〔論　　　文〕

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Macroeconomics of Weak Corporate Governance: An Alternative Theory of Japan's Lost Decade*

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1 Introduction

The prolonged stagnation of the Japanese economy since the early 1990s has posed a serious challenge to the conventional wisdom about business cycles and macroeconomic policies. Keynesian demand-deficiency theories could address short-term slumps but lack satisfactory explanations for the decade-long slump and the incompetence of both monetary and fiscal policies in promoting economic recovery.1) Meanwhile, supply-side theories could address chronic slumps in terms of the decline in the potential growth rate but lack satisfactory explanations for the persistent deflation under the massive injections of liquidity by the central bank.

To overcome these limitations of the conventional theories, this paper offers an alternative interpretation of Japan's lost decade based on a dynamic macroeconomic model with optimizing agents. In presenting the alternative interpretation, I focus on the following five facts of Japan's stagnation. The first fact is a substantial fall in income growth (see Figure 1 for the growth rate of real national income). The growth rate of real national income fell from about 5% per annum to near zero in the early 1990s and has fluctuated around 0% since the mid-1990s.

The second fact is a substantial rise in the Marshallian k (see Figure 2 for the ratio of M1 to national income). The Marshallian k was quite stable until the 1980s, but began to increase in 1990 and has shown a sharp increase since the mid-1990s.2) This fact suggests that, during the 1990s and the 2000s, Japanese households changed the composition of their savings. That is, they flee from capital investments to money holdings in their portfolios.3)

The third fact is a substantial rise in consumption propensity (see Figure 3 for the ratio of private

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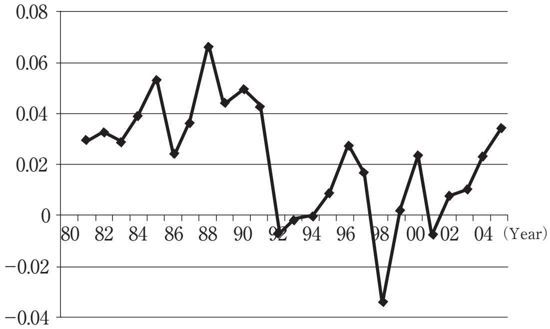
1) The theory of liquidity trap could explain the ineffectiveness of monetary policies in stimulating recovery. However, what is sometimes ignored by recent Keynesians is the fact that, under the Keynesian liquidity trap scenario, fiscal policies should have maximum effectiveness.

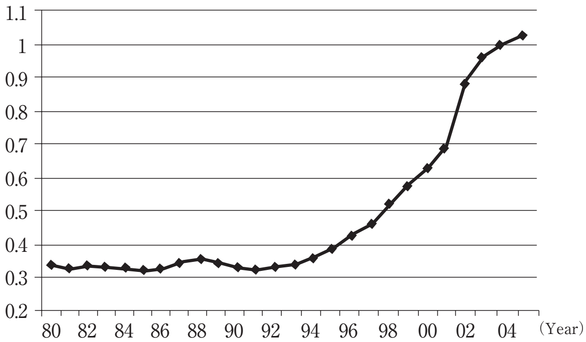
2) I depict the movement of the Marshallian k associated with M1. The Marshallian k, defined by the ratio of M2+CDs to national income, similarly displays an upward trend, while its movement is more moderate.

Figure 1 Growth rate of real national income



Sources: Annual Report on National Accounts, Cabinet Office, Government of Japan.

Figure 2 Marshallian k (the ratio of M1 to national income)



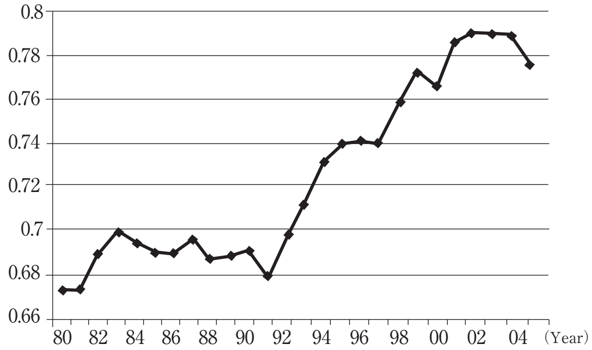
Sources: Annual Report on National Accounts, Cabinet Office, Government of Japan; Financial and Economic Statistics Monthly, Bank of Japan.

consumption to national income). The consumption propensity was also relatively stable until the 1980s, but began to increase in 1990 and has shown a sharp increase since the mid-1990s. This fact suggests that Japanese households reduced their rate of savings along with the change in the composition of their savings during the 1990s and the 2000s.

The fourth fact is a substantial fall in nominal interest rate in the 1990s (see Figure 4 for the 10-year government bond yields). According to the Fisher relation, a low nominal interest rate means that the rate of returns on capital investments (the real interest rate) is close to that on money holdings (the expected deflation rate). Hence, the households' substitution of money for capital in their portfolios could be a rational reaction to a low interest rate. However, it should also be noted that this reaction of households could generate a low interest rate itself because an increased

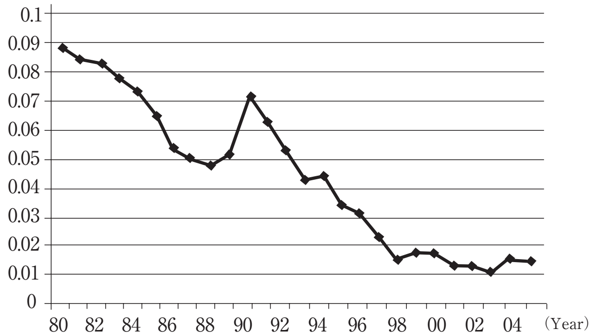
3) During the 1990s and the 2000s, a similar change in the portfolios was also observed—that is, Japanese banks substantially increased the holdings of government bonds, while decreasing the loans to private firms. In this respect, the shift from capital to money that I analyze in this paper may symbolize a more extensive portfolio change during Japan's stagnation, namely, the shift from private obligations to nominally-denominated public obligations.

Figure 3 Consumption propensity (the ratio of private consumption to national income)



Sources: Annual Report on National Accounts, Cabinet Office, Government of Japan.

Figure 4 Nominal interest rate (the 10-year government bond yields)



Sources: Financial and Economic Statistics Monthly, Bank of Japan.

demand for money leads to deflation, which in turn reduces a nominal interest rate through the Fisher relation. In this sense, a low interest rate may not only be a *microeconomic cause* of the flight from capital by households but its *macroeconomic consequence* as well.

The final fact is a substantial rise in labor share (see Figure 5 for the ratio of employees' compensation to national income). The labor share was stable until the 1980s, but showed a sharp increase during the 1990s. Further, the labor share decreased from the early 2000s, but it has still kept a fairly high level compared with that of the 1980s. Hashimoto (2002) referred to this phenomenon as the profit-squeeze problem since it means that total income growth lagged behind wage growth during the 1990s. Some authors think of the labor market rigidity as the cause of the profit-squeeze problem. Ando, Christelis, and Miyagawa (2003) argued that the downward rigidity of nominal wages caused the continuous decline in the rate of profits. Specifically, estimating the factor-price frontier of the Japanese economy, Miyagawa (2005) demonstrated that the Keynesian-type wage rigidity worked as a mechanism to magnify the adverse effects of negative supply shocks on firms' profits. Hashimoto (2002) also pointed out that there was a vicious cycle in the profit-squeeze problem—that is, the depressed capital investments due to the decline in the rate of profits deterred the improvement of labor productivity, which caused a further decline in the rate

Figure 5 Labor share (the ratio of employees' compensation to national income)

Sources: Annual Report on National Accounts, Cabinet Office, Government of Japan.

of profits. Complementary to these labor market rigidity explanations, other authors focus on the misallocation of capital during Japan's stagnation. Peek and Rosengren (2005) found that poor-performing firms attracted more bank credit than well-performing firms during the 1990s. Hosono and Sakuragawa (2002) related this misallocation of capital to the Japanese banks' incentive to comply with the Basle capital standards by extending credit to insolvent firms. Caballero, Hoshi, and Kashyap (2008) argued that such a practice of bank lending not only kept unprofitable firms alive but also caused severe distortions in the rest of the economy —that is, by maintaining their employment and market share, the unprofitable firms raised market wages and lowered product prices, which in turn discouraged more profitable firms' entry and generated an economy-wide reduction in firms' profits. Furthermore, during the 1990s, the Japanese government used fiscal measures to help underperforming firms to maintain their employment. This type of inefficient employment protection also squeezed firms' profits by keeping high wages throughout the economy. Admittedly, all of these factors were mutually reinforcing in worsening the profit-squeeze problem during Japan's stagnation. However, if one would seek the ultimate source behind these factors, it was the vacuum of governance in Japanese firms—that is, Japanese banks that suffered from severe non-performing loan problems have declined influence on corporate control, but the resultant vacuum of governance has not yet been filled by stock market discipline in forms such as takeover threats. In fact, if effective governance mechanisms existed, they could (sooner or later) promote proper adjustments of wages and correct misallocations of labor and capital in order to protect firms' profits.

This paper argues that all of the five facts mentioned above can be simultaneously captured in a single optimizing OLG model of endogenous growth. The merit of the adoption of the OLG model as an analytical framework is that it is a natural framework to address the "store of value" role of money, in which money competes with capital as a means of savings. By virtue of this property, departing from the classical dichotomy, the OLG model can describe the situation where a decline in nominal interest rate and a resultant rise in money demand deters capital accumulation and economic growth.[4] Specifically, taking the profit-squeeze problem of Japanese firms as the starting point, my model describes households' shift from capital to money in their portfolios as a rational reaction to the problem. Further, this reaction is not only caused by the low nominal interest rate, but also causes the low nominal interest rate itself through the deflation created by the increased demand for money. The important prediction of my model is that, when the profit-squeeze problem is sufficiently deepened, this positive feedback between money demand and interest rate can accelerate the substitution of money for capital and severely depress capital accumulation.

The present analysis is related to several strands of previous research. First, in contrast to the Keynesian demand-deficiency theories, my explanation does not rely upon the nominal rigidity such as the nominal interest rate rigidity due to its irreducible floor.[5] In other words, the present analysis assumes that the aggregate demand is always equated to the aggregate supply. In this respect, my theory might be viewed as a version of the neo-classical supply-side theories which argue that Japan's stagnation can be interpreted as a decrease in the potential growth rate of the economy; see, among others, Hayashi and Prescott (2002), who understood Japan's stagnation in terms of the decline in the growth rate of total factor productivity (TFP). However, most of the supply-side theories focus only on the real side of the economy and abstract from monetary phenomena. The notable exception is Andolfatto (2003), who extended the Hayashi-Prescott model into a monetary growth model. However, the Hayashi-Prescott-Andolfatto framework is an exogenous growth model, in which the long-run growth rate is solely determined by the exogenous productivity growth rate. Hence, while the Andolfatto framework is a monetary growth model, the growth rate obtained there may be basically independent of monetary phenomena. By contrast, the adoption of an endogenous growth model in this paper may be an attempt to link the observed monetary phenomena (i.e., the decline in nominal interest rate and the resultant rise in money demand) with the decline in growth rate and to search for a new mechanism behind Japan's growth slowdown. Specifically, the focus is on the substitution of money for capital generated by the low nominal interest rate, which deters capital accumulation and economic growth. By virtue of this linkage between real side and nominal side of the economy, my analysis can simultaneously capture the decrease in growth rate, the increase in money demand, and the low nominal interest rate as interconnected phenomena.

Second, my theory bears some resemblance to the theory of flight to quality in that investors flee from capital to safe and liquid assets (see, for a recent contribution, Caballero and Krisnamurthy, 2008). However, the theory of flight to quality focuses on an increase in the risks on capital which triggers the flight from capital and generates a sudden and acute financial crisis. By contrast, my theory focuses on a decrease in the returns on capital which triggers the flight from capital and generates a chronic economic stagnation.

Third, my explanation is related to research on the macroeconomic consequences of incomplete contracting. As is well known, in partial equilibrium settings, the problem of incomplete contracting usually leads to the underinvestment of appropriated production factors (see, among others,

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4) By contrast, in the representative agent model where each agent has an infinite horizon, the speed of capital accumulation and the economic growth rate are independent of the changes in nominal interest rate or money demand, due to the dichotomy between real side and nominal side of the economy.

5) See, for example, Krugman (1998) for the role of the irreducible floor of the nominal interest rate played in prolonged demand deficiency.

Williamson, 1979; Grout, 1984; Grossman and Hart, 1986). However, in general equilibrium settings, the price mechanism may partially compensate the appropriated factors, while generating other severer problems such as the unemployment of appropriating factors and the segmentation between employed winners and unemployed losers in the markets of appropriating factors (see Caballero and Hammour, 1998; Blanchard, 1997). In my model, reacting to the weak governance problem, households flee from appropriated capital to non-appropriated money. Corresponding to this reaction, the price mechanism recompenses for households by decreasing the gap between the rate of returns on capital investments and that on money holdings (i.e., by creating a low nominal interest rate). However, this further promotes the flight from capital by households and severely depresses capital accumulation. In this sense, the price mechanism, after all, may provide a damaging *macroeconomic* solution to the *microeconomic* governance problem.

The rest of the paper is organized as follows. The next section sets up the model and derives the equilibrium solutions of the real growth rate, the Marshallian k, the consumption propensity, and the nominal interest rate. Section 3, based on the theoretical results of section 2, studies the effects of the governance problem on those macroeconomic variables numerically and compares the predictions of the model with the facts of Japan's stagnation. Section 4 concludes the paper.

2 The model

The model is a version of the Yaari (1965)-Blanchard (1985) OLG model.[6)] However, the model differs from their original version in the following three points: (i) Real money balances enter the utility function;[7)] (ii) aggregate output is proportional to accumulated production factors, which may allow an endogenous growth of the economy;[8)] and (iii) factor shares are not determined in competitive factor markets but are determined in the bilateral bargaining between capital and labor.[9)]

2.1 Production

The economy is assumed to produce output using capital and labor. Capital is accumulated according to the following differential equation:

$$Y_t = C_t + \dot{K}_t + \delta K_t, \tag{1}$$

where Y_t is the aggregate output, C_t is the aggregate consumption, K_t is the aggregate capital, δ is the depreciation rate of capital (which is a constant with $0 \leq \delta < 1$), and subscript t denotes time.

At each time, a large cohort of agents is born, the size of which is θ where $\theta > 0$. Each agent faces a constant probability of death θ during his lifetime. Thus, the size of the population is constant and equal to unity over time. Further, I assume that the labor supply of each agent declines at a constant rate ω during his lifetime. This assumption may capture each agent's "retirement"

6) Alternatively, I can employ the Weil (1989) model, which yields a similar result to the Yarri-Blanchard model.

7) See, for example, Marini and van der Ploeg (1988), Kawai and Maccini (1990), Mino and Shibata (1995) for extensions of the Yarri-Blanchard-Weil model to include money in the utility function.

8) See, for example, Saint-Paul (1992), Buiter (1993), and Jones and Manuelli (1992) for extensions of the Yarri-Blanchard-Weil model to allow endogenous growth.

9) See Bertola (1993, 1996), Alesina and Rodrik (1994), and Persson and Tabellini (1994) for the institutional and political determination of factor shares in endogenous growth models.

approximately —that is, the fact that the labor income of each agent eventually decreases with age.[10] Specifically, I assume that $l_t^s = l_s^s e^{-\omega(t-s)}$ and for normalization $l_s^s = \frac{\omega+\theta}{\theta}$, where l_t^s is the labor supply for time t of an agent born at time s. Thus, the aggregate labor supply for time t is given by $L_t = \int_{-\infty}^{t} l_t^s \theta e^{-\theta(t-s)} ds = 1$.

I do not explicitly model the detailed aspects of the economy's production side since they are not crucial to the issues addressed in this paper. Instead, I assume that the aggregate output is proportional to the accumulated aggregate capital:

$$Y_t = F(L_t, K_t) = \tilde{A} K_t, \qquad (2)$$

where $\tilde{A}$ is a positive constant.[11]

In order to discuss the effects of the profit-squeeze caused by the weak governance problem, I suppose that the shares of capital and labor are determined by the relative strength of the bargaining powers of capital and labor. This formulation implies that capital returns are thought of not as marginal products of capital but as "pledged incomes" of investors (i.e., part of firms' profits seized by investors) in the model. Then, denoting the share of labor in national income by ϕ, I define

$$w_t = \phi A K_t, \quad r_t = (1-\phi) A, \text{ and } \phi \geq \Phi > 0, \qquad (3)$$

where w_t is the income flow accruing to a unit of labor (henceforth called the real wage), r_t is the income flow accruing to a unit of capital (henceforth called the real interest rate), and $A \equiv \tilde{A} - \delta$. The relative strength of the bargaining powers of capital and labor is thought of as significantly affected by the effectiveness of corporate governance mechanisms such as disclosure rules, corporate laws, and markets for corporate control. Then, I assume that the weak governance is associated with a low capital share. Specifically, taking Φ as the labor share obtained under the effective corporate governance, $(\phi - \Phi) A K_t$ can be interpreted as the rents for workers created by weak governance. Note also that the real interest rate is determined by the parameters that are assumed to be exogenous in the model, ϕ and A; hence, I hereafter drop the time subscript from the real interest rate (i.e., $r_t = r$).

2.2 Consumer behavior

Each agent maximizes the expected discounted sum of utilities:

$$\int_t^{\infty} (\ln c_v^s + \beta \ln m_v^s) e^{-(\rho+\theta)(v-t)} dv \qquad (4)$$

subject to $\dot{f}_v^s = (\theta + r) f_v^s + w_v l_v^s + \tau_v^s - c_v^s - i_v m_v^s$ and $\lim_{v \to \infty} f_v^s e^{-(\theta+r)(v-t)} = 0$, where c_v^s, m_v^s, $w_v l_v^s$, and τ_v^s are respectively real consumption, real money balances, real labor income, and real government transfers for time v of an agent born at time s; $f_v^s = m_v^s + k_v^s$ is the nonhuman wealth (k_v^s is the capital for time v that is owned by an agent born at time s); $i_v = r + \pi_v$ is the

10) The assumption of declining labor supply may create the strong incentive to save for "retirement". This incentive can contribute to lowering the nominal interest rate in the model, which in turn promotes the substitution of money for capital by households.

11) Let us consider a production function of the Romer (1986) type, which takes into account the external effect of aggregate capital deepening on the productivity of labor. The simplest form of such production functions may be given by $Y_t = \{a(K_t) L_t\}^{\alpha} K_t^{1-\alpha}$, where $a(K_t)$ is the external effect of capital deepening. Then, if I assume a linear external effect of capital deepening, that is, $a(K_t) = \tilde{A}^{\frac{1}{\alpha}} K_t$, I obtain $Y_t = \tilde{A} K_t$ since $L_t = 1$.

nominal interest rate (π_v is the expected and actual inflation rate), ρ is the subjective rate of time preference, and β is a positive constant that parameterizes the relative importance of money in each agent's utility. For tractability, I further assume that the government transfers provided to each agent are proportional to his labor supply—that is, $\tau_v^s = \tau_v l_v^s$, where τ_v is the government transfers for a unit of labor supply.

Note that the future utilities are discounted not only by the subjective rate of time preference, but also by the probability of death. This is because each agent faces a constant probability of death, and hence he discounts the future utilities by the age-independent life expectancy, θ^{-1}. Meanwhile, the reason why the returns on the nonhuman wealth are equal to $\theta + r$ is as follows. I assume that each agent has no bequest motive. Hence, he wants to eliminate all of his unintended bequests in the forms of nonhuman wealth when he dies (note that his human wealth created by his future labor supply obviously becomes zero when he dies). He can eliminate unintended bequests by participating in annuity arrangements in which he receives an annuity premium when he does not die in exchange for all of his nonhuman wealth remaining when he dies. Specifically, I assume that the annuity arrangements are actuarially-fair, and hence, if his nonhuman wealth is f_v^s, he receives θf_v^s when he does not die and he pays f_v^s when he dies.

Solving the maximization problem (4) under these assumptions, I obtain

$$
\begin{aligned}
c_t^s &= \frac{\theta+\rho}{1+\beta}(f_t^s + h_t^s), \\
m_t^s &= \frac{\beta c_t^s}{i_t}, \\
h_t^s &= \int_t^\infty (w_v + \tau_v) l_v^s e^{-(\theta+r)(v-t)} dv \\
&= \frac{\omega+\theta}{\theta} e^{\omega s + (\theta+r)t} \int_t^\infty (w_v + \tau_v) e^{-(\omega+\theta+r)v} dv,
\end{aligned}
\tag{5}
$$

where h_t^s is the human wealth for time t of an agent born at time s, which is the expected discounted sum of labor incomes and government transfers.

2.3 Aggregate relationships

Note that the aggregate variable can be obtained as $X_t = \int_{-\infty}^t x_t^s \theta e^{-\theta(t-s)} ds$, where the uppercase letter, X_t, is the aggregate variable of the variable represented by the lowercase letter, x_t^s. Hence, using the results in section 2.2, I can obtain the following aggregate relationships:

$$C_t = \frac{\theta+\rho}{1+\beta}(F_t + H_t), \tag{6}$$

$$M_t = \frac{\beta C_t}{i_t}, \tag{7}$$

$$F_t = M_t + K_t, \tag{8}$$

$$\dot{F}_t = rF_t + w_t + \tau_t - C_t - i_t M_t, \tag{9}$$

$$\dot{H}_t = (r + \theta + \omega) H_t - w_t - \tau_t. \tag{10}$$

Next, I close the model by specifying the government behavior captured by the following budget constraint:

$$\dot{M}_t+\pi_t M_t=\mu M_t=\tau_t, \tag{11}$$

where μ is the growth rate of nominal money.

The dynamic system comprised of Equations (6)-(11) can be easily reduced to a simpler system which does not include the human wealth, H_t. Equations (6), (7), (8), (9), and (10) give

$$\dot{C}_t=(r-\rho+\omega)C_t-\frac{(\theta+\omega)(\theta+\rho)}{1+\beta}(M_t+K_t), \tag{12}$$

and Equations (7) and (11) give

$$\dot{M}_t=(r+\mu)M_t-\beta C_t. \tag{13}$$

Equations (12) and (13), together with the differential equation of capital accumulation, $AK_t=C_t+\dot{K}_t$, constitute the basic equations of my analysis.

2.4 Balanced growth and steady-state equilibrium

I here define $\sigma_t\equiv\frac{C_t}{AK_t}$ (consumption propensity) and $\kappa_t\equiv\frac{M_t}{AK_t}$ (Marshallian k). I focus on the balanced growth path, on which output, capital, consumption, and real money balances grow at the same rate. Denoting this balanced growth rate by g_t, I obtain

$$g_t=\frac{\dot{Y}_t}{Y_t}=\frac{\dot{K}_t}{K_t}=\frac{\dot{C}_t}{C_t}=\frac{\dot{M}_t}{M_t}=A(1-\sigma_t). \tag{14}$$

Then, I can rewrite Equations (12) and (13) as follows:

$$\begin{aligned}\dot{\sigma}_t&=(r-\rho+\omega-g_t)\sigma_t-\frac{(\theta+\omega)(\theta+\rho)}{1+\beta}(\kappa_t+\frac{1}{A})\\&=\{A(1-\phi)-\rho+\omega-A(1-\sigma_t)\}\sigma_t-\frac{(\theta+\omega)(\theta+\rho)}{1+\beta}(\kappa_t+\frac{1}{A})\end{aligned}, \tag{12'}$$

$$\dot{\kappa}_t=(r+\mu-g_t)\kappa_t-\beta\sigma_t=\{A(1-\phi)+\mu-A(1-\sigma_t)\}\kappa_t-\beta\sigma_t. \tag{13'}$$

Noting that $\dot{\sigma}_t=\dot{\kappa}_t=0$ holds on the balanced growth path, I obtain the steady-state equilibrium of the four endogenous variables, κ (Marshallian k), σ (consumption propensity), g (growth rate), and i (nominal interest rate), which are the concern of the current analysis. I derive the four equations (15), (16), (17), and (18) from (12)', (13)', (14), and (7) respectively. Note that the system of equations comprised of (15)-(18), which determines the steady state values of the four endogenous variables, has a recursive structure. Hence, I first obtain the steady state values of κ and σ as the solutions of (15) and (16). Then, using the steady-state values of κ and σ, I obtain that of g as the solution of (17) and that of i as the solution of (18).

$$\kappa^*=\frac{1+\beta}{(\theta+\omega)(\theta+\rho)}\{A(\sigma^*-\phi)-\rho+\omega\}\sigma^*-\frac{1}{A}, \tag{15}$$

$$\kappa^*=\frac{\beta\sigma^*}{A(\sigma^*-\phi)+\mu}, \tag{16}$$

$$g^*=A(1-\sigma^*), \tag{17}$$

$$i^*=\frac{\beta\sigma^*}{\kappa^*}, \tag{18}$$

where the asterisk letters denote the steady-state values of the endogenous variables.

Here, let us check some properties associated with this steady-state equilibrium. First, the $\dot{\sigma}=0$ locus given by Equation (15) is a parabola in the $\sigma-\kappa$ plane. Since the last term in the RHS of (15)

Figure 6 Case (i) $\phi-\frac{\mu}{A}<0<\bar{\sigma}$

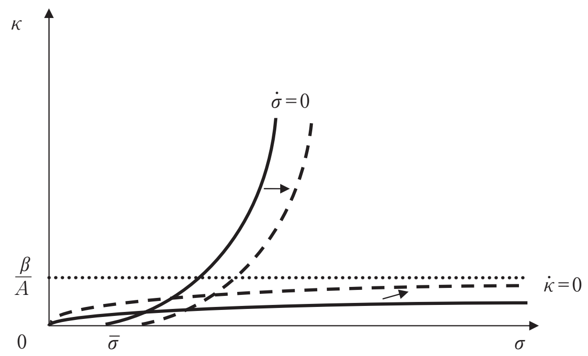
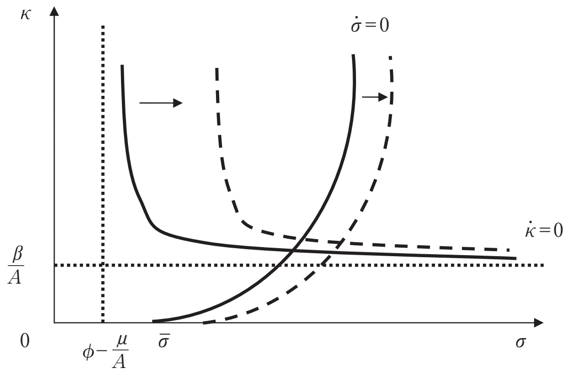


Figure 7 Case (ii) $0\leq\phi-\frac{\mu}{A}<\bar{\sigma}$



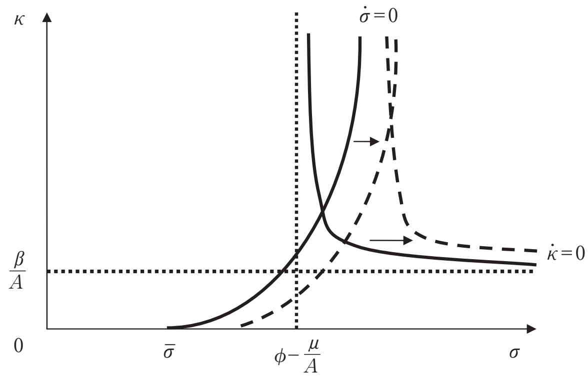
is negative, this parabola intersects the σ axis at one positive point and one negative point. Specifically, the positive intersection is given by $(\bar{\sigma}, 0)$, where $\bar{\sigma}\equiv\frac{A\phi+\rho-\omega}{2A}+\sqrt{\left(\frac{A\phi+\rho-\omega}{2A}\right)^2+\frac{(\theta+\omega)(\theta+\rho)}{(1+\beta)A^2}}>0$. Meanwhile, the $\dot{\kappa}=0$ locus given by Equation (16) is a hyperbola. This hyperbola has a horizontal asymptote $\kappa=\frac{\beta}{A}>0$ and a vertical asymptote $\sigma=\phi-\frac{\mu}{A}$, and always passes through the origin $(0, 0)$. Notice also that when the labor share ϕ increases, both $\bar{\sigma}$ and the vertical asymptote $\sigma=\phi-\frac{\mu}{A}$ move rightward, but the latter moves faster than the former. Given this property, I can separately consider the following three cases:

Case (i) $\phi-\frac{\mu}{A}<0<\bar{\sigma}$, case (ii) $0\leq\phi-\frac{\mu}{A}<\bar{\sigma}$, and case (iii) $0<\bar{\sigma}\leq\phi-\frac{\mu}{A}$.

I depict the steady-state equilibrium of the three cases in Figure 6, Figure 7, and Figure 8, respectively. In each case, it can be seen that there is a unique solution $(\sigma^*, \kappa^*)>(0, 0)$. Further, it can be easily confirmed that the solution is a unique perfect-foresight equilibrium of the dynamical system of (12)' and (13)': see Appendix for the proof.

Nonetheless, the derivation of the explicit solutions of σ^* and κ^* from Equations (15) and (16) is

Figure 8　Case (iii) $0<\bar{\sigma}\leq\phi-\frac{\mu}{A}$



somewhat complex. Hence, in the next section, I rely upon numerical examples to uncover the relationships between σ^*, κ^*, g^*, i^*, and ϕ. However, before that, it is helpful to notice the following properties of the relationships between σ^*, κ^*, and ϕ. In case (i) and case (ii) depicted in Figures 6 and 7, as the labor share ϕ increases, the steady-state equilibrium (σ^*, κ^*) moves mainly rightward and its upward movement is limited. Hence, in these cases, an increase in the labor share ϕ produces only a small increase in κ^*. Meanwhile, in case (iii) depicted in Figure 8, as the labor share ϕ increases, the steady-state equilibrium (σ^*, κ^*) exhibits not only a rightward movement but also a significant upward movement. Hence, in this case, an increase in the labor share ϕ produces a large increase in κ^* (In Figures 6, 7, and 8, the shifts of $\dot{\sigma}=0$ and $\dot{\kappa}=0$ caused by an increase in ϕ are depicted as the movements from the solid curves to the dashed curves).

These properties suggest that the following regime change in capital accumulation occurs according to an increase in the labor share. When the labor share is small, the substitution of money for capital generated by an increase in the labor share is moderate. Meanwhile, when the labor share is large, it can be substantial. In other words, when the governance problem is aggravated beyond a critical level, it accelerates the substitution of money for capital, which in turn severely depresses capital accumulation.

3　Theoretical predictions

Based on numerical solutions, this section visualizes the theoretical relationships between ϕ and σ, κ, g, and i. Of course, the present model abstracts from many important ingredients of the real economy such as international trade, government expenditures, income taxes, and the money holdings of financial institutions and firms. Hence, the comparison between theory and reality here is, in essence, merely a qualitative one, although I try roughly realistic values for some parameters.

First, taking the time unit as a year, I adopt parametric assumptions such that $\rho=0.02$ (implying that the one-year discount factor is approximately 0.98) and $\theta=0.02$ (implying that the average length of each agent's adult life is 50 years). The values of other parameters are not easy to specify in isolation. Hence, using Equations (15)–(18), I specify the values of the parameters as those giving roughly realistic values of the real growth rate, the Marshallian k, the consumption propensity, the

Figure 9 The relationship of labor share and real growth rate

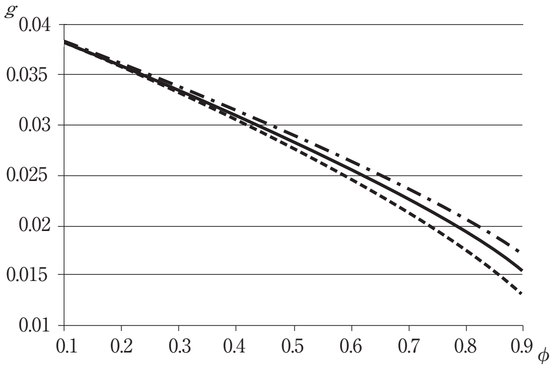
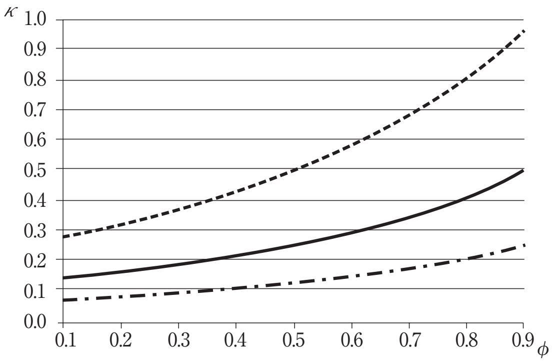


Figure 10 The relationship of labor share and Marshallian k



nominal interest rate, and the labor share. Specifically, inserting the average values from 1981 to 2000 of these macroeconomic variables ($g=0.024$, $\kappa=0.38$, $\sigma=0.70$, $i=0.04$, and $\phi=0.70$) into those equations, I obtain the baseline parameter values as their solutions: $A=0.08$, $\mu=0.04$, $\beta=0.02$, and $\omega=0.11$. Further, since the reality of the values of β and ω is harder to evaluate, compared with those of A and μ, I also try both a relatively small value and a relatively large value for β (and the corresponding values of ω obtained from (15)); that is, $\beta=0.01$ and $\omega=0.12$; and $\beta=0.04$ and $\omega=0.10$.

Under these parametric assumptions, let us examine whether the theory can produce results consistent with the observations about the macroeconomic variables under consideration. First, Figure 9 depicts the relationship between the labor share and the real growth rate (The solid line depicts the baseline case, the dashed line depicts the case of the small β and the dotted line depicts the case of the large β). The theoretical prediction indicates that the real growth rate decreases with the labor share. In reality, although the relationship is somewhat disordered, it essentially displays a similar negative relationship. The theoretical prediction also indicates that the relationship exhibits concavity. This concavity reflects the fact that the accelerated shift from capital to money severely depresses capital accumulation when the profit-squeeze problem is sufficiently deepened. Next, Figure 10 depicts the relationship between the labor share and the

Figure 11 The relationship of labor share and consumption propensity

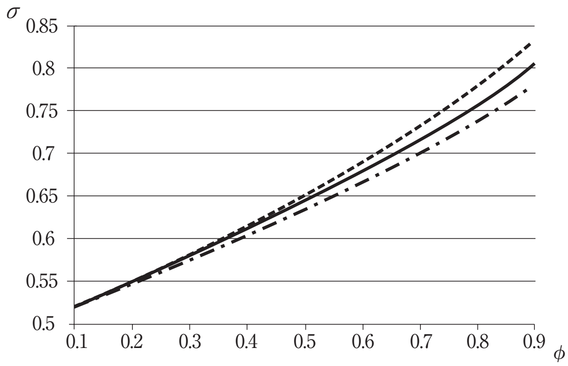
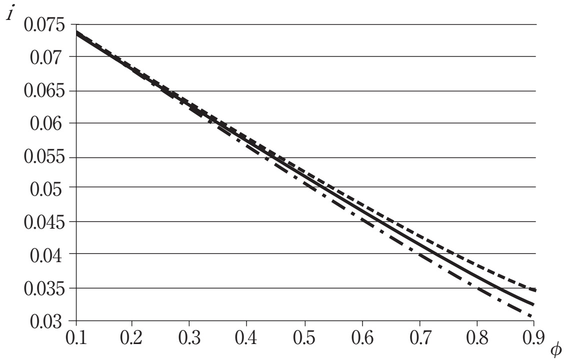


Figure 12 The relationship of labor share and nominal interest rate



Marshallian k. The theoretical prediction indicates that the Marshallian k increases with the labor share. The notable feature is that the relationship exhibits convexity. This convexity is, of course, the other side of the coin of the concavity in the relationship between the labor share and the real growth rate; that is, it stems from the accelerated shift from capital to money due to a sufficiently deepened profit-squeeze problem. Third, Figure 11 depicts the relationship between the labor share and the consumption propensity. The theoretical prediction indicates that the consumption propensity increases with the labor share. This prediction is again consistent with the observation during the 1990s. Finally, Figure 12 depicts the relationship between the labor share and the nominal interest rate. The theoretical prediction indicates that the nominal interest rate decreases with the labor share. As shown by these figures, the theoretical predictions based on numerical examples can simultaneously capture the qualitative features of the key macroeconomic variables during Japan's lost decade—that is, the theory produces a decline in real growth rate, a rise in Marshallian k, a rise in consumption propensity, and a decline in nominal interest rate as interconnected phenomena.

4 Concluding remarks

This paper has attempted to propose an alternative interpretation of Japan's stagnation based on a dynamic macroeconomic model with optimizing agents. The starting point of the explanation is the profit-squeeze that may be generated by the weak governance problem in Japanese firms. Japanese households, reacting to this problem, substitute non-productive money for productive capital in their portfolios. This reaction is a rational solution to the governance problem from the perspective of the individual household, but it can also be a damaging solution from the macroeconomic standpoint.

What, then, is the true solution if the governance problem is the critical source of Japan's stagnation? Two different institutional solutions eliminating the governance problem might be proposed. One can be called "labor-capital cooperation," which might have prevailed in the Japanese firms of the 1960s and 1970s. In this "cooperative" solution, by internalizing the harmful effects of the profit-squeeze problem on capital and eventually on labor, workers voluntarily moderate their wage demands so as to guarantee a proper rate of returns on capital. The other could be named "shareholder capitalism." In this "non-cooperative" solution, shareholders should have the strong rights in order to balance the powers of capital and labor and thereby guarantee a proper rate of returns on capital. Of course, the pros and cons of the two solutions admittedly depend not only on the economic environment but also on the political and social structures surrounding the process of factor shares determination. Hence, the answer to the question of which is a more appropriate solution should be the theme of careful future study.

Appendix

This appendix examines the local stability of the dynamical system of (12)' and (13)'. The Jacobian matrix of the linearized system around (σ^*, κ^*) is given by

$$J=\begin{pmatrix} A(2\sigma^*-\phi)-\rho+\omega & -\dfrac{(\theta+\omega)(\theta+\rho)}{1+\beta} \\ A\kappa^*-\beta & A(\sigma^*-\phi)+\mu \end{pmatrix}.$$

First, note that at (σ^*, κ^*) the $\dot{\sigma}=0$ locus crosses the $\dot{\kappa}=0$ locus from below, as seen in Figures 6, 7, and 8. This implies

$$\left.\frac{d\kappa}{d\sigma}\right|_{\dot{\sigma}=0,\,\sigma=\sigma^*,\,\kappa=\kappa^*}=\frac{\{A(2\sigma^*-\phi)-\rho+\omega\}(1+\beta)}{(\theta+\omega)(\theta+\rho)}>\left.\frac{d\kappa}{d\sigma}\right|_{\dot{\kappa}=0,\,\sigma=\sigma^*,\,\kappa=\kappa^*}=-\frac{A\kappa^*-\beta}{A(\sigma^*-\phi)+\mu}.$$

Hence, det $J>0$.

Next, note that $A(2\sigma^*-\phi)-\rho+\omega=A\sigma^*+\dfrac{(\theta+\omega)(\theta+\rho)}{1+\beta}(\kappa^*+\dfrac{1}{A})\dfrac{1}{\sigma^*}>0$ and $A(\sigma^*-\phi)+\mu=\dfrac{\beta\sigma^*}{\kappa^*}>0$. Hence, trace $J>0$.

Thus, J has two unstable roots. Consequently, (σ^*, κ^*) is a unique perfect-foresight equilibrium of the dynamical system of (12)' and (13)', since the system contains two jumping variables.

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《SUMMARY》

MACROECONOMICS OF WEAK CORPORATE GOVERNANCE: AN ALTERNATIVE THEORY OF JAPAN'S LOST DECADE

By HIDEAKI MURASE

This paper offers a theory to simultaneously explain the facts of Japan's lost decade. The focus is on the profit-squeeze problem of Japanese firms. Reacting to this problem, households substitute money for capital in their portfolios. This reaction is supported by a low nominal interest rate, but at the same time supports it. Specifically, when the problem is aggravated beyond a critical level, this self-reinforcing loop can severely depress capital accumulation, which may trap the economy in a prolonged stagnation.

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