

# IMF Working Paper

---

## The Impact of Fiscal Consolidation and Structural Reforms on Growth in Japan

*S. Pelin Berkmen*

**IMF Working Paper**

Asia and Pacific Department

**The Impact of Fiscal Consolidation and Structural Reforms on Growth in Japan**

Prepared by S. Pelin Berkmen \*

Authorized for distribution by Kenneth Kang

January 2011

**Abstract**

With Japan's public debt reaching historical levels, the need for fiscal consolidation and structural reforms have increased. As fiscal consolidation will require a sustained and large adjustment in the fiscal balance, its growth effect is a concern particularly for the short run. This paper uses the IMF's Global Integrated Monetary and Fiscal Model to analyze the growth impact of fiscal consolidation and structural reforms. Although fiscal consolidation has short-term costs, the potential long-term benefits are considerable, and reforms that raise potential growth could support consolidation. Simulations show that the external environment also matters but domestic policies should be the priority.

JEL Classification Numbers: E62; F41; H30; H63

Keywords: Fiscal consolidation, tax reform, structural policies

Author's E-Mail Address: pberkmen@imf.org

**This Working Paper should not be reported as representing the views of the IMF.**

The views expressed in this Working Paper are those of the author and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author and are published to elicit comments and to further debate.

---

\* The author would like to thank Papa N'Diaye and Dirk Muir for their invaluable comments.

	Contents	Page
I.	Introduction.....	3
II.	The Model.....	4
III.	Calibration.....	7
IV.	Impact of Fiscal Consolidation on Growth.....	7
V.	Impact of Combined Policy Package of Fiscal Consolidation and Structural Reforms .....	10
VI.	Spillovers from the Rest of the World .....	11
VII.	Conclusions.....	13
	References.....	14
	Appendix.....	17

#### Tables

1.	Long Run Growth Rates and Interest Rates.....	17
2.	Utility Functions .....	17
3.	Elasticities of Substitution .....	17
4.	Steady State Markups .....	18
5.	Steady State Expenditure to GDP Ratios.....	18
6.	Steady State Factor Shares and Depreciation Rates .....	19
7.	Miscellaneous Steady State Ratios and Parameters.....	19
8.	Financial Accelerator .....	19
9.	Monetary Rule Parameters.....	20
10.	Fiscal Rule Parameters.....	20

#### Figures

1.	Fiscal Consolidation and Structural Reforms in Japan.....	15
2.	Fiscal Consolidation and Structural Reforms in Japan and the Rest of the Regions...16	

## I. INTRODUCTION

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 will weaken aggregate demand. 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.

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 the 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 adjustment would likely have to rely on additional revenue measures including increases in the consumption tax.<sup>1</sup>

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.<sup>2</sup> Growth remained robust in 2008.

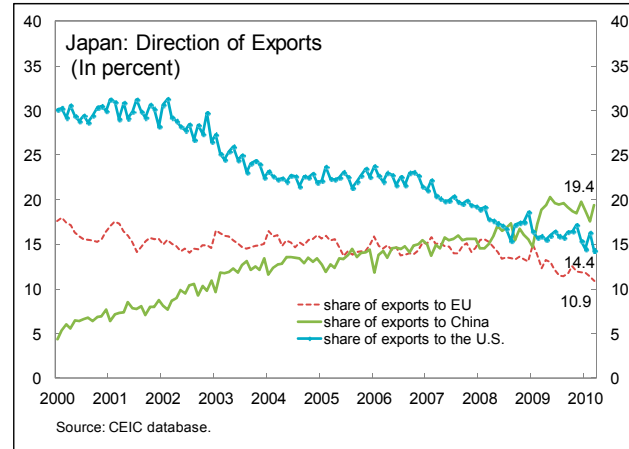
Structural reforms could help offset the negative impact of fiscal consolidation and raise medium-term potential growth. In this context, policies aiming at raising services sector productivity through deregulation or increasing competition and labor market flexibility could support fiscal consolidation through higher tax revenues.

---

<sup>1</sup> See Japan staff report for the 2010 Article IV Consultation, IMF Country Report no. 10/211, July 2010.

<sup>2</sup> 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.

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 moderate, and 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 (U.S.) 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.

To assess the growth implications of fiscal consolidation and structural reforms, the paper uses a 5-block version of the IMF's Global Integrated Monetary and Fiscal (GIMF) model.<sup>3</sup> 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 be a source for renewed economic strength. In addition, comprehensive reforms would allow Japan to benefit from changes in the world economic landscape as it re-orientes its economy to fast growing emerging market economies.

## II. THE MODEL

Details of the model are available in Kumhof et. al. (2010). Below is brief summary of the main features.

This paper uses the annual version of GIMF, which is a Dynamic Stochastic General Equilibrium (DSGE) model, covering five regions. 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. The world economy's technology grows at the constant rate. The model includes unions, manufacturers, capital, investment and

<sup>3</sup> The five regions are the U.S., the Euro Area, Japan, emerging Asia and other countries.

consumption goods producers, distributors, households, the government, and banks. Asset markets are incomplete. Households receive lump-sum dividends from the ownership of firms, rather than a traded equity. The government issues one-period bonds denominated in domestic currency. In addition, households can invest in one-period domestic currency fixed-term deposits, which then are used by banks to fund loans to entrepreneurs. International asset trade is limited to nominally non-contingent bonds denominated in U.S. dollars. Banks pay a fixed market rate of return on deposits and charge a risk premium on loans. Country risk premia are included in uncovered interest parity condition.

### ***Households***

Each country is populated by two types of households, who consume final retail output and supply labor to unions. Liquidity constrained households do not have access to financial markets and consequently are limited to consuming their after tax income in every period.<sup>4</sup> Overlapping generation households are the second type of households with finite planning horizons and hold domestic currency denominated bonds issued by their government or banks, as well as foreign currency denominated bonds. Each of these agents faces a constant 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 and transfers.

### ***Firms, Unions, and Financial Sector***

Firms and unions are owned by households and therefore are myopic and have finite planning horizons. Entrepreneurs and retailers, except for capital goods producers, are monopolistically competitive and subject to nominal rigidities in price setting. Manufacturers buy capital services from entrepreneurs and labor from unions, which buy labor from households. Entrepreneurs buy capital from capital goods producers and 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 public capital stock (without charge) with nontradable, domestic and foreign tradable goods. They sell to domestic and foreign consumption and investment goods producers. Consumption and investment goods producers combine domestic and foreign output. Consumption goods are sold to retailers and the government, while investment goods are sold to capital goods producers and the government. Retailers are also monopolistically competitive and subject to real rigidities, supplementing inertial consumption dynamics. There are import adjustment costs at both intermediate and final good level, smoothing the response of imports to changes in the real exchange rate.

---

<sup>4</sup> The modeling of the liquidity constrained agents is based on Galí, López-Salido and Vallés (2007).

Banking and entrepreneur sectors are modeled based on Bernanke and et.al. (1999) and Christiano et. al. (2007). Entrepreneurs finance capital with net worth and bank loans. Return on entrepreneur's capital is subject to idiosyncratic risk, but as they are risk neutral they bear all the risk in the loan contract, which specifies a state contingent schedule of gross interest rates to be paid if the productivity is above a cut-off level. If productivity is below the cut-off, then the entrepreneur bankrupts and the bank gets the entire capital stock. During this process, only a portion of the fair value of the capital is recovered. The external finance premium is the difference between the rate paid by entrepreneurs to banks and the rate paid by banks to depositors and increases with the leverage ratio of the borrowers.

### ***Fiscal Policy***

Fiscal policy includes a rich set of instruments: government consumption and investment, lump-sum taxes and transfers, taxes on labor, consumption and capital. While government consumption spending is unproductive, the government investment spending contributes to infrastructure capital. Tax revenue is endogenous and determined by labor, consumption, capital and lump-sum taxes.

A fiscal policy rule stabilizes deficits and the business cycle. It first stabilizes the interest inclusive government deficit to GDP ratio at a long-run target level, and this rules out default and fiscal dominance. Second, it stabilizes the business cycle by reducing the deficit with the output gap. Fiscal policy can be characterized by the degree to which automatic stabilizers work. In particular, the fiscal policy rule can be represented as follows:

$$gd_t^{rat} = gdss_t^{rat} - d^{gdp} \ln \left( \frac{gdp_t}{gdp_{pot}} \right), \quad (1)$$

where  $gd_t^{rat}$  is government deficit to GDP ratio, and  $gdss_t^{rat}$  is the long-run target. Shocks to this target can be interpreted as changes in government savings preference. The business cycle stabilizing component can be captured by  $d^{gdp}$ .<sup>5</sup>

### ***Monetary Policy***

Monetary policy is modeled through a standard interest rate rule with interest rate smoothing and reaction function stabilizing inflation, output gap, output growth, and/or deviations of current exchange rate depreciation from its long-run value.

$$i_t = E_t (i_{t-1})^{\delta_i} (r_t^{eq} \tilde{\pi}_t)^{1-\delta_i} \left( \frac{\tilde{\pi}_t}{\bar{\pi}_t} \right)^{(1-\delta_i)\delta_\pi} \left( \frac{gdp_t^{fisher}}{gdp_t^{pot}} \right)^{(1-\delta_i)\delta_y} \left[ \left( \frac{gdp_t^{fisher}}{gdp_{t-4}^{fisher}} \right) \right]^{(1-\delta_i)\delta_y} \left( \frac{\varepsilon_t}{\bar{\varepsilon}_t} \right)^{\delta_\varepsilon} S_t^{int}, \quad (2)$$

Zero interest rate bound can be simulated through either keeping interest rates constant for a certain period of time or alternatively setting the interest rate smoothing parameter high.

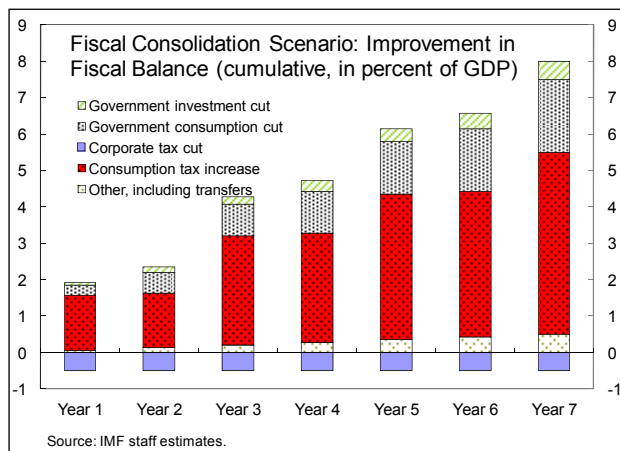
### III. CALIBRATION

Most parameters are the same as in Kumhof, Laxton, Muir, and Mursula (2010) and are listed in the appendix. This section highlights some of the key parameters and differences. Steady state inflation rate is 1 percent for Japan, 2.5 percent for the U.S. and Asia, and 2 percent for the rest of the regions. The share of non-tradables is 63.8 percent for Japan, and 50 percent for the rest of the world (RoW). The NFA to GDP ratios are set to zero to eliminate the valuation effects. The share of labor income taxes is 48 percent for Japan and 40 percent for the RoW; the share of capital income taxes is 14 percent for Japan and 10 percent for the RoW, and consumption taxes are 19 percent for Japan and 25 percent for the RoW. Government net debt is 87 percent of GDP for Japan, 55 percent for Asia, 50 percent for the U.S. and 60 percent for the rest of the regions. Labor income share to GDP is 54 percent for Japan, and 60 percent for the rest of the regions.

### IV. IMPACT OF FISCAL CONSOLIDATION ON GROWTH

Stabilizing and lowering public debt ratio would require about 10 percent of GDP adjustment in structural primary balance, coming from both cyclical factors and 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 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.

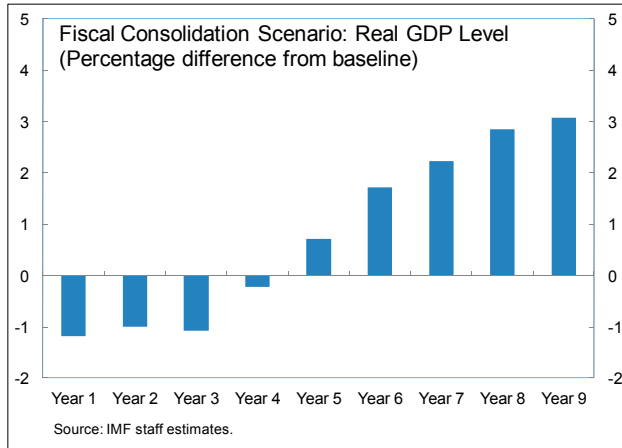


<sup>5</sup> The model uses the Organization for Economic Cooperation and Development (OECD) estimates for  $d^{gdp}$  (Girouard and André, 2005).



Without any additional policy measures, fiscal adjustment would depress GDP in the short run by about 1 percentage point. 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.

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, 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.

Over the medium term, however, real GDP could rise above the baseline by about 2–3 percentage points, but the exact magnitude would depend on various factors. 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 is likely offset by a reduction in precautionary savings. In particular, younger generations who are concerned about fiscal sustainability and the pension system are saving more now than otherwise. While the savings rate for older generations has been declining, the younger generations continue to save at a higher rate. While there is no consensus on the size of the precautionary savings in Japan, and estimates vary depending on the measure of income and pension uncertainty and survey data, precautionary motives is proxied by a decline in savings by about 1 percentage points, gradually declining in about 10 years starting from the third year.
- *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 could eventually emerge

over time in the absence of fiscal consolidation. Tokuoka (2010) shows that without any policy adjustment and given current trends in savings, gross public debt<sup>6</sup> could exceed gross households' financial assets in about 5 years. This could 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 gradually reduce the risk premium by 50 basis permanently.<sup>7</sup>

- *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 paper assumes a limited decline in corporate taxes; further 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.* Business confidence is critical for Japan's growth prospects and appears to be one of the factors that is holding back the recovery in investment. With concerns over the fiscal situation and its implications for long-term growth prospects, business sentiment is likely to stay weak. A credible fiscal consolidation could improve business confidence and encourage investment by laying out a clear path to fiscal sustainability and raising expectations of stable economy and higher growth potential. 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). Given the importance of business confidence for Japan's recovery, it is important to note that if the fiscal policy is not credible and business confidence does not recover, the short term demand depression could be much worse and medium-term growth benefits could take long time to materialize.

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 and current account surplus by about 1.5 percentage points.

These simulations limit monetary policy reaction with very high degree of interest rate smoothing, to capture the effect of zero interest rate bound. With the policy rate held at zero level, inflation would fall below the baseline, pushing up real interest rates and depressing demand further. Over the long-run, in the new steady state, higher national savings and lower risk premium would help lower real interest rates.

---

<sup>6</sup> Including public debt owed by the Fiscal Investment and Loan Program.

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

## V. IMPACT OF COMBINED POLICY PACKAGE OF FISCAL CONSOLIDATION AND STRUCTURAL REFORMS

Structural reforms to boost potential growth could support growth during consolidation. The authorities' medium-term growth strategy highlights the importance of developing certain key sectors, such as health and education. In this context, this section focuses on two main areas: increasing the overall productivity and enhancing competition in labor and product markets.

While Japan has considerable scope for raising productivity in the services sector, a broad based approach with policies focusing on increasing productivity in both tradable and non-tradable sectors would help lift the overall growth prospects. Since 1990s, labor productivity level and growth in services have been lower than those of Japan's manufacturing sector.<sup>8</sup> A high degree of regulation in certain sectors, such as health, elderly care, and childcare, is one of the factors limiting productivity. In addition, there is room for further efficiency gains in other sectors including retail services. At the same time, focusing on policies that would create overall efficiency gains and increase the broad based productivity is more likely to create synergies that would raise overall growth prospects and contribute global rebalancing by avoiding the distortion of the relative prices in favor of non-traded sector. In fact, the government's growth strategy targets a wide range of sectors covering both tradable and non-tradable sectors.

While identifying specific structural reforms to raise productivity in these sectors is beyond the scope of this analysis, this section looks at the implications of productivity increases on the rest of the economy. Based on some sector-level studies and targets determined by the authorities' growth strategy, a reasonable range for productivity increase would be about 0.5–1 percentage points.

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 enhance competition and efficiency. In addition, introducing more flexible regular labor contracts 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. 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.

---

<sup>8</sup> Khatri and Ogawa (2007), OECD (2008), Sommer (2009).

The growth effects will also depend on confidence effects and its impact on investment. To the extent that business confidence boosts investment at an earlier stage growth effects would be enhanced in both short and medium term.

Another factor that would determine the short term dynamics is the flexibility of the monetary policy. With a high degree of interest rate smoothing through uncovered interest parity the nominal exchange rate would appreciate. On the other hand, with more flexible monetary policy, higher demand and inflation initially would lead to more depreciated nominal exchange rate, improving short term growth effects.

A combined policy package of fiscal consolidation and structural reforms would improve GDP 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. Depending on the confidence effects and associated investment response, real GDP can increase above the baseline by about 3–10 percent. While productivity increases will accumulate gradually through time, a credible policy package, securing sustainable public debt as well as higher potential growth and competitiveness could lift investment through improved business confidence and improve growth expectations. The flexibility of the monetary policy would be important for short-term dynamics, with a more gradual growth benefits with constrained monetary policy, but the long term benefits would be broadly the same.

In comparison with fiscal consolidation scenario, keeping monetary policy and confidence assumptions constant, a broad based productivity increase would appreciate the yen in the short term leading to a decline in trade and current account surplus initially. However, the short-term exchange rate effects would depend on the flexibility of the monetary policy in responding shocks. Overall, as long as the productivity increases are broad based, and not restricted to non-tradables, the exchange rate would be less depreciated than the fiscal scenario, reducing or reversing the improvement in the current account.

## **VI. SPILLOVERS FROM THE REST OF THE WORLD**

Changes in the pattern of growth in the rest of the world are also likely to affect the impact of Japan's consolidation. This section focuses on potential spillovers from two regions: emerging Asia and the U.S.

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.<sup>9</sup>

In the U.S., the private saving rate is assumed to increase in the aftermath of the recent global crisis. It is assumed to increase by 2½ percent of GDP above the baseline, while private investment declines on account of household deleveraging and tighter financial regulation.

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.<sup>10</sup> The rebalancing in emerging Asia, on the other hand, has offsetting effect, with demand for Japanese products increasing and the yen depreciating in real terms.

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. It is worth mentioning that there may be additional positive spillovers from structural reforms in the rest of the region to Japan, which are not considered in this section. Growth benefits from the rebalancing in the rest of the regions, therefore, are rather on the lower end.

In a scenario in which 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 over the levels seen in the previous section. Still, domestic policies are the main factors that increase the GDP above the baseline. Under a full adjustment scenario, overall consumption increases, while in the short-term liquidity constrained agents consume less due to lower transfers. In the new equilibrium, the trade balance and current account are still higher than the baseline, and the real effective exchange rate remains depreciated, albeit the increases in both the current account and exchange rate are much more limited compared with fiscal consolidation scenario.

The degree of productivity increases, decline in mark-ups, and confidence effects are all factors determining the magnitude of the growth impact. If 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.

---

<sup>9</sup> This scenario is consistent with the rebalancing scenario analyzed in Chapter 3 of the Asia and Pacific Department’s Regional Economic Outlook, April 2010.

<sup>10</sup> 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 of the US dollar.

## VII. CONCLUSIONS

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 paper 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, a switch to less distortionary corporate taxes, and improved confidence and investment. If policies are implemented credibly, the growth benefits can be captured earlier through increased investment.

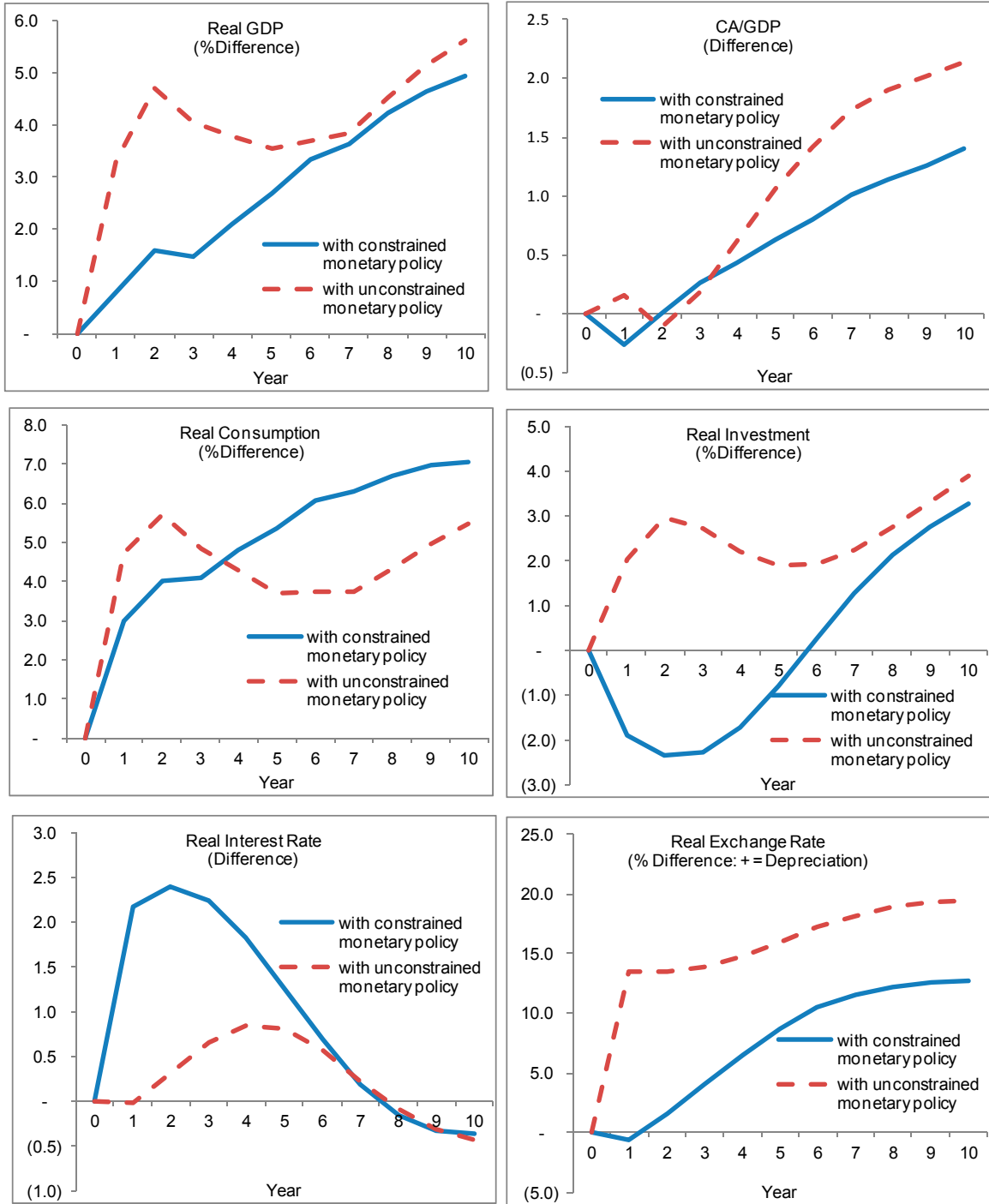
While adjustment is important for securing fiscal sustainability, reforms that raise potential growth could also support consolidation. Structural reforms aiming at raising the overall productivity level in the economy has tremendous potential for not only offsetting negative demand effects from fiscal consolidation, but also contributing to global rebalancing by limiting further increases in the current account.

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.

## REFERENCES

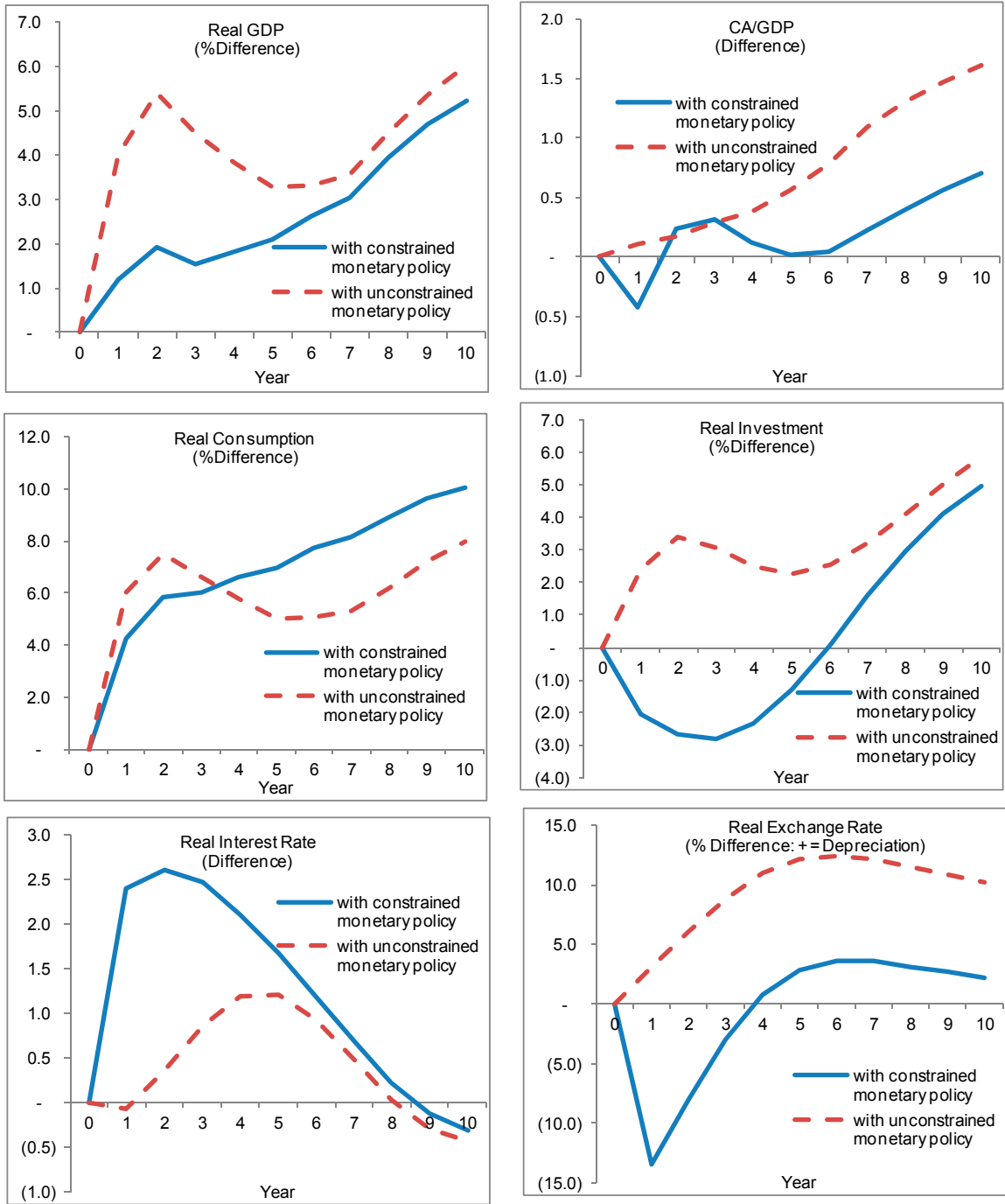
- Bernanke, B.S., M. Gertler, and S. Gilchrist, 1999, “The Financial Accelerator in a Quantitative Business Cycle Framework” in Taylor, J.B. and Woodford, M. eds., *Handbook of Macroeconomics*, Vol. 1C. Amsterdam Elsevier.
- Christiano, L., R. Motto, and M. Rostagno, 2007, “Financial Factors in Business Cycles,” Working Paper.
- Galí, J., J.D. López-Salido, and J. Vallés, 2007, “Understanding the Effects of Government Spending on Consumption,” *Journal of European Economic Association*, 5 (1), 227–270.
- Girouard, N. and C. André, 2005, “Measuring Cyclically-Adjusted Budget Balances for OECD Countries,” OECD Economics Department Working Papers, No. 434, OECD Publishing.
- Khatri, Yougesh and Sumiko Ogawa, 2007, “Japan: Boosting Productivity in Services-Priorities for Deregulation,” Japan: 2007 Article IV Consultation—Selected Issues Paper, IMF Country Report No. 07/281 (Washington: International Monetary Fund).
- Kiyota, Kozo et.al, 2009, “Measurement of the Market Power of Firms: The Japanese Case in the 1990s,” *Industrial and Corporate Change*, Vol. 18, No. 3, pp. 381–414.
- Kumhof, Michael, et.al, 2010, “The Global Integrated Monetary and Fiscal Model—Theoretical Structure,” IMF Working Paper, No. 10/34 (Washington: International Monetary Fund).
- N’Diaye, Papa, et. al., 2010, “Does Asia Need Rebalancing?” Asia and Pacific Department, Regional Economic Outlook, April 2009, Chapter III (Washington: International Monetary Fund).
- OECD, 2008, “OECD Economic Surveys: Japan,” Vol. 2008/4, April 2008 (Paris: Organization for Economic Co-operation and Development).
- Sommer, Martin, 2009, “Why are Japanese Wages So Sluggish?” IMF Working Paper, No. 09/97 (Washington: International Monetary Fund).
- Syed, Murtaza and Jinsook Lee, 2010, “Raising Medium-Term Growth: What Role Can Investment Play?” Japan: 2010 Article IV Consultation—Selected Issues Paper, (Washington: International Monetary Fund).
- Tokuoka, Kiichi, 2010, “The Outlook for Financing Japan’s Public Debt,” IMF Working Paper, No. 10/19 (Washington: International Monetary Fund).

**Figure1. Fiscal Consolidation and Structural Reforms in Japan**





**Figure 2: Fiscal Consolidation and Structural Reforms in Japan and the Rest of the Regions**



## APPENDIX

Table 1. Long Run Growth Rates and Interest Rates

	US	AS	EU	JA	RC
World Technology Growth	1.015	1.015	1.015	1.015	1.015
World Population Growth	1.01	1.01	1.01	1.01	1.01
Steady State Inflation Rate	1.025	1.025	1.02	1.01	1.02
Long Run Real Interest Rate	1.03	1.03	1.03	1.03	1.03
Forex Risk Premium	0	0	0	0	0
Government Risk Premium	0	0	0	0	0

Table 2. Utility Functions

	US	AS	EU	JA	RC
Average Planning Horizon in Years ( $\theta=0.9$ )	10	10	10	10	10
Average Remaining Working Life ( $\chi=0.95$ )	20	20	20	20	20
Intertemporal Elasticity of Substitution ( $\gamma=4$ )	0.25	0.25	0.25	0.25	0.25
Labor Supply Elasticity( endogenizes $\eta_{OLG}, \eta_{LIQ}$ )	0.5	0.5	0.5	0.5	0.5
Share of Liquidity Constrained Agents $\psi$	0.25	0.5	0.25	0.25	0.5
Dividend Share of Liq. Constrained Agents	0.125	0.25	0.125	0.125	0.25

Table 3. Elasticities of Substitution

	US	AS	EU	JA	RC
Nontradables: Capital-Labor $\xi_{ZN}$	1	1	1	1	1
Tradables: Capital-Labor $\xi_{ZT}$	1	1	1	1	1
Nontrad. Import Agents: Diff. Countries $\xi_{NM}$	0.75	0.75	0.75	0.75	0.75
Tradables Import Agents: Diff. Countries $\xi_{TM}$	0.75	0.75	0.75	0.75	0.75
Distributors: Home-Foreign Tradables $\xi_T$	0.75	0.75	0.75	0.75	0.75
Inv. Goods Producers: Home-Foreign Trad. $\xi_I$	0.75	0.75	0.75	0.75	0.75
Cons. Goods Producers: Home-For. Trad. $\xi_C$	0.75	0.75	0.75	0.75	0.75
Distributors: Tradables-Nontradables $\xi_A$	0.5	0.5	0.5	0.5	0.5
Government: Cons.- Investment Goods $\xi_G$	0.5	0.5	0.5	0.5	0.5

**Table 4. Steady State Markups**

	<b>US</b>	<b>AS</b>	<b>EU</b>	<b>JA</b>	<b>RC</b>
Nontradables Manufacturing $\mu_N$	1.1	1.1	1.1	1.1	1.1
Tradables Manufacturing $\mu_T$	1.1	1.1	1.1	1.1	1.1
Union Wage Setting $\mu_U$	1.1	1.1	1.1	1.1	1.1
Investment Goods Production $\mu_I$	1.05	1.05	1.05	1.05	1.05
Consumption Goods Production $\mu_C$	1.05	1.05	1.05	1.05	1.05
Retail Sector $\mu_R$	1.05	1.05	1.05	1.05	1.05
Nontradables Import Agents $\mu_{NM}$	1.025	1.025	1.025	1.025	1.025
Tradables Import Agents $\mu_{TM}$	1.025	1.025	1.025	1.025	1.025

**Table 5. Steady State Expenditure to GDP Ratios**

	<b>US</b>	<b>AS</b>	<b>EU</b>	<b>JA</b>	<b>RC</b>
Share in WorldGDP	27.4	12.3	22	9.1	29.3
Consumption/GDP	65.1	59.2	58.1	59.8	59.1
OLG Consumption/GDP	51.3	34.3	45.8	46.9	34
LIQ Consumption/GDP	13.8	24.9	12.3	12.9	25.1
Private Investment/GDP	17.2	25	18.3	21	19
Government Spending/GDP	17.5	16	23.5	19.5	22
Government Investment/GDP	2.5	4	3	2.5	2
Government Consumption/GDP	15	12	20.5	17	20
Government Transfers/GDP	20	10	20	20	20
Trade Balance/GDP	0.2	-0.2	0.1	-0.3	-0.1
Exports/GDP	11.7	26.8	17.5	10.8	21.9
Final Goods Exports/GDP	8.3	20.5	13.7	8	9.6
Intermediate Goods Exports/GDP	3.4	6.3	3.8	2.8	12.3
Imports/GDP	11.5	27	17.4	11	21.9
Consumption Goods Imports/GDP	5.2	5.7	6.8	3.8	9.1
Investment Goods Imports/GDP	2.6	6.4	4	1.6	7.5
Intermediate Goods Imports/GDP	3.7	14.9	6.6	5.6	5.3
Tradables Demand Effects of Technology	1	1	1	1	1
Nontradables Demand Effects of Technology	1	1	1	1	1

**Table 6. Steady State Factor Shares and Depreciation Rates**

	<b>US</b>	<b>AS</b>	<b>EU</b>	<b>JA</b>	<b>RC</b>
Labor Income/GDP	60	54	60	60	60
Nontradables Labor Income/GDP	66	60	66	66	66
Tradables Labor Income/GDP	54	48	54	54	54
Depreciation Rate of Private Capital	0.1	0.12	0.1	0.1	0.1
Nontradables Output/Manufacturing Output	50	50	50	63.8	50
Cons. Goods Input/Government Output	50	50	50	50	50

**Table 7. Miscellaneous Steady State Ratios and Parameters**

	<b>US</b>	<b>AS</b>	<b>EU</b>	<b>JA</b>	<b>RC</b>
Government Debt/GDP	50	55	60	87	60
Net Foreign Assets/GDP	0	0	0	0	0
Labor Income Taxes/Total Taxes	40	40	40	48	40
Capital Income Taxes/Total Taxes	10	10	10	14	10
Consumption Taxes/Total Taxes	25	25	25	19	25
Lump-Sum Taxes/Total Taxes	25	25	25	19	25
Depreciation Rate of Public Capital	0.04	0.04	0.04	0.04	0.04
Output Elasticity w.r.t. Public Capital	0.14	0.14	0.14	0.14	0.14

**Table 8. Financial Accelerator**

	<b>US</b>	<b>AS</b>	<b>EU</b>	<b>JA</b>	<b>RC</b>
Leverage in Nontradables in %	100	100	100	100	100
Leverage in Tradables in %	100	100	100	100	100
Annual Bankruptcy Rate in Nontradables in %	8	8	8	8	8
Annual Bankruptcy Rate in Tradables in %	8	8	8	8	8
External Finance Prem. in Nontradables in %	1.5	1.5	1.5	1.5	1.5
External Finance Premium in Tradables in %	1.5	1.5	1.5	1.5	1.5

**Table 9. Monetary Rule Parameters**

	<b>US</b>	<b>AS</b>	<b>EU</b>	<b>JA</b>	<b>RC</b>
$\delta i$	0.715	1	0.343	0.392	0.715
$\delta \pi$	1.034	0	1.483	0.913	1.034
$\delta \tilde{\pi}$	0.216	1	0.237	0.216	0.216
$\delta y$	0	0	0	0	0
$\Delta y_{gr}$	0.25	0	0	0	0
$\delta e$	0	10000	0	0	0

**Table 10. Fiscal Rule Parameters**

	<b>US</b>	<b>AS</b>	<b>EU</b>	<b>JA</b>	<b>RC</b>
$d_{gdp}$	0.34	0.25	0.49	0.33	0.3
$d_{debt}$	0	0	0	0	0
$d_{tax}$	0	0	0	0	0
$d_{drawmat}$	0	0	0	0	0
$d_{ctax}$	0	0	0	0	0
$d_{ktax}$	0	0	0	0	0