 3-1-2: Who holds the Japanese Government Bond?  
(March 1999 -- March 2001, 100 million yen)

<table>
<thead>
<tr>
<th></th>
<th>Outstanding</th>
<th>Bank of Japan</th>
<th>Domestic Banks</th>
<th>Insurance/Pension</th>
<th>Mutual Funds</th>
<th>Social Security</th>
<th>Postal Savings</th>
<th>Public Funds</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>March, 1999</strong></td>
<td>3455586</td>
<td>316982 (9.2%)</td>
<td>284423 (8.2%)</td>
<td>645100 (18.7%)</td>
<td>40107 (1.2%)</td>
<td>103661 (3.0%)</td>
<td>285578 (8.3%)</td>
<td>998232 (28.9%)</td>
<td>68543 (2.0%)</td>
</tr>
<tr>
<td><strong>Changes in two years</strong></td>
<td>705088</td>
<td>170778 (24.2%)</td>
<td>341722 (48.5%)</td>
<td>180273 (25.6%)</td>
<td>79853 (11.3%)</td>
<td>5597 (0.8%)</td>
<td>-10250 (-1.5%)</td>
<td>-225573 (-32.0%)</td>
<td>37373 (5.3%)</td>
</tr>
<tr>
<td><strong>March, 2001</strong></td>
<td>4160674</td>
<td>487760 (11.7%)</td>
<td>626145 (15.0%)</td>
<td>825373 (19.8%)</td>
<td>119960 (2.9%)</td>
<td>109258 (2.6%)</td>
<td>275328 (6.6%)</td>
<td>772659 (18.6%)</td>
<td>105916 (2.5%)</td>
</tr>
</tbody>
</table>
Figure 2-1

Technological Progress and ICT Ratio

Source: Nishimura and Shirai (2002), Figure 2.
Figure 2-2

Returns on Equity (ROE): Nomura 400 (Excluding Financial)

Notes: Nomura 400 is a stock index designed to serve as a benchmark for the performance of the Japanese equity market. The market value of stocks included in the index is roughly 70% of the market value of stocks listed in the first section of the Tokyo Stock Exchange. Source: Financial Research Center, Nomura Securities.
Figure 2-3

Overnight Call Rates:

Annual up to 1996, Monthly from January, 1997
Figure 2-4

Term Structure of Interest Rates
on Certificates of Deposits (annual, %)
Figure 2-5

Term Structure of Yen Swap Rates (annual, %)
Figure 2-6

Sensitivity of Cash Flow in Investment Equations:
Manufacturing Companies Listed in the First Section
of the Tokyo Stock Exchange

Figure 3-1
Marshallian $k$ for M2 + CD and M1
Annual up to 1997, Quarterly from 1998/I
Figure 3-2

Velocity of M1 (an Inverse of Marshallian k)

annual up to 1997, quarterly from 1998/I
Figure 3-3

Yen Swap Spreads (Ten Year Maturity)

Annual up to 1997, Monthly from March, 1998