Japan: Selected Issues

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INTERNATIONAL MONETARY FUND

JAPAN

Selected Issues

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I. THE IMPACT OF FISCAL CONSOLIDATION AND STRUCTURAL REFORMS ON GROWTH IN JAPAN[1]

A. Introduction

1. **With Japan's public debt at historic levels, concerns are rising over the growth impact of needed fiscal adjustment.** The severe recession and sizeable fiscal stimulus have pushed up Japan's public debt from 188 percent of GDP in 2007 to 218 percent of GDP in 2009. Bringing down the public debt ratio to more sustainable levels would require a large and sustained adjustment that has raised concerns about the possible impact on growth. Monetary policy is limited at the zero-bound to support fiscal consolidation, while Japan's aging population and low trend growth provide little room to absorb falling demand. At the same time, the evolution of the external environment will also affect Japan's growth prospects.

2. **Fiscal consolidation will require a sustained adjustment in the fiscal balance, covering both revenue and expenditure measures.** Based on staff's analysis, stabilizing and bringing down debt ratio over the medium-term would require a gradual adjustment in structural primary balance of about 10 percent of GDP over a decade. While a part of the adjustment could come from the expiry of fiscal stimulus package and cyclical factors, given the limited space for further expenditure cuts, the rest of the adjustment would have to rely on additional revenue measures including increases in the consumption tax.

3. **The growth effect of fiscal consolidation is a concern in the short-run.** The growth impact of such a large scale adjustment would depend on the composition of the measures adopted and will change over time. In the absence of any offsetting policies, growth is likely to slow in the short-run due to the withdrawal of demand. However over the medium-run, the benefits of fiscal consolidation are likely to dominate. International evidence suggests that sizeable fiscal consolidation could have limited growth effects if accompanied by positive supply response. For example, Germany's comprehensive tax reform in 2007 had an initial moderate negative impact, which was then offset by strong external demand and robust investment growth, in response to corporate tax reform in 2008.[2] Growth remained robust in 2008.

4. **Structural reforms could help offset the negative impact of fiscal consolidation and raise medium-term potential growth.** In this context, policies aiming at raising

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[1] Prepared by Pelin Berkmen. This chapter will be published as a forthcoming working paper.

[2] The tax reform package included an increase of the value added tax (VAT) rate from 16 to 19 percent, a reduction in payroll tax relief equivalent to 0.4 percent of GDP, and a reduction in the corporate income tax rate from 40 to 31 percent combined with some base broadening. Plans were announced in November 2005, and the increase of the VAT rate and the reduction in corporate income tax rate were implemented in 2007 and 2008 respectively. The structural fiscal deficit declined by 1 percentage point in 2007 helped by expenditure reductions, which were carried out in parallel.

services sector productivity through deregulation or increasing competition and labor market flexibility could support fiscal consolidation through higher tax revenues.

5.   **At the same time, changes in the global economy could affect the growth impact of consolidation in Japan.** A year after the global crisis, emerging market economies are leading the global recovery, while the pace of the recovery in advanced economies has been slower, and is still heavily dependent on policy support. As a result, output in most advanced economies remained below pre-crisis levels at end 2009. Japan's share of exports to advanced economies in total exports had been declining even before the crisis, from 75 percent in early 2000s to about 60 percent in 2008. After the crisis, this trend has continued, with the share of exports to China increasing to about 19 percent at the expense of exports to the United States and Euro Area. With the world still adjusting to post-crisis conditions, demand for Japanese products is likely to continue to shift from advanced economies to the fast growing emerging market world.
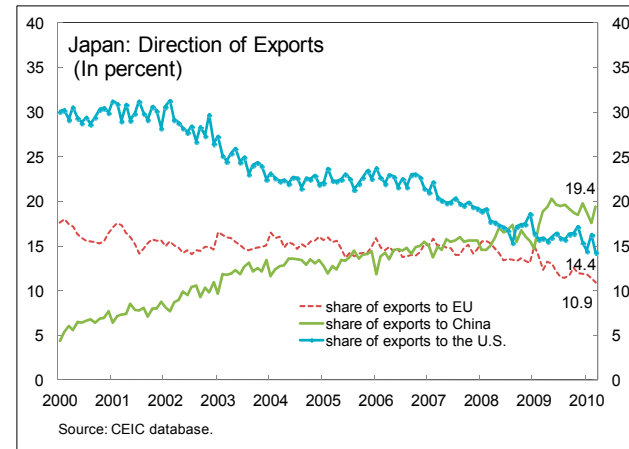
6.   **To assess the growth implications of fiscal consolidation and structural reforms, the chapter uses a 5-block version of the IMF's Global Integrated Monetary and Fiscal (GIMF) model.** [3] The model provides a good framework to capture the implications of the domestic and external changes. The model is non-Ricardian and has a rich set of fiscal instruments, which makes it suitable for simulating a detailed fiscal consolidation scenario. At the same time, the 5-block version features a detailed trade matrix allowing for an analysis of possible spillovers vis-à-vis the rest of the world. Simulations show that fiscal consolidation may not be very costly in the medium-term and, if combined with structural reforms, could hold the key for renewed economic strength**.** In addition, comprehensive reforms would allow Japan to benefit from changes in the world economic landscape as it re-orients its economy to fast growing emerging market economies. The remainder of the chapter lays out this argument in detail.

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[3] The five regions are the United States, the Euro Area, Japan, emerging Asia and other countries. The details of the model are presented at Kumhof and others (2010) and will not be repeated here. The appendix provides a brief summary of the model.

B. Impact of Fiscal Consolidation on Growth

7.   **About 10 percent of GDP adjustment in structural primary balance is needed to stabilize and reduce debt, with a part of the adjustment coming from cyclical factors and the rest from structural changes.** In particular adjustment of about 2½ percent of GDP could come from the expiry of fiscal stimulus package and cyclical factors. The remaining 7½ percent of GDP adjustment would need to come from additional expenditure and revenue measures. Given

Fiscal Consolidation Scenario: Improvement in Fiscal Balance (cumulative, in percent of GDP)
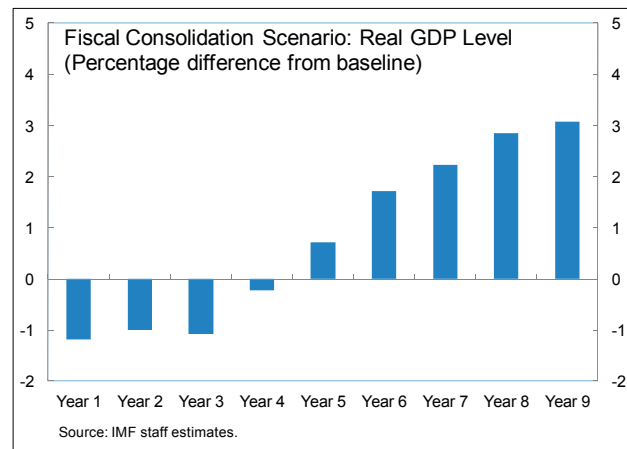
□ Government investment cut
▨ Government consumption cut
■ Corporate tax cut
■ Consumption tax increase
□ Other, including transfers

Source: IMF staff estimates.

the limited space for further expenditure cuts, additional adjustment would rely mainly on revenue measures, including increases in the consumption tax. The scenario assumes a phased in increase of the consumption tax with some frontloading, raising revenues by 5 percent of GDP and a decline in corporate income tax, reducing revenues by ½ percent of GDP. In addition, the scenario builds in a decline in government consumption by 2 percent of the GDP and in public investment by ½ percent of GDP. The rest of the adjustment comes from transfers.
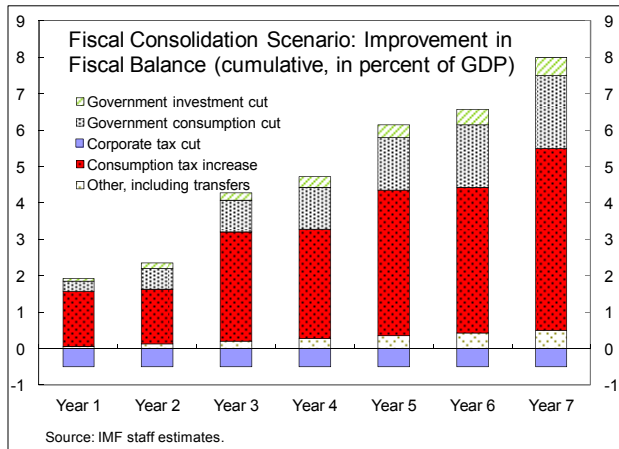
8.   **Without any additional policy measures, fiscal adjustment would depress GDP in the short-run by about 1 percentage point**.[4] The increase in the consumption tax, lower government consumption, and declining public investment all reduce domestic demand. However, the negative impact on investment is limited by the reduction in corporate taxes.

Fiscal Consolidation Scenario: Real GDP Level (Percentage difference from baseline)

Source: IMF staff estimates.

9.   **It is important to note that the particular composition of the fiscal consolidation is illustrative and can change the dynamics in both short and medium term.** On the revenue side, large increases in consumption tax will reduce consumption, but could be offset partly by lower corporate taxes, which stimulate investment. Higher investment would also increase demand for labor, increasing wage income and consumption. As consumption taxes are less distortionary in terms of their effect on output than labor and capital income taxes, a budget-neutral shift from corporate to consumption taxes would raise output. This effect,

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[4] The growth rate would be lower by 0.3–0.5 percentage points on average.

however, would be small in this scenario as the reduction in corporate taxes are limited compared with the increase in consumption taxes. On the expenditure side, reduction in public investment is likely to reduce private output in the medium-term as public sector infrastructure generally supplements private production. However, in Japan given that public investment is already low (about 2.5 percent of GDP), there is not much room for further significant cuts. Transfers, on the other hand, are likely to have more short term impact, particularly on individuals who are liquidity constrained.

10.   **Over the medium-term, however, real GDP could rise above the baseline by about 2-3 percentage points.** The main factors contributing to positive growth effects from fiscal consolidation are:

•   *Reduction in precautionary savings*. Part of the decline in consumption due to higher consumption taxes would be offset by a reduction in precautionary savings. In particular, younger generations who are concerned about fiscal sustainability and the pension system are potentially saving more now than otherwise. Although the size of the precautionary savings is hard to identify, we assume a conservative decline in savings by about 1 percentage points.[5]

•   *Limiting increases in the risk premium.* Although there is scant historical evidence of a sizeable risk premium on Japan's public debt, such a risk premium is likely to emerge over time in the absence of fiscal consolidation. Staff's calculations show that without any policy adjustment and given current trends in savings, gross public debt[6] could exceed gross households' financial assets in about 5 years (Tokuoka, 2010). This would likely lead to a higher risk premium and raise the cost of capital, thereby depressing investment and growth. Credible fiscal consolidation could contain increases in the risk premium, raising GDP above the levels in the no policy adjustment scenario. It is assumed that fiscal consolidation would reduce the risk premium by 50 basis points.[7]

•   *Switch to less distortionary corporate taxes*. As capital income taxes are more distortionary than consumption taxes, reducing corporate taxes would improve long-term output through higher investment. The chapter assumes a limited decline in corporate taxes, and higher reductions would enhance the growth benefits. There is a tradeoff, however, between these benefits and the amount of fiscal adjustment needed to bring the debt to sustainable levels.

•   *Confidence effects*. A credible fiscal consolidation could also improve business confidence and encourage investment and bring forward some of the growth benefits. With

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[5] There is a wide range of estimates of precautionary savings in Japan (ranging from 0 to 15 percent). Most studies are done with micro-level data for gross savings. As the net savings based on national income data are already relatively low, the precautionary effects are assumed to be limited to 0.5–1 percentage points.

[6] Including public debt owed by the Fiscal Investment and Loan Program.

[7] Given that most tail risk scenarios feature 100–200 basis points increase in risk premium, this is quite a mild assumption.

concerns over the fiscal situation and its implications for long-term growth prospects, business sentiment is likely to stay weak. However, improved expectations of stable economy and higher growth potential in the future would strengthen business sentiment and investment. This is consistent with evidence from firm-level data on investment in Japan, which show that uncertainty about the economic outlook has hampered investment, especially among SMEs (Syed and Lee 2010).

11.   **Fiscal adjustment will also raise national savings compared to the baseline**. This would pull up the medium-term trade balance by about 1 percentage point. A higher equilibrium current account surplus would imply more depreciated real exchange rate.

12.   **Monetary policy is assumed to be constrained by the zero interest rate bound, limiting its role in supporting fiscal consolidation.** With the policy rate held at zero level, inflation would fall below the baseline in the short-run, pushing up real interest rates and depressing demand further. However, over the long-run, higher national savings and lower risk premium would help lower real interest rates.

C. Impact of Combined Policy Package of Fiscal Consolidation and Structural Reforms

13.   **Structural reforms to boost potential growth could support growth during consolidation.** The authorities' medium-term growth strategy (to be released at end-June) highlights the importance of developing certain key sectors such as health and education. In this context, this chapter focuses on two main areas: increasing the productivity in the services sector and enhancing competition in labor and product markets.

14.   **Japan has considerable scope for raising productivity in the services sector.** Since 1990s, labor productivity level and growth in services have been lower than those of Japan's manufacturing sector.[8] Reasons include: a high degree of regulation in certain sectors, such as health, elderly care, and childcare, which may hold back needed productive investment. Retail services is another sector which has room for further efficiency gains. While identifying specific structural reforms to raise productivity in these sectors is beyond the scope of this analysis, this chapter looks at the implications of productivity increases in these sectors on the rest of the economy. Based on some sector-level studies and targets determined by the authorities' growth strategy, a reasonable assumption for productivity increase would be about 0.5-1 percentage points. The specific scenario assumed here is that the productivity in the non-tradables sector increase by one percentage point.

15.   **Furthermore, increasing competition in services and in labor markets would enhance productivity gains.** Relaxing barriers to entry in sectors such as medical and elderly care, and price regulations in a wide range of sectors in health and education could


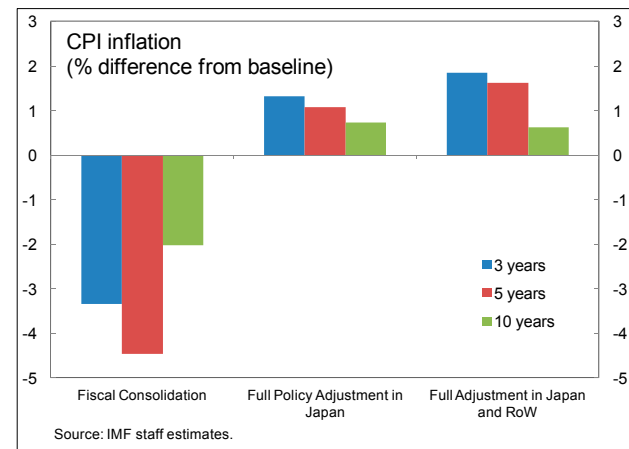[8] Khatri and Ogawa (2007), OECD (2008), Sommer (2009).

enhance competition and efficiency. In addition, introducing a new, more flexible regular labor contract could improve employment by encouraging new hires, especially among temporary workers. To simulate the improvement in competitiveness in product and labor markets, the mark-ups in the non-tradable and labor markets are reduced by about 2 percentage points.[9]

16. **A combined policy package of fiscal consolidation and structural reforms would improve GDP even in the short term.** The gains from improved productivity and competitiveness have the potential to offset the negative demand effects of fiscal consolidation in the short term. While productivity increases will accumulate gradually, a credible policy package, securing sustainable public debt as well as higher potential growth and competitiveness would advance investment and improve growth expectations.

Real GDP
(% difference from baseline)

- 3 years
- 5 years
- 10 years

Source: IMF staff estimates.
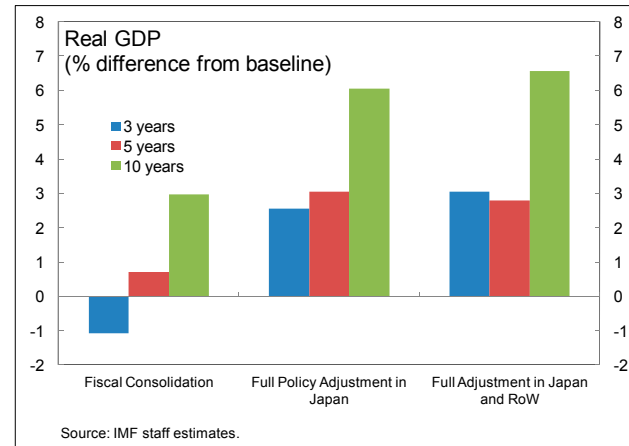
17. **Higher investment through structural reform would make up for the initial decline in consumption.** Real consumption would be still depressed in the short term with high consumption taxes, but will gradually recover in the medium term.[10] Wage capital income will be higher with higher investment and the associated increased demand for labor.

18. **Monetary policy is assumed to adjust in this scenario, allowing both inflation and nominal rates to rise.** With higher growth and inflation, interest rates turn positive allowing monetary policy to play a larger role. With the full adjustment in both exchange rates and interest rates, the real exchange rate depreciation is larger than otherwise, contributing further to export performance and trade balance. Higher GDP in the short-term also raises

CPI inflation
(% difference from baseline)

- 3 years
- 5 years
- 10 years

Source: IMF staff estimates.

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[9] This estimate is rather on the low side. There is a wide range of sector specific mark-ups. For example, OECD (2008) estimates that mark-ups in non-manufacturing sectors are three times higher than the mark-ups in manufacturing. Kiyota, et. al. (2008) finds that even in the low mark-up sectors, firms enjoy mark-ups above unity and entry of a firm has a negative impact on mark-ups.

[10] Consumption of the liquidity constrained agents would be lower owing to decline in transfers.

inflation above baseline. Although nominal interest rates are also higher, with higher inflation, real interest rates are lower than in the previous scenario.

D. Spillovers from the Rest of the World

19.   **Changes in the pattern of growth in the rest of the world are also likely to affect the impact of Japan's consolidation.** A year after the global crisis, attention has turned to policies to sustain balanced growth over the medium term, which would have implications for Japan's growth prospects. This section focuses on spillovers from two regions: emerging Asia and the U.S.

20.   **In emerging Asia, a comprehensive set of reforms is assumed to be implemented to sustain medium-term growth.** These reforms include: (1) structural reforms in the services sector that raise productivity accompanied with a shift in households' preference toward non-tradable goods; (2) fiscal reforms aimed at reducing precautionary saving by increasing coverage of education, health care, and pensions, and improving infrastructure in rural areas; (3) further financial development and liberalization (including interest rates) to enable better smoothing of household consumption, capital allocation, and improved risk management by banks, reducing credit constraints for households; and (4) a gradual real effective appreciation of the Asian currencies—10 percent over 10 years for illustrative purposes—that supports the transition to greater reliance on the non-tradable sector and stimulates private consumption by raising labor's share of income.[11]

21.   **In the United States, the private saving rate is assumed to increase in the aftermath of the recent global crisis.** In particular, it increases by 2½ percent of GDP above the baseline, while private investment is assumed to decline on account of household deleveraging and tighter financial regulation.

22.   **While the increase in savings in the U.S. reduces the demand for Japanese products, rebalancing in Emerging Asia has the potential to counter this decline.** The increase in U.S. savings has two main implications for Japan. First, demand for Japanese products decline, and second the yen appreciates, reducing trade balance and real GDP in Japan.[12] The rebalancing in emerging Asia,


Source: IMF staff estimates.

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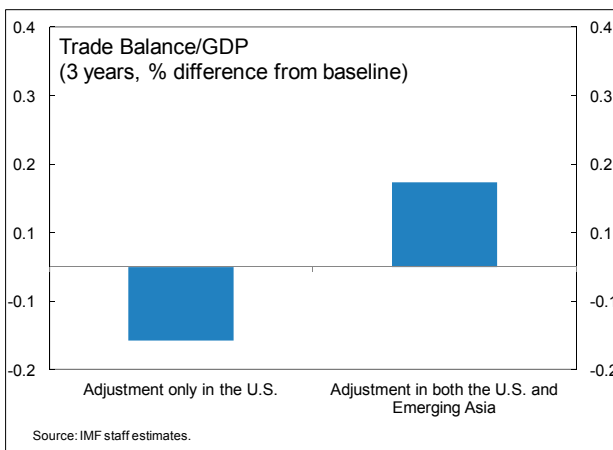
[11] This scenario is consistent with the rebalancing scenario analyzed in Chapter 3 of the Asia and Pacific Department's Regional Economic Outlook, April 2010.

[12] Higher national savings in the U.S., in the absence of any other changes in the rest of the world, would imply a higher current account and real effective depreciation in the U.S.

on the other hand, has offsetting effect, with demand for Japanese products increasing and the yen depreciating in real terms.

23.   Spillovers from the rest of the world are likely to benefit Japan over the medium-term, but sustaining growth in Japan still requires domestic policy action. While the adjustment in the rest of the world has positive spillovers on Japan, the growth impact is rather limited. Therefore, domestic policy adjustment is still needed to boost medium term-growth.

Source: IMF staff estimates.
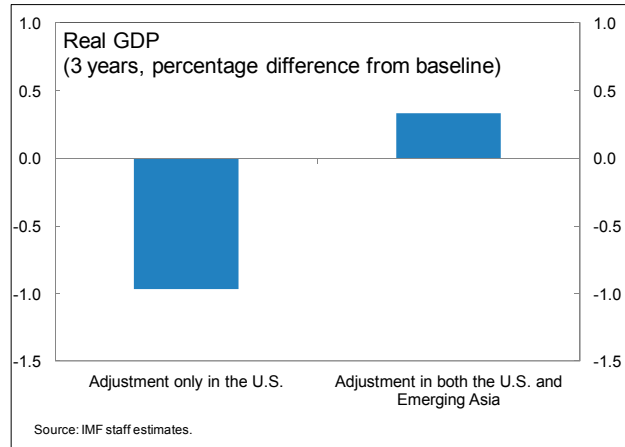
24.   A combined policy package of fiscal consolidation and growth enhancing reforms along with positive spillovers from the rest of the world would increase real GDP further. Under a full adjustment scenario, the decline in consumption is much milder, and mainly affects liquidity constrained agents. Over the long-run, labor shifts from tradable to non-tradable sector, and overall employment and wages increase. In the new equilibrium, the trade balance is still higher and the real effective exchange rate remains depreciated.

25.   The degree of productivity increases, decline in mark-ups, and confidence effects are all factors determining the magnitude of the growth impact. If the structural policies raise the productivity and reduces the mark-ups further, the long-term growth benefits would be higher than those obtained with these simulations. On the other hand, if the combined policy package is viewed as not credible, the confidence effects are not likely to advance the growth effects, and short-term negative demand effects are likely to dominate.

E.   Conclusions

26.   Although fiscal consolidation has short-term costs, the potential long-term benefits are considerable. With debt to GDP reaching historical levels, fiscal consolidation is unavoidable for Japan. The chapter shows that while fiscal consolidation has short term costs due to a sizeable increase in consumption taxes and expenditure containment, benefits would accrue in the long-term through lower precautionary savings, risk premium and corporate taxes, and improved confidence and investment. If policies are implemented credibly, the growth benefits can be captured earlier through increased investment.

27.   While adjustment is important for securing fiscal sustainability, reforms that raise potential growth could also support consolidation. In particular, raising the productivity in the services sector has tremendous potential for offsetting negative demand effects from fiscal consolidation.

28. **Simulations show that the external environment also matters but domestic policies should be the priority.** A full package of rebalancing in emerging Asia has the potential to offset the decline in demand from advanced economies, but its overall impact on growth is limited. Therefore, sustaining growth in a meaningful way would still require fiscal consolidation combined with structural reform.

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Appendix

Households and Firms

Each country is populated by two types of households, consuming final retail output and supplying labor to unions. First, there are liquidity constrained households who do not have access to financial markets, and who consequently are limited to consuming their after tax income in every period. Second, there are overlapping generation households with finite planning horizons. Each of these agents faces a constant probability of death. In addition to the probability of death, households also experience labor productivity that declines at a constant rate over their lifetimes. Households are subject to uniform labor income, consumption and lump-sum taxes.

Firms and unions are owned by households and therefore are myopic and have finite planning horizons. Except for capital goods producers, entrepreneurs and retailers, they are monopolistically competitive and subject to nominal rigidities in price setting. Manufacturers buy capital services from entrepreneurs and labor from unions. Unions buy labor from households. Entrepreneurs buy capital from capital goods producers. Entrepreneurs are subject to an external financing constraint and a capital income tax. Capital goods producers are subject to investment adjustment costs. Manufacturers sell to domestic and foreign distributors, through import agents located abroad. Distributors combine a public capital stock with nontradable goods and domestic and foreign tradable goods, subject to an import adjustment cost. They sell to domestic and foreign consumption and investment goods producers. Consumption and investment goods producers combine domestic and foreign output, again subject to an import adjustment cost. Consumption goods are sold to retailers and the government, while investment goods are sold to capital goods producers and the government. Retailers, who are also monopolistically competitive, are subject to real rigidities, which supplements inertial consumption dynamics.

The regions trade with each other at the levels of intermediate and final goods, with a matrix of bilateral trade flows that are calibrated on recent historical averages. International asset trade is limited to nominally non-contingent bonds denominated in U.S. dollars. The world economy's technology grows at the constant rate.

The Government and the Central Bank

Fiscal policy consists of a specification of government spending, lump-sum transfers, tax rates on labor, consumption and capital, and lump-sum taxes. Government consumption spending is unproductive, while government investment spending expands a stock of publicly provided infrastructure capital that depreciates. Tax revenue is endogenous and given by the sum of labor, consumption, capital and lump-sum taxes.

A fiscal policy rule stabilizes deficits and the business cycle. First, it stabilizes the interest inclusive government deficit to GDP ratio at a long-run target (structural) level which rules out default and fiscal dominance. Second, it stabilizes the business cycle by letting the deficit fall with the output gap. Fiscal policy can be characterized by the degree to which automatic stabilizers work, which is estimated by the OECD.

Monetary policy uses an interest rate rule to stabilize inflation. The rule is similar to a conventional inflation forecast based rule that responds to one year ahead inflation. In certain simulations in this paper, interest rates are kept constant to simulate effect of the zero bound on interest rate.

## II. Raising Medium-Term Growth: What Role can Investment Play?[1]

A. Introduction

1.   **Promoting investment will be crucial for raising Japan's medium-term growth prospects.** As population aging shrinks the labor force, capital accumulation and productivity gains will drive potential growth. However, a transformed post-crisis landscape is likely to necessitate some compositional shifts. First, investment by manufacturing exporters will need to be re-oriented toward products demanded by emerging markets to keep the external engine of growth robust. Second, the domestic sector will need to become another driver for growth, necessitating increased investments in services and domestically-oriented firms. Third, continued innovation will be critical to maintaining Japan's competitive advantage in global markets and boosting profitability and wages.

2.   **This chapter explores ways to facilitate the adjustment in investment patterns required over the medium-term.** Using disaggregated data on listed companies between 1990−2008, the paper investigates the role of economic fundamentals—expected profitability, access to external financing, capital structure, and uncertainty—in determining the investment behavior of Japanese firms. Both tangible and intangible capital are considered—in the form of fixed investment (plant, machinery and equipment) and R&D—and the main findings compared with those from other advanced economies. Based on these results, we discuss potential policies that could support Japanese investment in the post-crisis global economy.

B. Recent Investment Trends

3.   **At first blush, investment does not seem low in Japan or an obvious candidate for policy intervention.** After declining almost continuously until the early 2000s, investment has stabilized, and at around 23 percent of GDP is close to the OECD average. Fixed investment has fallen by some 9 percent of GDP, with private investment accounting for 70 percent of the decline. Partly following the asset bubble burst, residential construction and spending on plant and equipment have fallen by some 2½ and 4½ percent of GDP, respectively.

Gross Fixed Capital Formation (In percent of GDP)

Japan — Germany — U.K. — U.S.

Source: OECD.

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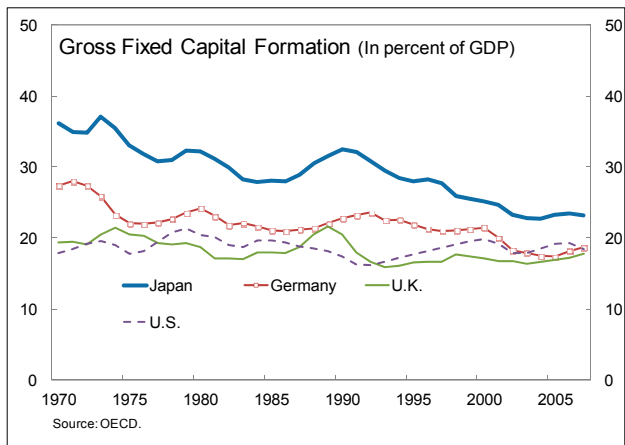
4.   **However, the composition of investment has shifted in recent years towards manufacturing and large firms**. During Japan's recovery (2002–07), fixed investment shifted markedly toward larger firms and manufacturing, particularly in the main exporting sectors: automobiles, machinery, electronics, and steel. The share of these four sectors in total investment rose from 19 to 31 percent between 2000 and 2007. As a result, domestic investment and trading partner demand have become increasingly correlated, magnifying Japan's vulnerability to external shocks. This was dramatically illustrated during the current crisis, with both exports and investment sharply contracting last year.

Japan: Total Investment By Sector (2006, in Percent of total)

Auto, IT, Machinery and Steel (31%)

Non-manufacturing (52%)

Other manufacturing (17%)

Source: EU KLEMS.
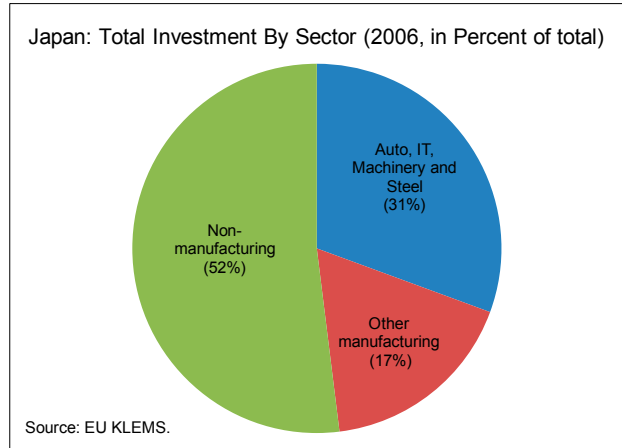
5.   **On the other hand, investment by SMEs and firms operating in the services sector has been relatively stagnant in real terms.** The share of the non-manufacturing sector in overall investment has fallen from 70 percent in 2000 to just over 50 percent. Despite broadly similar economic structures, this decline contrasts sharply with developments in comparator economies, where the starting share was similar but has now *risen* to around 80 percent.

Composition of Investment By Sector 1/
(In percent of total, at constant 1995 prices)

Non-manufacturing
Manufacturing

Japan   Germany   U.K.   U.S.

1990 2000 2007

Source: EU KLEMS Database.
1/ Excluding finance, insurance, real estate and public utilities.
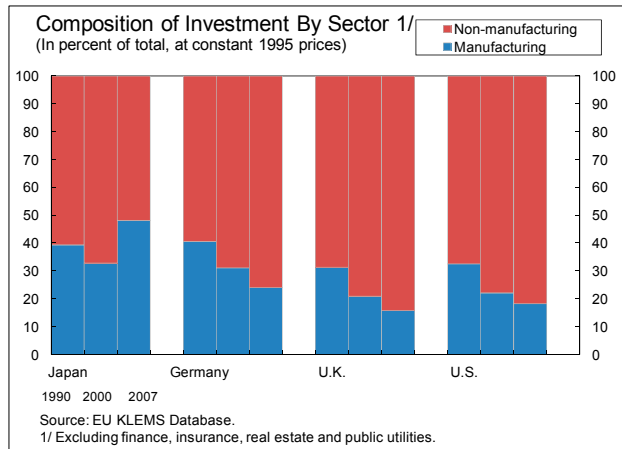
6.   **These divergent trends are mirrored in the relative strength of economic fundamentals of firms.**[2] In particular, profitability and liquidity indicators tend to be higher and leverage ratios lower for large firms and in the manufacturing sector. In the wake of Japan's banking crisis, these firms, especially exporters, restructured aggressively and enjoyed a long boom from 2003 to 2007. However, firms in more

Corporate Indicators
(2002-7, in percent)

Operating profits/Sales
CF/Sales
Debt-to-assets
Bank debt to total debt

Large Manufacturing   SME Manufacturing   Large Non-Manufacturing   SME Non-Manufacturing

Source: MOF Corporate Survey.
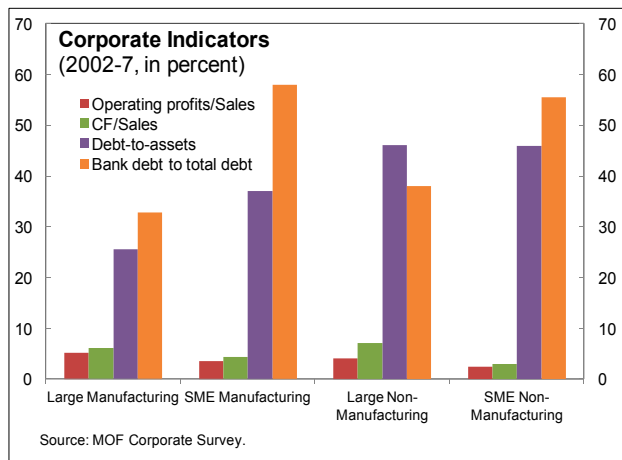
[2] For more details, see Bank of Japan (2003), Kang (2003), Komori (2004) and Steinberg (2009).

protected areas of the domestic economy—such as health, education, wholesale and retail trade, transport, and utilities—fell behind (Jones and Yoon, 2006).
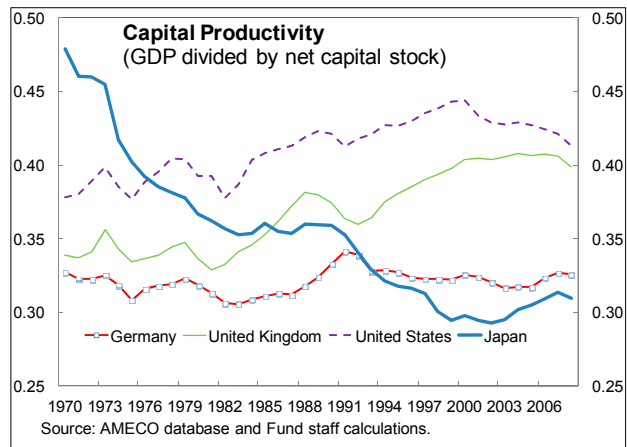
7.   **That said, corporate indicators also tend to be weak by international standards** (Table II.1). This difference is particularly large in the non-manufacturing sector and compared to U.S. and U.K. firms. Differences in capital structure are similarly stark, with Japanese firms tending to rely much more on debt (particularly bank) financing[3], and reliance on short-term financing increasing over time.

Table II.1. Non-Financial Corporate Indicators [1/]							
(In percent)							
	Manufacturing				Non-Manufacturing		
	Japan	Germany	U.K.	U.S.	Japan	Germany	U.K.	U.S.
Profitability								
Return on assets								
1990-97	2.45	3.75	7.37	6.34	2.42	4.09	6.50	6.51
2000-07	2.30	4.05	3.29	1.26	2.28	3.89	5.70	5.09
Liquidity								
Current ratio 2/								
1990-97	1.42	1.88	1.46	2.33	1.11	1.59	1.16	1.79
2000-07	1.51	1.79	1.58	2.18	1.01	1.65	1.04	1.47
Leverage								
Debt to equity								
1990-97	70.13	54.90	37.79	32.53	79.61	82.50	29.55	41.26
2000-07	44.23	43.25	26.16	20.85	68.48	79.83	48.49	33.00
Short-term debt to total debt								
1990-97	52.47	50.23	49.81	19.35	42.31	40.69	52.41	9.58
2000-07	60.86	44.49	41.69	25.70	48.04	32.73	31.36	14.34

Source: Corporate Vulnerability Utility Database and Fund staff calculations.
1/ Medians.
2/ Current assets to current liabilities.

8.   **At the same time, capital efficiency is relatively low, pointing to the need for more innovation.** The capital-intensity of the Japanese economy has been rising since the 1970s and is high compared to advanced economy peers. However, capital productivity has been on a trend decline and is now appreciably lower than in the United Kingdom and the United States. This suggests the need for more innovation and intangible investment to boost the efficiency of Japan's capital stock, including through R&D spending.

Capital Productivity
(GDP divided by net capital stock)

Germany — United Kingdom − − United States — Japan
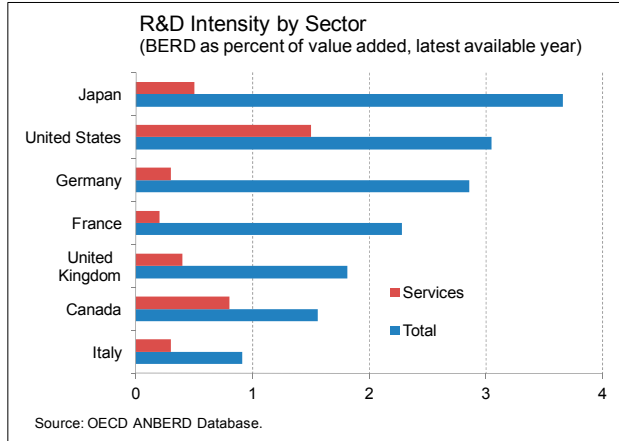Source: AMECO database and Fund staff calculations.

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[3] In Japan, bank lending accounts for around 50 percent of corporate financing, compared to around 15 percent in the United States, where stocks and corporate bonds dominate (60 percent) (BoJ, 2003).

9. **Japanese firms devote significant resources to R&D spending, but it is heavily skewed toward manufacturing and its impact generally low.** R&D spending as share of GDP is the third-highest in the OECD, but its benefits in terms of productivity growth have lagged over the last two decades (OECD, 2005; Brandstetter and Nakamura, 2003).[4] Possible factors include: the waning importance of process and incremental product innovation in which Japan has traditionally excelled and the lack of "radical product innovation" (Sakakibara and Tsujimoto, 2003); vertically integrated structures and weaknesses in areas in which collaboration with a broad range of organizations is critical,[5] such as services and software (Takeishi and Fujimoto, 2003); weak linkages between R&D sectors, i.e. universities, businesses and the public sector; a relatively low degree of openness to foreign investment; and the underdeveloped venture capital industry.[6] The low share of services in business R&D also stands out and may be contributing to low productivity in the sector—at 12 percent, it is the lowest in the OECD, compared to 43 percent in the United States and an OECD average of 25 percent.

R&D Intensity by Sector
(BERD as percent of value added, latest available year)

Source: OECD ANBERD Database.

10. **These cross-sectional differences in investment motivate the disaggregated nature of our empirical analysis.** The next section models what has been driving these trends in fixed capital and R&D spending in Japan using panel data, and the extent to which their determinants differ across firms and compared to other advanced economies.

C. Econometric Analysis: What Explains these Trends?

Empirical strategy

11. Using firm-level panel data on listed companies from the WorldScope database, we estimate the standard neoclassical investment model for fixed capital, and extend it to R&D for simplicity. The model relates investment to expectations of future profitability through

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[4] For instance, the Science Council of Japan estimates that R&D efficiency in life science, IT, environment, and nanotechnology is half that in the U.S. and major European countries.

[5] This stands in contrast to areas in which the scale of firms' internal resources and the closeness of their relations with regular business partners/suppliers are important, such as cars and domestic appliances, in which Japanese firms tend to be innovation leaders.

[6] Empirical evidence in the electronics, telecommunications, software and biotech industries suggest that entrants and small companies are more cost-effective producers of innovation and especially successful in introducing "disruptive" technologies that can give rise to new markets. In Japan, for example, there is evidence that younger and smaller companies tend to grow faster (Imai and Kawagoe, 2000).

Tobin's Q, and is augmented by some additional factors in line with the modern investment literature:

$$\Delta\left(\frac{I}{K}\right)_{it} \ or \ \ \Delta\left(\frac{RD}{C}\right)_{it} = c_t + b\Delta Q_{it} + c\Delta Z_{i,t} + \Delta\varepsilon_{it} \tag{1}$$

where the dependent variable is either I/K the ratio of fixed investment to the fixed capital stock or RD/C the ratio of R&D spending to its stock, Q is Tobin's Q[7], and Z a vector of additional variables, including the lagged dependent variable together with: (i) *cash flow* divided by capital, which measures the internal funds available to finance investment projects and is typically used in the literature as a proxy for financing constraints; (ii) *leverage*, measured by the debt-to-assets ratio, reflecting the effect of financial structure on investment; and (iii) the standard deviation of returns on the weekly stock price index to capture the potential negative impact of *uncertainty* on investment.[8]

12.   **The models are estimated using a GMM approach,** to allow for endogeneity and measurement error in the dependent variables. Estimations are conducted in first -differences and included year dummies, to control for firm-and time-specific effects. This approach yields consistent estimates provided there is no higher order serial correlation in the residuals and the instruments are valid.[9] Diagnostic tests are used to verify these conditions.[10]

Results

Fixed Investment

13.   **The empirical model confirms the importance of economic fundamentals for fixed investment.** Estimating equation (1) on our full sample, we find (Table II.A.1)**:**

- *Profitability.* Investment is positively associated with expectations of future profitability, as summarized by Tobin's Q, with an implied elasticity (estimated at the means of the sample) of 0.2.

- *Leverage and uncertainty.* Investment is negatively associated with leverage and uncertainty, with implied elasticities of -0.4 and -0.2, respectively.

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[7] Defined as the ratio of the stock market valuation of the firm to the replacement cost of its capital stock.

[8] This is consistent with the "real options" literature emphasize the role of risk, with greater uncertainty providing an incentive to delay investment (Dixit and Pindyck, 1994).

[9] The instruments reported are lagged values of the dependent variable and our regressors, but results were robust to using alternative instrument sets.
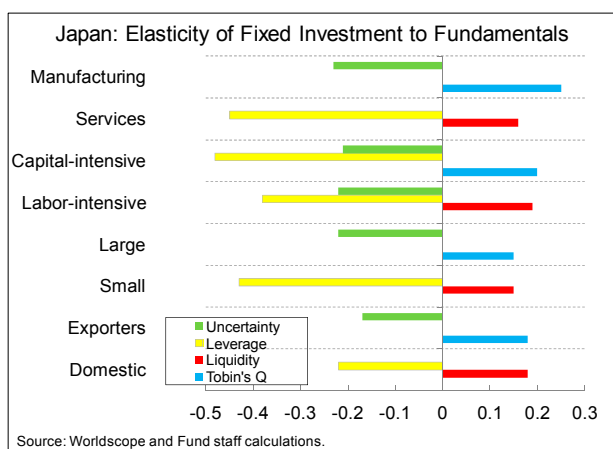
[10] Models are assessed based on tests for serial correlation (m1 and m2) and instrument validity (Hansen).

- *Cash flow.* The coefficient on cash flow is positive but insignificant, suggesting that the average listed firm in Japan is not financially constrained, consistent with the large excess cash holdings typically observed at large firms.

14. **The determinants of investment have changed over time.** Declining investment rates during the early part of our sample seem to mainly reflect diminished profit expectations. In particular, we find no evidence of any association with cash flow or leverage ratios. While this may reflect large standard errors due to the smaller size of the sub sample, the magnitude of the coefficients is also very different from that in the 2000s. These findings are consistent with the hypothesis that low demand for investment due to declining profitability was the key constraint during the 1990s.[11] By contrast, the stronger relationships observed between investment, leverage and uncertainty in the full sample seem to reflect the behavior of Japanese companies during the more recent period.

15. **Factors driving investment also differ significantly based on firm characteristics—including size, sector, overseas exposure, and capital intensity:**

- *Large firms.* For larger firms, manufacturers, exporters, and those using capital-intensive technology, profit expectations and uncertainty have powerful effects on investment. This may reflect their greater exposure to international competition, as well as to fluctuations in domestic and overseas macroeconomic conditions.

Japan: Elasticity of Fixed Investment to Fundamentals

Source: Worldscope and Fund staff calculations.

- *SMEs.* By contrast, for smaller firms, service providers[12], non-exporters, and those utilizing labor-intensive technology, investment is more sensitive to cash flow. This cross-sectional variation in the coefficient on cash flow supports its interpretation as an indicator of financing constraints.[13]

- *Leverage.* Despite progress with corporate restructuring, a legacy of excess leverage and dependence on debt financing continues to hold back investment for the smaller group of firms. In splitting the sample by debt reliance and the magnitude of Tobin's

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[11] This is consistent with the hypothesis in Hayashi and Prescott (2002), among others.

[12] This includes medical and healthcare, wholesale and retail trade, construction, power supply, transport, and telecommunications.

[13] Similar results were obtained in dividing the sample by the age of the firm, with younger firms found to be financially constrained.

Q, we found this effect to be concentrated in those firms with a high debt and low profitability, suggesting threshold effects.

16.   **The economic significance of these effects appears large.** The estimated elasticities suggest: [14]

- *Large firms.* A 10 percent increase in expected profitability or a 10 percent decline in uncertainty could increase real investment of large firms by 1½ and 2 percent, respectively.

- *SMEs.* A 10 percent improvement in access to external financing or a 10 percent decline in leverage could increase SME investment in real terms by 1½ and 4 percent, respectively.

- *Manufacturing.* A 10 percent increase in expected profitability or a 10 percent decline in uncertainty could both increase manufacturing investment by 2½ percent in real terms.

- *Services.* A 10 percent improvement in access to external financing or a 10 percent decline in leverage could increase real investment in the service sector by 1½ and 4 percent, respectively.

17.   **A cross-country analysis shows that while the behavior of German firms is qualitatively similar to Japan, the determinants of investment in the United Kingdom and the United States are markedly different** (Table II.A.1). The significant impact of profit expectations and uncertainly on investment by larger firms and those in the export sector is also observed in these other advanced economies. Apart from this, however, there are few similarities between Japan and Germany on the one hand and the United States and the United Kingdom on the other. Operating in a similar bank-centric environment, German firms display much the same cross-sectional pattern in financing constraints. However, there is little evidence of such constraints or detrimental effects of debt financing in the case of U.S. and U.K. firms in recent years, perhaps reflecting abundant liquidity leading up to the current crisis as well as more diverse sources of corporate funding for small companies (beyond bank lending).

R&D Spending

18.   **Intangible investment is also driven by economic fundamentals, although estimated impacts are somewhat smaller than for fixed investment.** Estimating equation (1) on our full sample of R&D investing firms yielded the following results (Table II.A.2):

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[14] The 10 percent shocks considered below correspond to standard deviation shifts of: (i) a one-tenth for Tobin's, cash flow, and leverage; and (ii) one-third for uncertainty.

- *Profitability.* R&D spending is positively associated with expectations of future profitability, as summarized by Tobin's Q, with an implied elasticity of around 0.1.

- *Leverage.* R&D spending is negatively associated with leverage, with an implied elasticity of -0.2.

- *Cash flow and uncertainty.* The coefficient on cash flow is positive but insignificant, much like in our full sample for fixed investment, as is that on uncertainty. Together with the lower implied elasticities on Tobin's Q and leverage, this could reflect the fact that R&D spending typically involves significant sunk and adjustment costs, which tend to make it less sensitive to shocks that are perceived to be short-lived (see, for example, Bond and others, 2003). A priori, however, since investment in intangible assets tends to be riskier and harder to collateralize, such spending may be more prone to financing constraints and we explore this further in our sample splits.

19.   **Again, we detected a dichotomy between firms and economically significant effects:**

- *Large firms.* For larger firms, manufacturers and exporters, R&D spending is driven by profit expectations and not affected by cash flow or financing structure. In addition, uncertainty tends to dampen such spending by large firms.

Japan: Elasticity of R&D Spending to Fundamentals

Source: Worldscope and Fund staff calculations.

- *SMEs.* By contrast, for smaller, service sector, and non-exporting firms, financing constraints hinder R&D spending, and, by extension, innovation.

- *Leverage.* The effect of financing structure was less pervasive than for fixed investment. However, reliance on debt financing does hold back R&D spending in services, suggesting that greater equity financing could spur innovation within this sector.
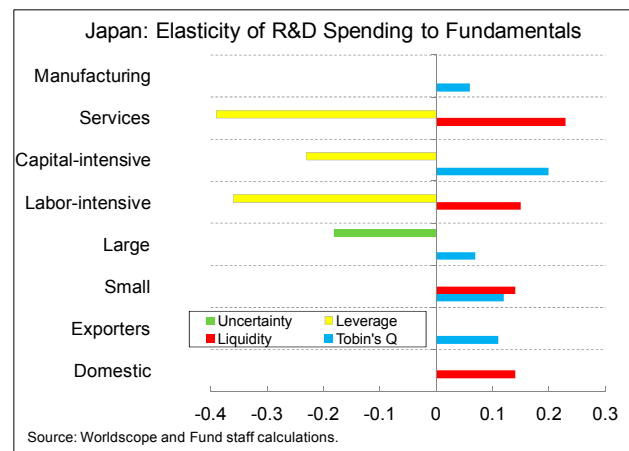
D. Policy Implications

20.   **As labor input shrinks with population aging, capital accumulation and productivity gains will drive growth over the medium-term**. What policies could be adopted to help firms adjust to the imperatives of the post-crisis global economy? Our results suggest that underlying strategies for supporting investment and innovation will differ depending on firm characteristics and sectors. As discussed below, policies could usefully focus on four areas: (i) increasing the return on investment; (ii) strengthening risk

management to reduce uncertainty; (iii) improving access to external financing to reduce the cost of capital, especially for smaller and domestically-oriented firms; and (iv) reducing excess leverage and promoting SME restructuring to create space for new investment.

21.   **First, raising the rate of return on investment will be important**. The tax code is an obvious candidate, since taxes raise the bar for investment to be profitable and fall especially hard on capital-intensive industries. Moreover, tax reforms have been shown to have significant effects on investment in advanced economies (Cummins, Hassett, and Hubbard, 1995).

- *Reducing the corporate tax rate.* In addition to the headline statutory rate of corporate tax, which at 40 percent is the highest in the OECD, the average and marginal effective rates (AER and MER) are important in determining the location and level of investment, respectively.[15] Japan also has the highest AER and the second-highest MER on equity-finance investments. Reducing the corporate tax rate may, therefore, be an effective strategy for reducing distortions and boosting both domestic and foreign investment in Japan.

Effective Corporate Tax Rates in OECD (In percent)

Source: Institute for Fiscal Studies and staff estimates.
[1] Plant and machinery, equity financed.

Source: Institute for Fiscal Studies, 2005.
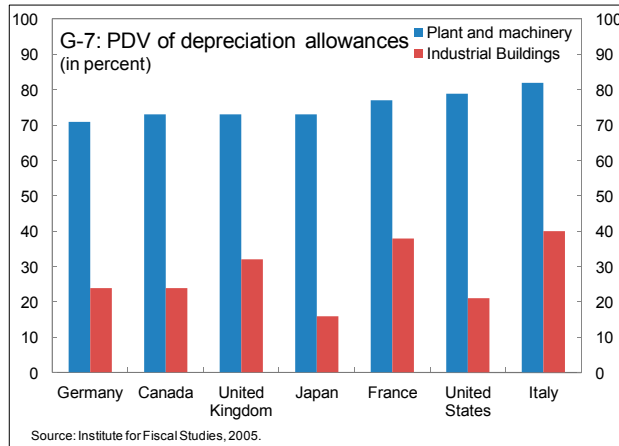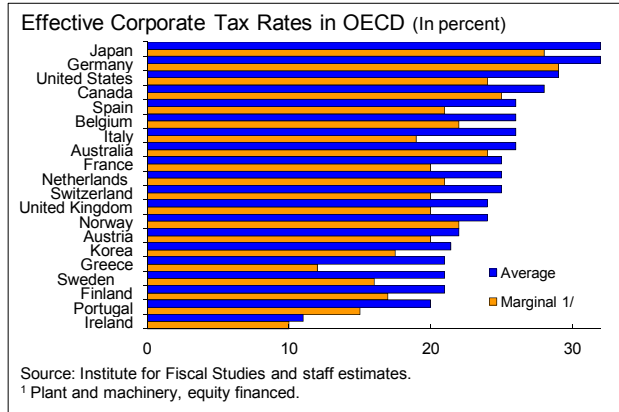
- *Accelerating depreciation allowances for industrial buildings*, which are the lowest among the G-7 economies. While the new depreciation rules enacted in 2007 place Japan ahead of most other G-7 countries in terms of the generosity of the depreciation system for machinery, the treatment of buildings is less generous (see Dalsgaard, 2008). Buildings are subject to straight line depreciation only, with a much

| (Years)	Carry Forward	Carry Back
Australia	Indefinite	0
Canada	10	3
Japan	7	1
Netherlands	Indefinite	3
New Zealand	Indefinite	0
Spain	15	0
United Kingdom	Indefinite	1
United States	20	2

Source: Australian Treasury.

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[15] The average effective rate is the proportion of lifetime pre-tax profit that is taken in tax, while the marginal effective tax rate is the difference between the before- and after-tax returns on a project that an investor finds just worthwhile.

longer useful tax life longer than elsewhere (50 years against e.g. 39 years in the United States).

- *Extending corporate tax-loss carry forwards* could help firms recoup some of the losses incurred in the early years of large investments may also help—Japan currently allows for a 7 year carry forward period, compared to 20 years in the United States.

- *Increasing tax credits or targeted public spending*, such as the support of research programs by the government in Germany, could help spur more innovation (see, for example, Bloom, Griffith, and Van Reenen, 2002). At 10 and 20 cents per dollar of R&D spending for large firms and SMEs, respectively, tax subsidies are low in Japan compared to some other advanced economies.

G-7: R&D Tax subsidy rate
(per $ of R&D Spending)

Source: OECD.
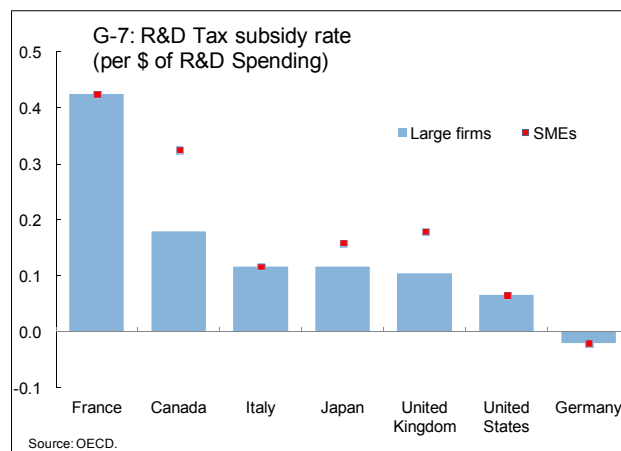
22.   **Second, reducing uncertainty would help lower the risks associated with long-term investment decisions**. Investment decisions can be affected by uncertainty about many, potentially exogenous, aspects of their operating environment—such as demand, prices, costs, and exchange rates—as well as risk related to policies. Potential options include:

- *Promoting the use of financial instruments to manage risks.* International comparisons suggest that while large exporters in Japan engage in significant hedging activity they tend to under-insure against credit, commodity and marketable security price risk. By contrast, SMEs undertake much less hedging, including of exchange rate and interest rate risk (Heaney and others, 1999, and Bartram and others, 2003).

- *Further improvements to the business climate.* International surveys of investor perceptions suggest that a more streamlined process for business creation[16], more labor market flexibility[17], and improved legal and regulatory framework for entrepreneurs and bankruptcy could help reduce investor perceptions of risk in Japan.

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[16] According to the World Bank's *Doing Business 2010*, Japan ranks 23rd out of 27 OECD countries in terms of starting a new company due to the number, time and cost of procedures.

[17] Japan is ranked tenth in employment protection in the OECD (OECD, 2006) and first among major industrial countries in the difficulty of dismissing workers (World Bank, 2009).

23. **Third, improving access to external financing would lower the cost of capital for smaller firms and those in the service sector.** Problems faced by SMEs in accessing financing typically reflect an incomplete range of financial products, regulatory rigidities, gaps in the legal framework, or information asymmetries between financers and firms. These problems are especially acute for start-ups, which represent an important source of innovation and will become even more important as production processes are revamped in response to a changed post-crisis global landscape. However, business creation in Japan is low[18] and the venture capital industry still in an early stage of development—Japan ranks second last in the OECD in venture capital investment as a share of GDP.[19] Investors are also skewed toward banks and other financial institutions, with pension funds playing a much more limited role, unlike in the United States and Europe. This make-up may bias venture capital toward late-stage development rather than seed and start-up companies (Mayer, Schoors, and Yafeh, 2005) and toward shorter-term investments. In addition, less than a third of venture capital investments is directed toward leading science-based sectors—such as communications, IT and biotechnology—compared to 90 percent in the United States. Policy options include:
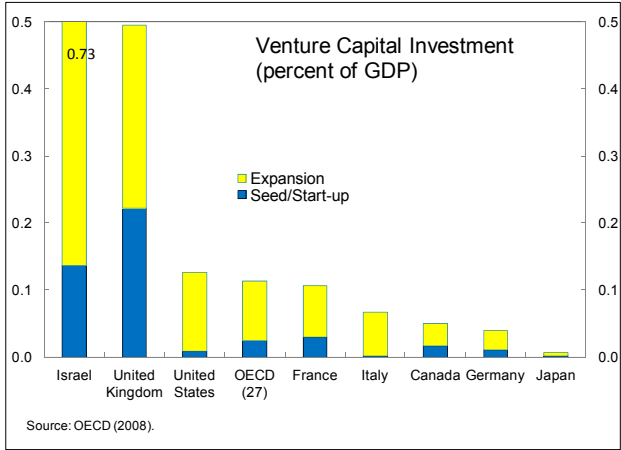
- *Widening the pool of venture capital funding available for start-ups in new emerging sectors,* (OECD, 2006b). Targeted tax breaks or allocating a larger share of the public pension funds to venture capital investments could support the industry.[20] Providing greater information to potential institutional investors through a

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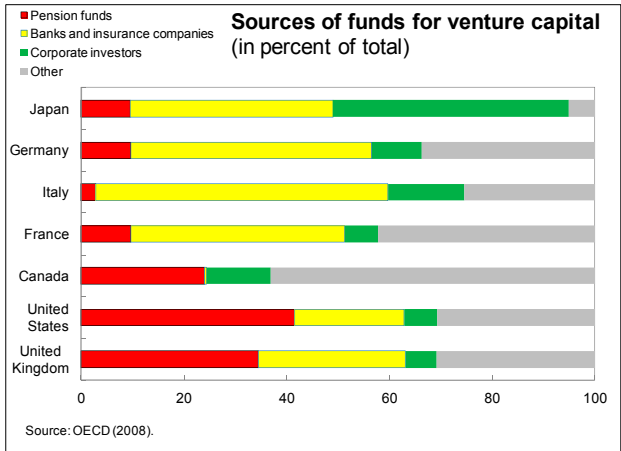
[18] Possible impediments include government regulations and credit market imperfections (see Mukoyama, 2009).

[19] At 5.1 percent, the opening rate is lower than the 6.2 percent closing rate and the more than 10 percent opening rates in France, United Kingdom, and the United States.

[20] Presently, the GPIF does not undertake any alternative investments such as venture capital, real estate and private equity. By contrast, a number of OECD countries allocate some share of their assets to such investments, including CalPERS (14 percent), New Zealand Superannuation Fund (11 percent), Government of Singapore Investment Corporation (11 percent), and Korea National Pension Service Fund (2.5 percent).

database documenting investment performance records of venture firms[21] and development of performance benchmarks on emerging equity exchanges (such as JASDAQ) could draw in more investment.

- *Broadening eligible collateral* to allow for a wider range of securitization beyond real estate and fixed asset, including intellectual property rights and receivables. The authorities are already moving in this direction of promoting asset-based lending—the Credit Guarantee Corporation and Japan Finance Corporation have initiated a program accepting inventories and accounts receivables as collateral since 2007.

- *Greater risk-based lending.* Banks traditionally rely heavily on collateral or relationship lending to guide their credit decisions, which can undermine financial intermediation.[22] A broader sharing of borrower's credit information and developing private institutions for credit insurance could strengthen banks' risk management and expand risk-based lending.

24.   **Fourth, reducing leverage and improving incentives for corporate restructuring will help create space for new investment.**

- *As the recovery firms, restructuring could be promoted by phasing out credit guarantees.* Significant progress has been made on corporate and financial restructuring over the last decade, but smaller companies have tended to fall behind. This partly reflects the still-sizable credit guarantees for SMEs, which can limit their incentives for restructuring and create an entry barrier by making it difficult for many newer firms to access bank credit (McKinsey Global Institute, 2000).[23]

- *Assisting the exit of nonviable companies, through out-of-court workouts and further reforms to streamline bankruptcy procedures.*[24] Combined with reforms to the public support system, these measures could jumpstart a market for private-led restructuring

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[21] In the United States and Europe, VentureOne and Thomson Financial store information on start-ups—including profitability and investment flows—regularly used by venture capitalists and institutional investors.

[22] According to the OECD, cross share-holding has limited risk-taking, while the rise in the share of loans by public financial institutions (15 percent in early 1990s to 20 percent) may have hindered the development of capital market to supply risk money and prevented the exit of less competitive firms. According to the BoJ's March 2010 *Financial Systems Report*, firms with strong capital ties to banks have tended to underperform in terms of profitability and liquidity indicators.

[23] Uesugi, Sakai, and Yamashiro (2006) suggest that credit guarantees can lead to a significant increase in leverage and do not translate into efficiency gains in the case of high-risk firms.

[24] Over the longer term, attention should shift away from relying on guarantees to addressing the root cause of SMEs' limited access to credit—research suggests that improvements in the financial infrastructure can improve credit availability, including by expanding credit information sharing, allowing the securitization of movable assets, and developing venture capital markets for SMEs (Beck and Demirgüç-Kunt, 2006).

of distressed SMEs, similar to what took place for large enterprises after
Japan's 1990s banking crisis.

- *Facilitate FDI to increase equity financing, promote links with global production networks and enable technology transfer.* FDI flows into Japan are currently very low, limiting opportunities to gain access to new technologies especially for SMEs, particularly in the services sector.

FDI flows
(2002-7, in percent of GDP)

Source: WEO and Fund staff calculations.
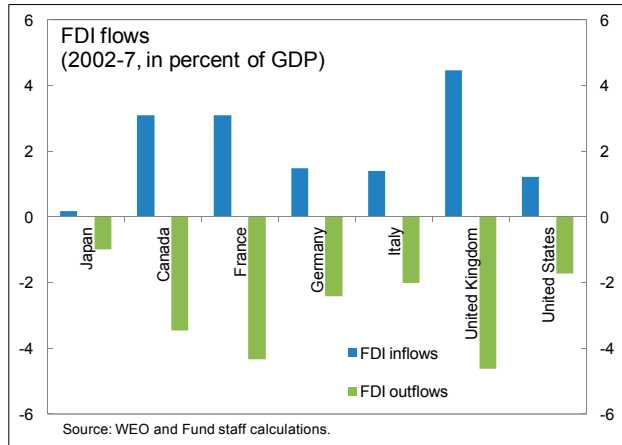
E. Conclusion

25.   **In Japan, public policies can help create an environment for more effective capital formation.** A shrinking domestic labor force places an onus on capital accumulation and innovation to ensure robust growth over the medium-term. At the same time, a changing global landscape calls for a shift in export-oriented investment toward new markets and a new generation of products, as well as increased investment by domestically-oriented firms. To support this transition, policies could usefully focus on four broad areas. First, raising the return on investment, including through reforms to the tax code. Second, decreasing uncertainty through improved risk management by firms and by bolstering the business climate. Third, improving SME access to finance, notably by encouraging venture capital investment in innovative areas and more risk-based lending. And fourth, reducing excess leverage and supporting SME restructuring to enable new investments to flourish. Such reforms would not only strengthen the growth foundations of the Japanese economy but also help capitalize on changes taking place in the global environment.

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Table II.A.1. Japan and Other Advanced Economies: Determinants of Fixed Investment [1,2]

	Full Sample	Time period		Size		Market exposure		Factor intensity		Sector	
		1990s	2000s	Big	Small	Exporters	Domestic	Capital	Labor	Manufacturing	Services
						JAPAN					
Tobin's Q	0.007**	0.017**	0.005*	0.007**	0.004	0.008**	0.005	0.010**	0.004	0.012**	0.002
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Liquidity 3/	0.012	-0.179	0.045	-0.046	0.089*	-0.012	0.103*	-0.019	0.103**	0.021	0.092*
	(0.04)	(0.13)	(0.04)	(0.05)	(0.06)	(0.04)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)
Leverage 4/	-0.002**	0.000	-0.002**	-0.001	-0.002**	-0.001	-0.001*	-0.002**	-0.002**	-0.001	-0.002**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Uncertainty 5/	-0.062**	-0.033	-0.063**	-0.064**	-0.057	-0.054*	-0.011	-0.088**	-0.064**	-0.070**	-0.024
	(0.03)	(0.09)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
				(p-value of specification tests)							
m1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
m2	0.196	0.520	0.150	0.211	0.220	0.120	0.165	0.734	0.207	0.796	0.201
Hansen-test	0.189	0.344	0.267	0.185	0.625	0.131	0.852	0.322	0.271	0.152	0.916
Number of firms	2695	356	2529	1244	1553	1014	1681	1371	1395	1635	1060
Number of observations	10649	1256	9393	5298	4590	5102	5547	4869	4465	7029	3620
						GERMANY					
Tobin's Q	0.011**	0.006**	0.014**	.009*	.014**	0.005	0.022**	0.026**	0.021**	0.006**	0.023**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Liquidity 3/	0.022	-0.027	0.029*	-0.019	0.034*	-0.006	0.038*	-0.039	0.035*	0.037	0.034**
	(0.02)	(0.10)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Leverage 4/	-0.001	-0.002	-0.001	-0.000	-0.002*	-0.000	-0.002	0.002	-0.004**	0.001	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Uncertainty 5/	0.018	-0.002	0.033	-0.103**	0.055	-0.084*	0.035	-0.091*	0.103	0.077	0.031
	(0.06)	(0.22)	(0.07)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.08)	(0.09)	(0.05)
				(p-value of specification tests)							
m1	0.000	0.007	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.004	0.001
m2	0.103	0.354	0.150	0.264	0.163	0.194	0.175	0.316	0.876	0.203	0.128
Hansen-test	0.532	0.623	0.677	0.584	0.265	0.642	0.695	0.578	0.705	0.639	0.136
Number of firms	717	330	634	336	437	484	233	375	170	395	322
Number of observations	4548	1453	3095	2258	1978	3490	1058	2078	678	2852	1696
						UNITED KINGDOM					
Tobin's Q	0.010**	0.011	0.010**	0.008**	0.015**	0.007**	0.015**	0.028**	0.013**	0.007*	0.013**
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Liquidity 3/	0.000	0.070**	-(0.01)	-0.011	0.014	0.005	0.028	0.044	-0.018	0.019	-0.031
	(0.02)	(0.03)	0.023	(0.02)	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.03)
Leverage 4/	0.000	-0.000	0.001	-0.000	-0.001	-0.001	-0.001	0.000	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Uncertainty 5/	-0.102**	-0.034	-0.129**	-0.135**	-0.069*	-0.058	-0.106*	-0.106**	-0.131**	-0.082**	-0.087*
	(0.05)	(0.05)	(0.06)	(0.05)	(0.04)	(0.05)	(0.06)	(0.06)	(0.06)	(0.04)	(0.05)
				(p-value of specification tests)							
m1	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
m2	0.148	0.165	0.546	0.187	0.166	0.149	0.152	0.201	0.090	0.199	0.194
Hansen-test	0.548	0.425	0.858	0.327	0.672	0.312	0.163	0.688	0.210	0.402	0.443
Number of firms	1664	1035	1197	792	1000	1224	440	906	982	672	992
Number of observations	10530	4629	5901	5152	4693	8507	2203	4746	4563	4716	5814
						UNITED STATES					
Tobin's Q	0.010**	0.015*	0.010**	0.008**	0.010**	0.004*	0.020**	0.009**	0.008**	0.013**	0.011**
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Liquidity 3/	0.016	0.037	0.016	-0.011	0.008	0.009	-0.006	0.019	0.005	-0.003	0.006
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Leverage 4/	0.001	0.002	0.002*	0.000	0.001	-0.000	0.001	-0.001	-0.000	-0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Uncertainty 5/	-0.029	-0.289	-0.032	-0.068*	-0.036	-0.062**	-0.076	-0.056*	0.011	-0.095**	-0.046
	(0.03)	(0.18)	(0.03)	(0.04)	(0.04)	(0.03)	(0.07)	(0.03)	(0.04)	(0.05)	(0.04)
				(p-value of specification tests)							
m1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
m2	0.112	0.346	0.128	0.929	0.277	0.148	0.336	0.355	0.231	0.177	0.164
Hansen-test	0.141	0.267	0.335	0.225	0.332	0.171	0.375	0.633	0.433	0.207	0.499
Number of firms	5252	2656	4295	2281	3263	3073	2179	2726	2797	2542	2710
Number of observations	29039	9370	19669	14640	12493	18621	10418	13248	12593	15418	13621

Source: Worldscope and Fund staff calculations.
1/ First-differenced GMM specifications, with lagged dependent variable and year dummies. Instruments are lagged values of regressors.
2/ Robust t-statistics in parentheses, with * indicating significance at 10 percent and ** at 5 percent level.
3/ Cash flow to capital.
4/ Debt-to-assets.
5/ Standard deviation of return on weekly price index (annualized).

Table II.A.2. Japan: Determinants of R&D Spending [1/ 2/]

	Full Sample	Size		Market exposure		Factor intensity		Sector	
		Big	Small	Exporters	Domestic	Capital	Labor	Manufacturing	Services
Tobin's Q	0.003*	0.003*	0.005**	0.005**	0.003	0.010**	0.003	0.003*	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Liquidity 3/	0.003	-0.024	0.082**	0.004	0.077*	0.007	0.080**	-0.011	0.108**
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.06)	(0.04)	(0.03)	(0.04)
Leverage 4/	-0.001*	-0.000	0.000	-0.001	0.000	-0.001**	-0.002**	0.000	-0.002**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Uncertainty 5/	0.027	-0.057**	0.003	0.037	0.029	-0.039	-0.039	0.031	-0.002
	(0.02)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)
				(p-value of specification tests)					
m1	0.000	0.000	0.001	0.004	0.001	0.000	0.000	0.025	0.022
m2	0.779	0.190	0.984	0.480	0.324	0.079	0.152	0.295	0.502
Hansen-test	0.340	0.352	0.708	0.123	0.963	0.414	0.755	0.101	0.976
Number of firms	1804	824	1019	890	914	906	931	1412	392
Number of observations	6558	3283	2735	3935	2623	2988	2853	5381	1177

Source: Worldscope and Fund staff calculations.

1/ First-differenced GMM specifications, with lagged dependent variable and year dummies. Instruments are lagged values of regressors.
2/ Robust t-statistics in parentheses, with * indicating significance at 10 percent and ** at 5 percent level.
3/ Cash flow to capital.
4/ Debt-to-assets.
5/ Standard deviation of return on weekly price index (annualized).

III. BOOSTING PRIVATE CONSUMPTION IN JAPAN[1]

A. Introduction

1.   **As part of a strategy for addressing pressures from an aging society and supporting needed fiscal consolidation, this chapter focuses on ways to boost private consumption in Japan.** Private consumption is the largest component in GDP, but its growth has stagnated since the late 1990s. The key to reviving consumption is boosting household disposable income through higher wages, especially in services, and higher returns on savings. The next sections revisit the stylized facts on private consumption, examine drivers to spending, and conclude with possible policy options.

### B. Stylized Facts of Private Consumption

2.   **Compared to G-7 countries, Japan's private consumption share in GDP is low.** Japan's consumption share in GDP rose steadily from 53 percent in 1990 before peaking in 2002 at around 57 percent (Figure III.1). During the recent expansion phase (2003–07) the share fell slightly, with consumption growing at 5 percent compared to 10 percent for GDP. As of 2007, Japan's consumption share was 4 percentage points below that of other G-7 countries, suggesting room for raising private consumption growth.

Figure III.1. Private Consumption and Household Disposable Income
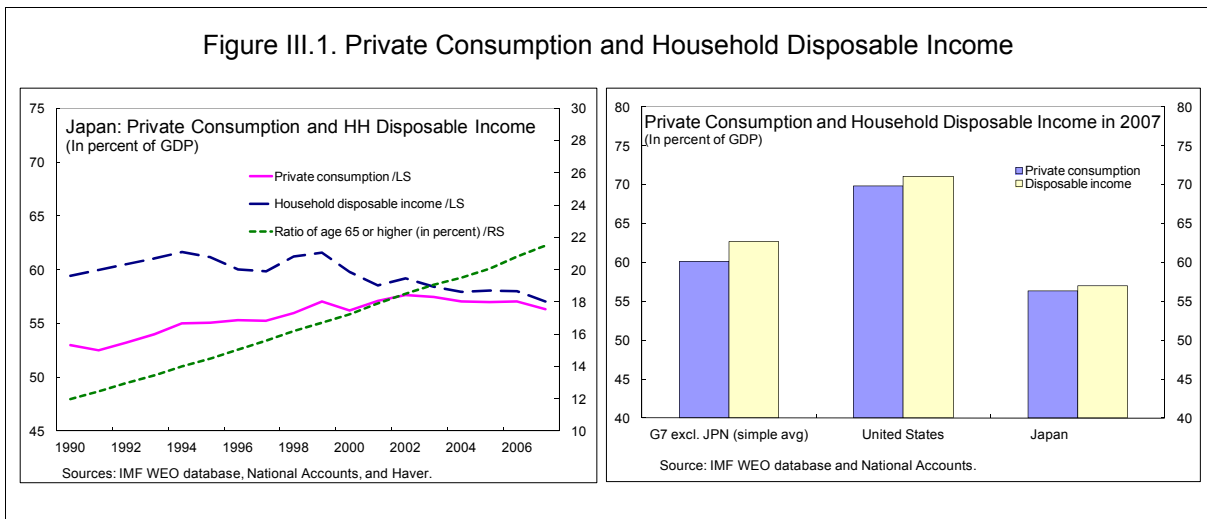
3.   **Sluggish consumption is not the result of rising household savings.** To the contrary, the (aggregate) household saving rate has declined steadily since the early 1990s to around 2 percent in 2008 (Figure III.2), reflecting mainly population aging. Even for younger households, who might be expected to save more with a weak economy, saving has not

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[1] Prepared by Kiichi Tokuoka.

increased since the early 2000s. The saving rates for those 30–39 years of age and below have remained stable, suggesting that saving is not contributing much to the stagnant consumption.

Figure III.2. Household Saving Rate
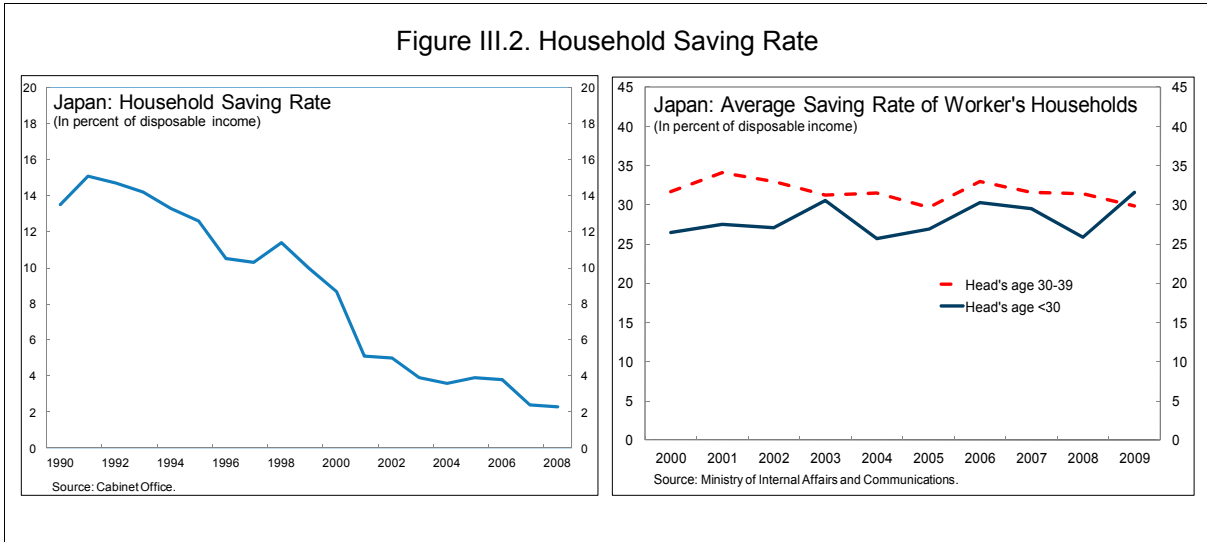
4.   **Rather, private consumption has been closely tracking trends in household disposable income.** Standard time series regressions confirm that at the aggregate level, Japan's private consumption (share) is positively related to (cointegrated with) household disposable income and the old-age population ratio (Table III.1). The positive coefficient on the old-age population ratio is consistent with a prediction of a standard life-cycle model. In the regressions, output gap,[2] the short-term interest rate, and CPI inflation are included as control variables (the latter two are in an alternative specification (second column in Table III.1).[3] Similar to Japan's time series regression, the results for a G-7 panel regression also find a significant positive impact of household disposable income on consumption.

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[2] According to a standard representative agent model, consumption (level) responds only modestly to output gap (level) because a temporary shift in output has a limited impact on lifetime income that determines consumption. Such a response implies a negative correlation between the consumption share in GDP and output gap.

[3] As discussed in Edison (2005), CPI inflation could affect consumption independently from its influence via the real interest rate. For example, CPI inflation could capture the effect of uncertainty.

|	Japan [3/]		G-7 Panel [4/]	
Dependent variable: Private consumption (in percent of GDP)				
Household disposable income	0.288**	0.276**	0.284***	0.282***
(in percent of GDP)	(0.136)	(0.123)	(0.0649)	(0.0675)
Age>64	0.559***	0.539***	-0.0729	-0.0728
(in percent of total population)	(0.0676)	(0.0912)	(0.233)	(0.235)
Output gap	-0.237***	-0.265***	-0.117**	-0.123**
	(0.0747)	(0.0676)	(0.0531)	(0.0587)
Short-term interest rate		0.105		0.0163
		(0.0917)		(0.0473)
CPI inflation		-0.263**		-0.0111
		(0.0942)		(0.0613)
Constant	29.30***	30.25***		
	(9.093)	(8.587)		
Year dummy	No	No	Yes	Yes
Num of Observations	26	26	134	134
R^2	0.924	0.949	0.470	0.470

Table III.1. Japan: Regression Results [1, 2/]

Sources: OECD, IMF WEO database, and National Accounts.
1/ Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
2/ The sample period is 1980-2005 except for missing observations.
3/ Regression with level variables. All the variables expect for output gap and CPI growth are assumed to be cointegrated.
4/ G-7 panel regressions are conducted by taking first differences because most of the variables are assumed to follow a unit-root process.

C. Drivers of Private Consumption

5.   **The main components of household disposable income—wages and property income—have stagnated in Japan.** Wages declined by 3 percent between 2000–07 in nominal terms, while household property income fell 14 percent during this period. Credit and equity financing can also support consumption, but these remain limited in Japan.

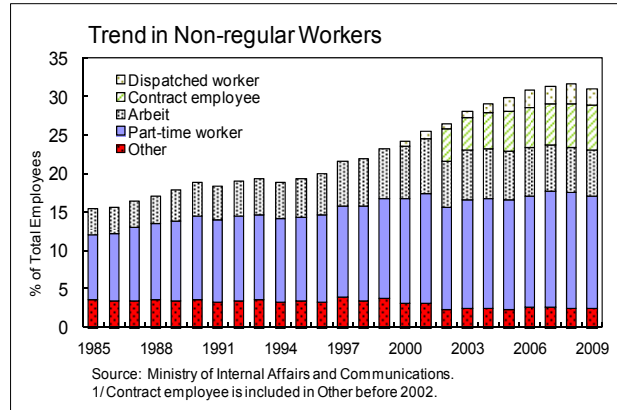*Wages*

6.   **Sluggish wages reflect both global and Japan-specific factors.** The share of wages in GDP has fallen from 47 percent in 1995 to 44 percent in 2007 owing to both global and Japan specific factors (Sommer, 2009). The key global factors may include technological changes, such as

Wages and Salaries (In percent of GDP)

Source: National Accounts.
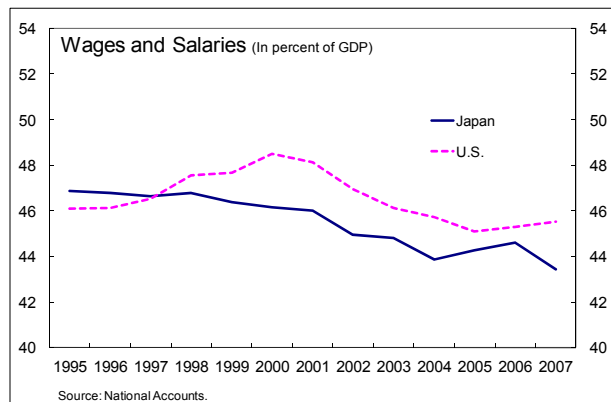
greater use of information technology that reduce demand for low-skilled workers, and globalization pressures that push firms to be more sensitive to international wages. The large gap in productivity growth between the services and manufacturing sectors may also have depressed overall wage growth, given productivity's link to wages. [4]

7.   **The increasing share of nonregular workers may also have played a role in depressing wages (Sommer, 2009).** Deregulation measures in the 1990s that expanded the list of industries contributed to an increase in the share of nonregular workers to 30 percent in 2009 from 15 percent in 1995. This may have put downward pressures on aggregate wages. In addition, strong employment protection for regular workers may have limited competition and productivity growth, holding back wages.

Trend in Non-regular Workers

Source: Ministry of Internal Affairs and Communications.
1/ Contract employee is included in Other before 2002.

Property Income

8.   **After Japan's asset bubble collapse around 1990, household property income steadily declined (Figure III.3).** The declining share of household property income was led by the fall in both interest and dividend income following the economic slump of the 1990s. Household property income recovered in the early 2000s along with the economic rebound, but remained low at only about 4 percent of household disposable income in 2007, compared with 20 percent in the United States (U.S.) and well below that of other G-7 economies.

Figure III.3. Household Property Income

Japan: Household Property Income
(In percent of household disposable income)
Source: Cabinet office.

Household Property Income in 2007
(In percent of household disposable income)
Source: National Accounts.

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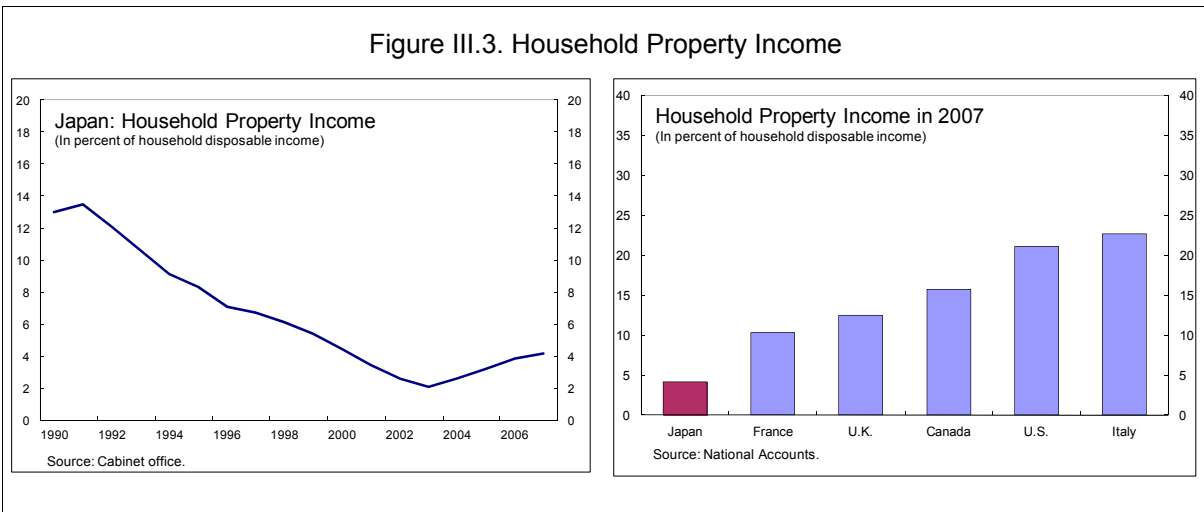
[4] Morikawa (2006) presents evidence that productivity growth in the manufacturing sector has tended to be higher than that in the services sector across advanced economies.

9.   **A key reason for low property income in Japan is the small share of risky assets in household's balance sheets.** At the aggregate level, risky assets (shares, equities, and trusts) account for only 10 percent of the overall financial assets in Japan—significantly lower than the 40 percent share in the U.S. Micro data point to a similar pattern, with households in the U.S. holding more risky assets than in Japan at all ages (Figure III.4). In Japan, the high share of deposits and currency, which account for nearly 60 percent of financial assets and earn a low rate of returns over the past decade (typically less than 0.5 percent), have depressed property income.
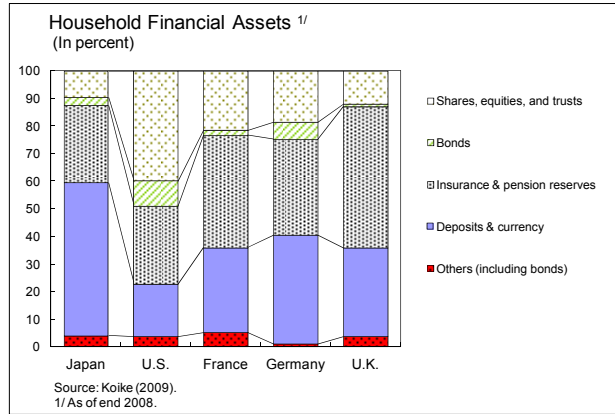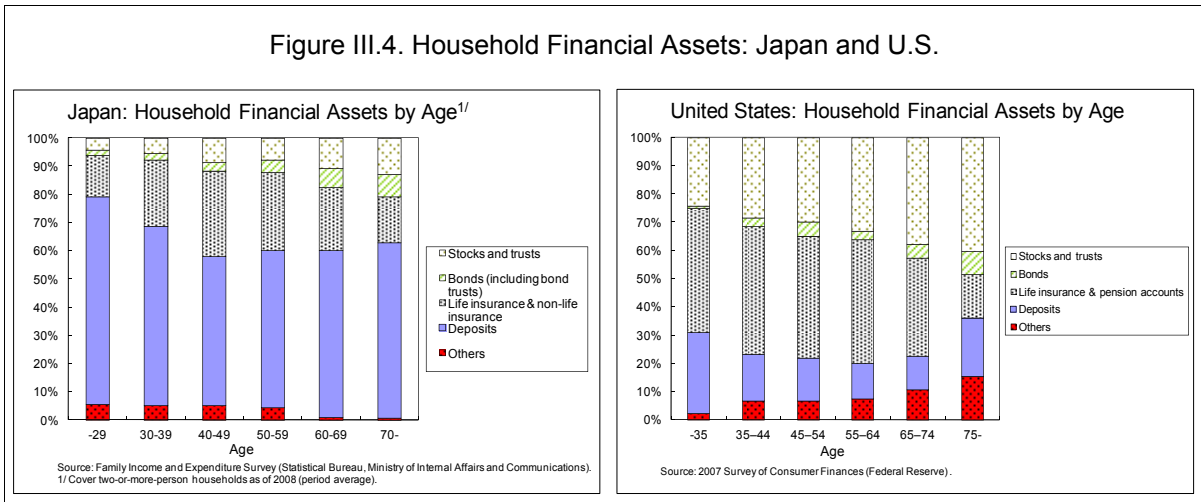

Household Financial Assets [1/]
(In percent)

Shares, equities, and trusts
Bonds
Insurance & pension reserves
Deposits & currency
Others (including bonds)

Source: Koike (2009).
1/ As of end 2008.

Figure III.4. Household Financial Assets: Japan and U.S.

Japan: Household Financial Assets by Age[1/]

Stocks and trusts
Bonds (including bond trusts)
Life insurance & non-life insurance
Deposits
Others

Source: Family Income and Expenditure Survey (Statistical Bureau, Ministry of Internal Affairs and Communications).
1/ Cover two-or-more-person households as of 2008 (period average).

United States: Household Financial Assets by Age

Stocks and trusts
Bonds
Life insurance & pension accounts
Deposits
Others

Source: 2007 Survey of Consumer Finances (Federal Reserve).
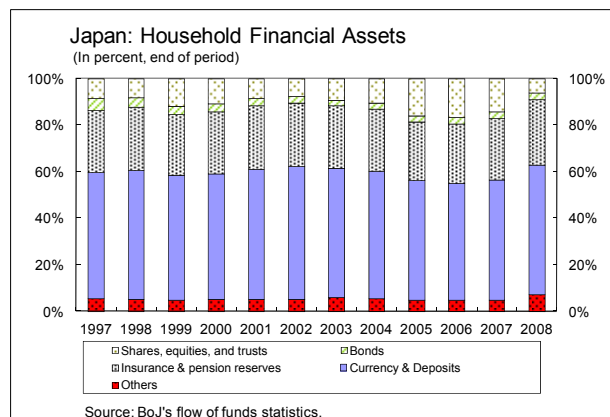
10.   **In Japan, the low share of risky assets may be attributed to regulatory, economic, and social factors. [5]**

- *Past financial regulations.* Until the late 1990s, relatively tight restrictions on investments in risky assets, such as on foreign currency deposits,[6] likely discouraged
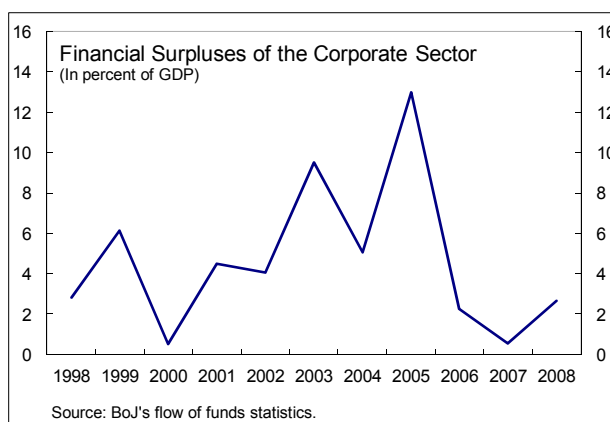
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[5] In addition to the factors listed here, Matsuura and Shiraishi (2004) argue that the age-based remuneration system, which is prevalent in Japan, could reduce holdings of risky assets. Under this system, young employees receive lower wages relative to their performance, leaving their future wages as effectively risky financial assets. These assets are subject to the uncertainty surrounding the lifetime employment system, which could encourage young workers to hold disproportionally more safe assets.

[6] Until the late 1990s, commercial banks were not allowed to provide trusts or foreign currency deposits to households.

households from investing in such assets. Even when most regulatory impediments to holding risky assets were removed in the wake of the "financial big bang" in 1998, households' risk appetite increased only slightly. Moderate adjustment costs, including high fees, for example, on trusts (Faulkner-MacDonagh and Nakagawa, 2007), were also responsible for the slow portfolio shifts, leaving the share of risky assets at a low level.

Japan: Household Financial Assets
(In percent, end of period)

Shares, equities, and trusts — Bonds — Insurance & pension reserves — Currency & Deposits — Others

Source: BoJ's flow of funds statistics.

- *Lower stock returns.* Lower stock returns, compounded by smaller dividend payouts, have not only been a drag on property income, but may also have depressed demand for stocks and trusts. Dividend payments in Japan are particularly small by international standards (Figure III.5), with stock dividend yields remaining lower than 10-year JGB yields throughout the 2000s.[7]

Financial Surpluses of the Corporate Sector
(In percent of GDP)
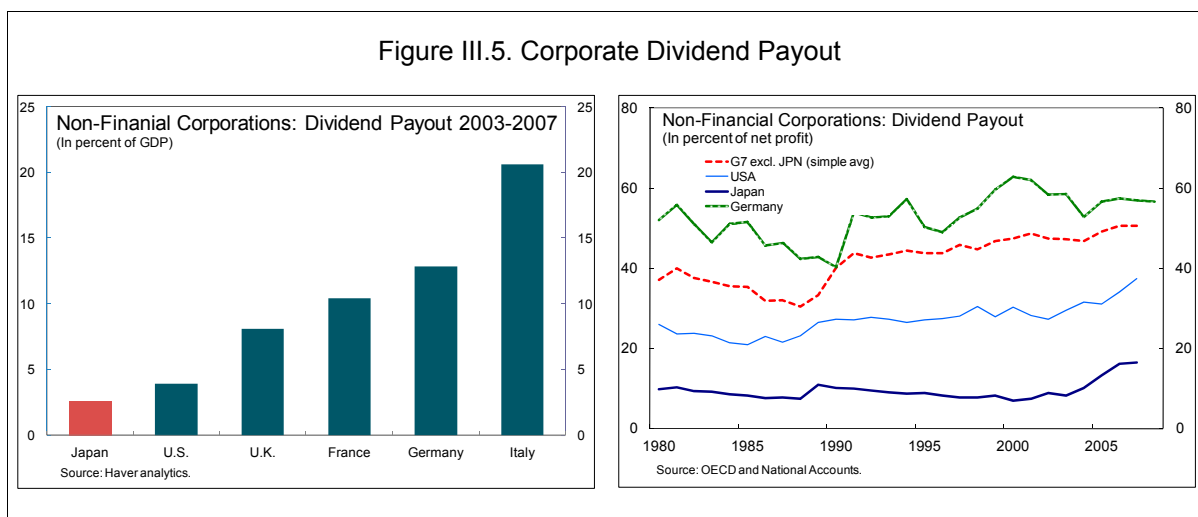
Source: BoJ's flow of funds statistics.

Even during the boom years between 2003 and 2007 when corporate profits were substantial, dividend payouts were only 2½ percent of GDP, compared to 5–10 percent of GDP in other G-5 economies. During this period, corporates were either retaining a large part of their profits as cash (deposits) or using them to pay down debt, resulting in record high financial surpluses.

The dividend payout ratio of nonfinancial corporations has recently risen to about 15 percent, but is still well below the G-7 average (50 percent). The low ratio could partly be attributed to large crossholdings of stocks, which encourage companies to retain profits.[8] However, in recent years, Japanese banks and nonfinancial corporations have been unwinding the crossholdings, possibly leading to a pickup in the payout ratio.

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[7] Stock returns including capital gains have been generally lower than 10-year JGB yields throughout the post-bubble period (Matsuura and Shiraishi, 2004).

[8] Historically, the large crossholdings may have been easing pressures against corporates to enhance their profitability and pay out more of their profits.

Figure III.5. Corporate Dividend Payout

Non-Finanial Corporations: Dividend Payout 2003-2007
(In percent of GDP)

Source: Haver analytics.

Non-Financial Corporations: Dividend Payout
(In percent of net profit)
- G7 excl. JPN (simple avg)
- USA
- Japan
- Germany

Source: OECD and National Accounts.

- *Expensive housing*. Historically, housing prices have been higher in Japan than in advanced economies, perhaps discouraging investments in risky financial assets with housing as a close substitute.[9] Housing assets were nearly 300 percent of household disposable income in Japan in 2000, compared to about 150 percent in the U.S. (Babeau and Sbano, 2003). Expensive and risky housing purchases may have encouraged Japanese homeowners to accumulate more safe liquid assets to balance their overall asset portfolio. Expensive houses may also have forced young households to increase cash and deposit saving more aggressively to finance large initial down payments. The observation that households in Japan start to increase their share of risky assets (stocks and trusts) at a later stage in life than in the U.S. (Figure III.4) is consistent with these arguments.

- *Preferences*. Although it is hard to formally test preferences, survey results suggest that Japanese households are more risk-averse than those in the U.S.[10] The collapse of the bubble in the early 1990s may have changed households' perceptions about stocks and strengthened risk aversion among Japanese households,[11] partly offsetting the impact of financial deregulation.

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[9] See, for example, Iwaisako (2003).

[10] According to Nakagawa and Shimizu (2000), the percentage of Japanese households that consider safety in financial investment to be of the utmost importance is as high as 44 percent—more than 15 percentage points higher than households in the United States.

[11] Using the U.S. data, Malmendier and Nagel (2009) find evidence for the idea (originally suggested by Ameriks and Zeldes, 2004) that those who have experienced lower stock returns in their lifetime are less likely to hold stocks.

Debt or equity financing

11.   **Japanese households have not been actively engaged in debt or equity financing.**
Possible reasons include:

- *Consumer credit*. Consumer credit
  in Japan is smaller than in the
  U.S. (10 percent of GDP and
  25 percent of GDP, respectively). In
  addition, the distribution of credit
  availability in Japan is concentrated
  among low-risk and high-risk
  borrowers, with limited credit
  extended in between—so called the
  "middle-risk" gap—who may
  benefit from the ability to smooth

  Outstanding Consumer Credit in 2008
  (In percent of household disposable income)

  Source: Flow of Funds statistics and National Accounts.

  intertemporal consumption. This is partly due to the lack of a comprehensive credit
  information system for assessing credit risk, similar to the credit bureaus in the
  U.S. Other factors behind the limited consumer credit may include households' strong
  aversion to consumer credit and the stigma attached to borrowing from a consumer
  finance company. [12]

- *Reverse home mortgage.*[13] Markets for reverse home mortgages virtually do not exist
  in Japan, perhaps constraining the ability of the elderly to spend their housing capital
  gains.[14] Starting in the 1980s, many local governments launched reverse home
  mortgages, but these failed to take hold. Lack of risk management mechanisms and
  illiquid markets for used housing have discouraged financial institutions from
  providing reverse home mortgages. On the borrowers' side, favorable tax treatment
  on land encourages the elderly to leave housing as a bequest in their wills instead of
  selling.[15] Another important factor is that few elderly people know about reverse
  home mortgages (only 20 percent in 2005, according to the Cabinet Office).

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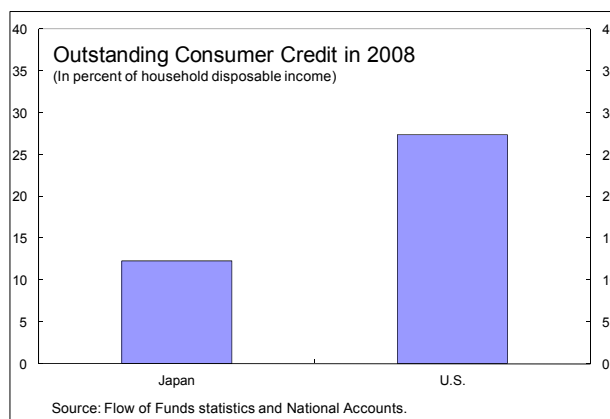
[12] Over-borrowing from consumer financing companies has been described as the "hell of consumer financing"
(or "Sarakin Jigoku" (in Japanese)) and has long been an important social problem. In response, the government
has passed legislation that caps interest rates and limits borrowing to one third annual income.

[13] A reverse home mortgage is a loan against housing equity. A resident does not have to repay the loan or move
out of his home until he or she dies.

[14] By contrast, in the U.S., the number of new reverse home mortgage contracts under the public Home Equity
Conversion Mortgage system has reached 100,000 a year, up from below 10,000 in 2000 (FHA Outlook, 2010).

[15] Some may argue that stronger bequest motives in Japan could prevent homeowners from applying for reverse
home mortgages. However, empirical evidence suggests that bequest motives are weaker in Japan than in the
U.S. (Horioka and others, 2001).

D. Policy Implications

12.   **Reviving private consumption will require a combination of reforms aimed at boosting wages, generating higher returns on savings, and improving household access to financing.** Possible measures include:
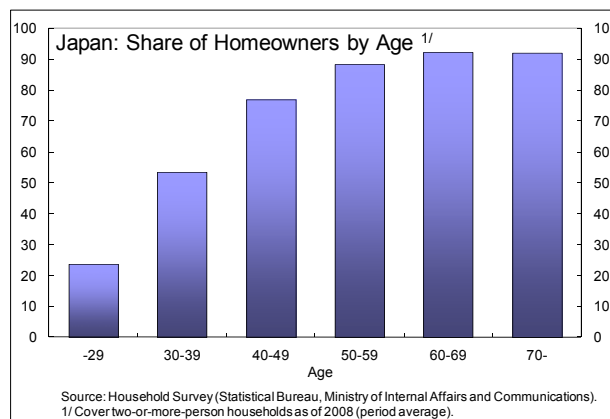
- **Boosting wage growth**

  - ➢ *Service productivity.* Accelerating labor productivity growth in the services sector, which has been lagging that in the manufacturing sector, would lift wages. In this respect, further regulatory reforms, such as in health care, could be pursued.

  - ➢ *Labor market reform.* Greater labor flexibility could lift wages through higher employment and productivity. One way would be to introduce a new regular contract with weaker employment protection that could encourage firms to hire more regular workers. This may not only give more incentives workers to accumulate human capital, helping raise productivity and returns, but also address concerns about equity between regular and nonregular workers. Such a contract would need to allow grandfathering of existing permanent contracts to mitigate uncertainty about employment prospects.

- **Diversifying portfolios**

  - ➢ *Stock returns.* Continued unwinding of cross-shareholdings could encourage greater dividend payout.[16] Deregulations to raise productivity could also strengthen firms' profitability and improve stock returns, stimulating demand for risky assets.

  - ➢ *Incentives for holding non-deposit financial assets*, such as a reduced tax rate on dividend income, could be extended (currently, the tax rate on dividend income from listed stocks is reduced to 10 percent from 20 percent, but this is scheduled to be terminated at end-2011).

- **Improving access to credit or equity financing**

  - ➢ *Consumer credit.* Access to consumer credit could be improved through greater sharing of credit information between banks and non banks.[17] Since demand for consumer finance is concentrated among low-wealth households, the aggregate impact of relaxing their liquidity constraint or reducing precautionary savings, however, might be limited.

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[16] Cross-shareholdings are being unwound particularly by banks that aim to reduce market risks.

[17] Under the revised Money Lending Act, credit information agencies (to which consumer finance companies report) have the obligation to share information on consumer credit with each other, but not to commercial banks.

> *Reverse home mortgages.* Given the rapid population aging, reverse home mortgages may have potential for stimulating consumption, as a larger fraction of the elderly are homeowners compared to the young. In light of significant risks for banks associated with providing reverse home mortgages, public assistance may be needed to jump-start this market, for example, by supplying insurance (to banks) through a government affiliated financial institution as done in the U.S. Deepening markets for used housing help banks to more easily sell houses they accept.

Japan: Share of Homeowners by Age [1]

Source: Household Survey (Statistical Bureau, Ministry of Internal Affairs and Communications).
1/ Cover two-or-more-person households as of 2008 (period average).

13.   **Finally, steps to strengthen the social security system would help reduce households' precautionary savings.** Murata (2003) provides evidence for the existence of precautionary savings that stem from concerns about future public pension benefits. Ongoing reforms to enhance the reliability of the public pension system and efforts to improve the government fiscal positions would lessen uncertainty about household's future income prospects.

E. Conclusion

14.   **For Japan, reforms to stimulate private consumption hold significant promise for boosting growth.** This could be achieved by boosting household disposable income through higher productivity growth and returns, combined with steps to facilitate shifts in household balance sheets.

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