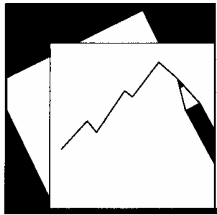


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## The Domestic and Global Impact of Japan's Policies for Growth

*Nicoletta Batini, Papa N'Diaye, and  
Alessandro Rebucci*



## IMF Working Paper

Research Department and Asia Pacific Department

### The Domestic and Global Impact of Japan's Policies for Growth

Prepared by Nicoletta Batini, Papa N'Diaye, and Alessandro Rebucci<sup>1</sup>

Authorized for distribution by Gian Maria Milesi Ferretti and Alessandro Zanello

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#### Abstract

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Japan is facing a sizable fiscal imbalance against a backdrop of weak trend growth and growing external imbalances in the world economy. This paper examines the possible impact of fiscal adjustment and productivity-enhancing structural reforms on the Japanese and world economies. Simulation results indicate that these could reduce substantially Japan's fiscal imbalance with only limited spillovers to the rest of the world. Specifically, faster productivity growth would help lower Japan's debt and limit the tendency of fiscal consolidation to increase the external surplus. In fact, very rapid productivity growth could potentially lead to a decline in Japan's external surplus and thereby have a positive effect on global imbalance. The modest extent of the spillovers to the rest of the world reflect the small size of the shocks and the diminished size of Japan in the world economy.

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Author(s) E-Mail Address: [nbatini@imf.org](mailto:nbatini@imf.org), [pnidiaye@imf.org](mailto:pnidiaye@imf.org), [arebucci@imf.org](mailto:arebucci@imf.org)

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## I. INTRODUCTION

Japan is facing a sizable fiscal imbalance, against a backdrop of weak trend growth and growing external imbalances in the world economy. In addition, healthcare and social security spending associated with an aging population will add significantly to strains on public finances in the years ahead. In light of these issues, the Japanese government is taking a range of policy measures aimed at raising productivity growth and stabilizing the public debt in relation to GDP over the medium term.<sup>2</sup>

This paper illustrates the possible impact of fiscal adjustment and productivity-enhancing structural reforms on the Japanese and world economies. More specifically, using a five-bloc version of the IMF's Global Economy Model (GEM) featuring Japan, emerging Asia, the United States, the euro area and the rest of the world, the paper addresses the following two questions:

- What is the likely adjustment of key macroeconomic variables as Japan moves toward external equilibrium under alternative fiscal consolidation and total factor productivity growth scenarios?
- Do alternative policy scenarios in Japan have different implications for external adjustment in the rest of the world?

The simulation results indicate that fiscal adjustment combined with productivity-enhancing reforms could reduce substantially Japan's fiscal imbalance with only limited spillovers to the rest of the world. Faster productivity growth would help lower Japan's debt and limit the tendency of fiscal consolidation to increase the external surplus. If even larger productivity gains could be achieved, Japan could also contribute to global current account rebalancing through a decline in its external surplus. The spillovers to the rest of the world appear to be modest even in this case, though, partly reflecting the diminished size of Japan in the world economy.

Section II of this paper provides an overview of the theoretical model we use and its calibration to a five-region world economy. Section III describes the baseline scenario and the alternatives we consider. Section IV presents the simulation results. Conclusions and policy implications follow in Section V.

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<sup>2</sup> See the report for the 2005 IMF Article IV consultation with Japan for more details (IMF Country report No. 05/273).

## II. THE MODEL

The model we use is a five-bloc version of one documented in detail by Faruquee and others (2005).<sup>3</sup> Therefore, here, we outline only its basic structure and discuss its calibration to a five-region world economy.

### A. Model Description

The world economy consists of five regional blocs or countries: the United States (US), Japan (JA), emerging Asia (AS), the euro area (EA), and the rest of the world (ROW). There is a balanced trend growth path in the world economy and non-zero, longrun net foreign asset positions. The United States and the euro area are net debtors, while the other three blocs are net creditors in steady state.

In each bloc there are households, firms, and one or more government. Households are infinitely lived, consume a basket of nontradable final goods with habit persistence and are monopolistic suppliers of a differentiated labor input to all domestic firms, also with habit persistence. There are two types of households: forward-looking ones and liquidity-constrained ones. Wage contracts are subject to adjustment costs, which give rise to nominal wage rigidities. Households own all domestic firms and the domestic capital stock, which they rent to domestic firms. The market for capital is competitive, but capital accumulation is subject to adjustment costs. Labor and physical capital are immobile internationally. Households trade internationally a short-term nominal bond, denominated in U.S. dollars, and issued in zero net supply worldwide (trade is only bilaterally with the United States, although international good trading is multilateral). There are financial intermediation costs for accessing the international bond market that ensure determinacy of the steady-state net foreign asset distribution and model stationarity following temporary shocks. There is no distinction between gross and net positions, and hence there is limited scope for balance sheet effects of exchange rate changes in the transmission of shocks we consider in the analysis.

Firms produce two nontradable final goods (a consumption good and an investment good), a nontradable intermediate good, and a tradable intermediate good, and provide distribution and financial intermediation services. Perfectly competitive firms produce final goods by using all intermediate goods as inputs: nontradables, domestic tradables, and imported tradables. The baskets of imports are CES aggregates of baskets of tradable goods from the other four world regions. The final goods can be consumed or invested by private agents and the government. Imperfectly (i.e., monopolistic) competitive firms produce intermediate goods by using labor and capital as inputs. Prices of intermediate goods are subject to adjustment costs, which give rise to nominal price rigidities. Nontradable intermediate goods are used directly in the production of the final good. Tradable intermediate goods are used in the production of the domestic and foreign final goods.

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<sup>3</sup> The April and September 2005 *World Economic Outlook* analyses of the global external imbalance are based on the same model.

The government purchases the two national goods, as well as nontradable services. As treasury, the government finances the excess of its expenditures over net taxes by borrowing from the domestic private sector. A fiscal rule then achieves a given long-run target for the public debt-to-GDP ratio through changes in distortionary taxes on labor and capital income. Changes in the level of government debt engender changes in the demand for long-run holdings of foreign assets, which affect consumers' net worth and hence output. Also, fiscal policy affects the economy through its impact on the interest rate premium, defined as the difference between the interest rate on yen-denominated and dollar-denominated assets of comparable maturity. Specifically, the interest rate premium depends explicitly on the level of debt in relation to GDP, thus inducing a positive long-run effect of fiscal consolidation on output. As central bank, the government manages the national short-term nominal interest rate. Monetary policy is specified in terms of a credible commitment to an interest rate rule that either targets inflation (in all regions except emerging Asia) or the exchange rate (in emerging Asia).<sup>4</sup>

## B. Model Calibration

The specific values of the model parameters are chosen by relying on the existing literature, as well as empirical evidence gathered in previous GEM work. The trade ratios and shares match actual data. The steady-state levels of the real exchange rate and current account at the end of the adjustment process are broadly consistent with benchmarks derived from the structural estimation of saving-investment norms (e.g., Faruqee and Isard, 1998). The calibration of the relationship between government debt and net foreign assets relies on the database developed by Lane and Milesi-Ferretti (2005) and uses elasticities found in other overlapping generations models employed at the IMF, such as MULTIMOD (Laxton and others, 1998).

Tables 1 through 6 document the parameterization adopted for the five regional blocs.<sup>5</sup> Table 1 reports the parameter governing the optimization problem of households and firms. Although households differ with respect to their access to financing, the preferences of the liquidity-constrained and forward-looking households are the same. We assume that in the United States, emerging Asia, the euro area, and the rest of the world the share of liquidity-constrained consumers is 25 percent. The share is higher in Japan at 40 percent. The United States, the most impatient region, has the lowest discount factors and highest real interest rate (0.996 and 3.64 percent, respectively). Emerging Asia is the most patient region with the highest discount factor and lowest real interest rate (0.998 and 3.13 percent, respectively). All other regions have a discount rate of 0.997 and real interest rate of 3.13. For all regions, we assume a unitary elasticity of intertemporal substitution in consumption (i.e., logarithmic

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<sup>4</sup> Intervention is assumed to be nonsterilized.

<sup>5</sup> All parameter values in these tables refer to the equations in the technical appendix of Faruqee and others (2005). Unless otherwise stated, the same parameter values apply to all regions.

period utility). The parameter that governs habit persistence in consumption is set at 0.85. For labor, we assume a low Frisch elasticity of 0.40 in the long run, coupled with lower habit persistence of 0.75.

The elasticity of substitution between labor and capital is set at 0.75 in both the tradable and nontradable sectors. This is slightly lower than the conventional (Cobb-Douglas) unitary assumption to help reduce the sensitivity of capital to changes in its relative price. The bias towards the use of capital is calibrated to achieve a relatively high investment share of GDP in emerging Asia and a low share in the United States, in line with their respective historical averages (Table 2). In all regions, the nontradable sector (e.g., services) is assumed to be less capital-intensive than the tradable sector (e.g., manufacturing). The depreciation rate is assumed to be 2 percent per quarter across all regions (8 percent per year).

The dynamics of the model are governed by the nominal and real rigidities described in Table 3. The price adjustment cost parameter is set at 400 and is roughly equivalent to a four-quarter contract length under Calvo-style pricing. The adjustment cost parameter in investment is set based on the estimation of a closed economy version of GEM for the United States. The adjustment cost parameter on imports is set at 0.95 to replicate typical sluggish reaction of import volumes to movements in demand and relative prices.

There are separate markups on tradable and nontradable goods (Table 4) since firms have pricing power under monopolistic competition. We use estimates for the price markups from Martins, Scarpetta, and Pilat (1996) in the case of the United States, Japan, the euro area, and the rest of the world. The U.S. bloc has the lowest price markup, indicating the greatest degree of competition, while Japan and the euro area have the highest. For emerging Asia, the markups reflect preliminary estimates done at the IMF for a few countries of this bloc. In the labor market, we assumed agents have the same pricing power, yielding a 20 percent wage markup in all regions (Table 4).

The parameterization of the reaction functions are shown in Table 5. The United States, Japan, the euro area, and the rest of the world all follow a nonaggressive inflation-forecast-based (IFB) rule. We use a coefficient of 0.8 on the lagged short-term interest and a weight of 0.5 on the three-quarter-ahead gap between inflation and its target. The year-on-year CPI inflation target is assumed to be fixed at 2 percent for Japan, the euro area, and the rest of the world, and somewhat higher, at 2.5 percent, for the United States. Thus, both the baseline and the alternative scenarios assume that Japan has emerged from the liquidity trap, deflation has ended, and the interest rate channel of monetary policy is fully effective.<sup>6</sup> Emerging Asia is assumed to pursue a fixed nominal exchange rate against the U.S. dollar.

The calibration of each region's external sector is reported in Table 6. Using the IMF's Direction of Trade Statistics on merchandise trade, the national accounts data on the imports of goods and services, and the United Nations' Commodity Trade Statistics (COMTRADE) data on each region's imports of consumption and investment goods, a disaggregated steady-

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<sup>6</sup> While this is not the current situation, this assumption is plausible in the medium term.



state matrix delineating the pattern and composition of trade for all regions' exports and imports was derived. All the weight coefficients in the demand function for imports in Table 1 and the regional composition of imports in Table 6 were derived on the basis of this trade matrix. For the corresponding trade elasticities, we assume that the elasticity of substitution between domestically produced and imported tradable (consumption and investment) goods is 2.5. The elasticity of substitution between (consumption and investment) goods from different regions is set at 1.5, consistent with existing estimates of import elasticities. The elasticity of substitution between tradables and nontradables is assumed to be 0.5.

The assumptions on the long-run behavior of net foreign assets (NFAs) are also in Table 6. We assume that a permanent 1 percentage point of GDP increase in government debt leads to a 0.5 percentage point of GDP increase in the net foreign liability position of all regions, except in Japan where we assume this elasticity is 0.2. This is consistent with the elasticities derived in overlapping generations models with Blanchard-Weil-Yaari formulation, which range from roughly 0.40 to 0.80. In the case of Japan, the assumption reflects its historically strong portfolio home bias. In addition, when the United States expands its net foreign liabilities, the purchase of this new issuance by each region reflects net foreign asset holdings of U.S. assets in recent years, assigning 24 percent of new issuance to emerging Asia, and 45 percent to Japan, 5 percent to the euro area, and 15 percent to rest of the world.

### III. SCENARIOS

The simulation analysis compares a baseline and two alternative scenarios, which are based on different assumptions for fiscal policy and productivity growth in Japan. It is important to note up front that these scenarios are illustrative and should not be interpreted as forecasts or exhaustive of the possible policy options for Japan.

The baseline scenario is one in which a global external imbalance first emerges and then unwinds gradually over time. This baseline thus supplies a benchmark against which to compare the impact of alternative policies in Japan.

A "cocktail" of shocks, starting in 2001, reproduces the imbalance in the different regions of the world as of 2004Q4, in line with the analyses reported in the April and October 2005 *World Economic Outlook*, as well as Faruqee and others (2005).<sup>7</sup> The world economy then settles on a new, steady-state equilibrium as these shocks, some of which are permanent, unfold. The main ingredients of this "cocktail" are (i) lower saving in the United States, matched by higher saving in the rest of the world; (ii) productivity growth differentials among different regions of the world economy, and (iii) exchange rate rigidity in emerging Asia.

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<sup>7</sup> Our baseline stylizes the persistence of the global current account imbalance, started in 1996, well into the 2000s and its possible resolution. See Hunt and Rebucci (2005) for an analysis of the causes of the global external imbalance in the second half of the 1990s.

Lower U.S. public saving in the United States envisages an increase of the government deficit from 2.2 percent of GDP in 2001 to 4.3 percent of GDP in 2005. Subsequently, the U.S. deficit is assumed to fall gradually in line with the September 2004 WEO forecast, reaching 2.7 percent in 2010. As a result, U.S. government debt increases from 50 percent in 2001 to 60 percent in 2010.

Lower U.S. private saving is generated by an exogenous reduction in the desired level of NFAs, matched by a corresponding increase in the rest of the world. In line with current portfolio shares of U.S. assets worldwide, we assume that a 1 percent fall in U.S. NFAs (in U.S. GDP terms) is absorbed by a 0.24 percent increase in emerging Asia's desired NFAs, 0.45 percent increase of desired NFAs in Japan, a 0.05 percent increase in the euro area, and finally a 0.26 percent rise in NFAs in the rest of the world (all measured in U.S. GDP terms).

Slightly higher public saving in Japan is achieved by a gradual fiscal consolidation proceeding at a pace of  $\frac{1}{2}$  percent of GDP per year over a 10-year period, in line with current policy projections by the Japanese authorities. The ratio of net general government debt to GDP rises to 150 percent over the long term, from about 80 percent in 2004. Fiscal policies in other regions is passive, following rules tuned to meet the long-run debt targets in Table 2.

Trend productivity growth is 2 percent in the model. In the baseline, we assume that emerging Asia grows faster than 2 percent up to 2015, in line with current growth forecasts, while productivity growth in Japan is slower at 1.5 percent per year until 2015. U.S. productivity growth is assumed to be at its trend level in the baseline.

In the first alternative scenario ("Structural and Fiscal Reforms"), productivity growth in Japan gradually increases by  $\frac{1}{2}$  percentage point of GDP a year cumulatively, starting in 2005 and reaching 2 percent by 2010. Also, a supplementary adjustment in the primary deficit of a  $\frac{1}{4}$  percentage point of GDP per year over a 10-year period is simulated, reducing the primary deficit by an additional  $2\frac{1}{2}$  percentage points relative to the baseline, with a lower debt-to-GDP target of 110 percent in the long run.

In the second alternative scenario ("Larger Structural Reform Payoffs"), an additional  $\frac{1}{2}$  percentage point increase in productivity growth is considered compared with the previous scenario (with a total gradual increase of 1 percentage point between 2005 and 2010), while the primary deficit path and the long-term debt target are the same as in the baseline scenario.

#### **IV. SIMULATION RESULTS**

In the baseline scenario, the U.S. current account deficit falls by about 2.5 percent of GDP consistent with having a higher level of net foreign liabilities to service. The improvement in the current account results from a combination of higher U.S. real interest rates that cool consumption and investment growth, and a weaker U.S. dollar that boosts net exports. The real exchange rate depreciates by about 10 percent. In the medium term, this results in output growing below trend. All other regions experience opposite adjustment patterns. As the U.S.

contracts and becomes more competitive to adjust to its new level of NFAs, they expand, seeing weakening current accounts and gradually appreciating exchange rates.<sup>8</sup>

Figures 1a and 1b report the simulation results for the first alternative scenario. These results suggest that faster productivity growth would both facilitate the reduction of Japan's fiscal imbalance and largely offset the adverse impact of fiscal consolidation on output growth and the external imbalance in the short run. Output growth declines about  $\frac{1}{4}$  percentage point for only the first year, and thereafter follows the gradual increase in productivity growth. The current account surplus declines only about 0.1 percent of GDP initially and thereafter increases  $\frac{1}{2}$  percent of GDP (about \$25 billion).

The direct effect of faster productivity growth and fiscal adjustment lowers Japan's government debt-to-GDP ratio by about 40 percentage points over 15 years. The gradual increase in productivity growth lifts current and future factor returns, and hence stimulates investment and consumption through a wealth effect, despite the negative effect on domestic demand from increased taxes. Overall, the strengthening of demand raises imports and narrows the trade surplus. Given the small size of the productivity improvement, the decline in Japan's external surplus is short-lived as it is dominated by the impact of fiscal consolidation in the medium-term.

With only a gradual supply-side response to the phased-in increase in productivity, in the near term there is excess demand for both domestically and foreign-produced goods, and domestic prices rise relative to foreign prices. This induces a temporary appreciation of the exchange rate, reinforcing the impact of higher domestic demand on external balances. Over the medium term, however, supply catches up with demand because of both the gradual increase in capacity and the negative effect of fiscal consolidation on demand. Accordingly, domestic prices decline, leading to a depreciation of the exchange rate back toward the baseline that dampens the negative effects of higher demand on external balances.

Inflation is mainly driven by the changes in the exchange rate, as inflation falls initially and then rises subsequently. Rising inflationary pressure calls for a tighter monetary stance, which somewhat dampens the depreciation pressure on the exchange rate.

However, because debt declines in relation to GDP, the interest rate is lower than it would otherwise be given that higher debt places a premium on the interest rate. With less crowding out in the transition and a higher capital stock, this also implies that output is slightly higher than it would otherwise be.

Spillovers to the rest of the world are negligible in this case (Table 7).

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<sup>8</sup> The simulation results for the baseline are not reported because the results for the alternative scenarios are not particularly sensitive to the choice of the baseline. A similar baseline is also presented by Faruquee and others (2005) and in the September 2005 *World Economic Outlook*.

Figures 2a and 2b report the simulation results for the second alternative scenario. Faster productivity growth than in the first scenario could contribute to a near-term reduction in Japan's current account surplus, and hence help reduce global current account imbalances. A gradual 1 percentage point increase in Japan's productivity growth would on impact reduce its trade and current account surpluses by about  $\frac{1}{2}$  percentage point of GDP (about \$25 billion) and  $\frac{3}{4}$  percentage point of GDP (about \$35 billion), respectively.

In this case, the current account surplus narrows more than with a smaller increase in productivity growth because the positive wealth effects stimulate investment and consumption to a larger extent. This decline in the current account balance is magnified by a larger appreciation of the exchange rate than under the first alternative scenario.

The rapid response of demand relative to supply puts upward pressure on inflation, calling for a tighter monetary stance and therefore higher interest rates, which reinforces the initial appreciation of the exchange rate.

Under this second scenario, the spillovers to the rest of the world would be marginally larger (Table 8). In the United States, output growth is virtually unchanged as a temporary reduction in domestic demand is partly offset by an improvement in the trade balance. Domestic demand falls because investment responds to interest rates, which rise to curb the inflationary effects of the initial depreciation of the U.S. dollar. However, this deterioration of domestic demand, along with the depreciation of the dollar, causes the U.S. trade deficit to decline. Together with positive valuation effects arising from the dollar depreciation, the decline in the trade deficit improves the U.S. NFAs position in the short run.

In the euro area, the transmission mechanism is similar to that in the United States, although the spillovers are very small in light of the region's more limited trade linkages with Japan.

In emerging Asia, output growth picks up slightly in the short run, mainly due to an increase in both domestic and net external demand. Domestic demand improves mainly due to higher investment following a decline in real interest rates. The exchange rate—which is pegged to the U.S. dollar—depreciates, boosting export growth and slowing import growth. The improvement in the current account is limited and does not lead to a significant change in the NFAs position in relation to GDP.

## V. CONCLUSIONS

This paper has presented an illustration of the possible response of the domestic and world economies to productivity-enhancing reforms and fiscal adjustment in Japan. There are three main conclusions:

- Such a combination of actions would contribute to reducing Japan's fiscal imbalance, without jeopardizing the economic recovery or exacerbating existing global external imbalances.

- If the increase in productivity growth were more substantial than those currently projected, Japan's internal balance would improve further, output growth would be stronger, and the external surplus would decline.
- In both instances, however, the spillovers to the rest of the world appear modest, partly reflecting the small size of the shocks and Japan's limited share of the world economy.

The analysis abstracted from a number of complications, including deflation, sterilized intervention in emerging Asia, and demographic change in Japan. Demographic change is a particularly fruitful area of future research.<sup>9</sup> Other things equal, it is likely to make fiscal adjustment more desirable and impart a downward trend in Japanese private savings that may help reduce Japan's current account surplus independently of Japan's fiscal or productivity growth path (Batini, Callen, and McKibbin, 2005).

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<sup>9</sup> Batini and others (2005), for instance, find that more than 1/2 of Japan's today's current account surplus is the result of demographic factors that, going forward, will push Japan toward smaller surpluses.

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Table 1. Households and Firms Behavior

	US	JA	AS	EA	ROW
Rate of time preference	0.996	0.997	0.998	0.997	0.0997
Depreciation rate	0.02	0.02	0.02	0.02	0.02
Intertemporal elasticity of substitution	1.00	1.00	1.00	1.00	1.00
Habit persistence in consumption	0.85	0.85	0.85	0.85	0.85
Inverse of the Frisch elasticity of labor	2.50	2.50	2.50	2.50	2.50
Habit persistence in labor	0.75	0.75	0.75	0.75	0.75
Tradable Intermediate Goods					
Substitution between factors of production	0.75	0.75	0.75	0.75	0.75
Bias towards capital	0.60	.73	0.65	0.60	0.60
Nontradable Intermediate Goods					
Substitution between factors of production	0.75	0.75	0.75	0.75	0.75
Bias towards capital	0.55	.70	0.60	0.55	0.55
Final consumption goods					
Substitution between domestic and imported goods	2.50	2.50	2.50	2.50	2.50
Bias towards domestic goods	0.87	0.49	0.15	0.04	0.20
Substitution between domestic tradables and nontradables	0.50	0.50	0.50	0.50	0.50
Bias towards tradable goods	0.35	0.36	0.37	0.36	0.30
Final investment goods					
Substitution between domestic and imported goods	2.50	2.50	2.50	2.50	2.50
Bias towards domestic goods	0.89	0.63	0.06	0.92	0.14
Substitution between domestic tradables and nontradables	0.50	0.50	0.50	0.50	0.50
Bias towards tradable goods	0.74	0.77	0.82	0.75	0.73

US = United States; JA = Japan; AS = Emerging Asia

Table 2. Steady-state National Accounts in the Baseline Scenario (Ratio to GDP)

	US	JA	AS	EA	ROW
Private Consumption	68.96	59.64	69.33	58.99	67.83
Forward-looking consumers	62.64	52.56	54.71	54.73	62.00
Liquidity-constrained consumers	6.31	7.08	14.60	4.25	5.83
Private Investment	15.94	21.08	19.34	15.32	15.73
Public Expenditure	14.51	19.78	12.1	25.5	16.8
Trade balance	0.60	-0.41	-0.64	0.18	-0.37
Imports	11.46	11.49	26.73	17.41	22.98
Consumption Goods	7.33	8.06	11.32	15.01	12.13
Investment Goods	4.13	3.43	15.40	2.40	10.85
Government Debt	61.5	80.0	55.0	60.0	60.0
Net Foreign Assets	-51.08	55.03	49.02	-11.3	26.4
Share of World GDP (percent)	30.05	11.48	9.83	22.80	25.84

Table 3. Nominal and Real Rigidities

	US	JA	AS	EA	ROW
<b>Real Rigidities</b>					
Capital accumulation	1.00	1.00	1.00	1.00	1.00
Investment changes	78	78	78	78	78
Imports of consumption goods	0.95	0.95	0.95	0.95	0.95
Imports of investment goods	0.95	0.95	0.95	0.95	0.95
<b>Nominal Rigidities</b>					
Wages for liquidity-constrained consumers	400	400	400	400	400
Wages for forward-looking consumers	400	400	400	400	400
Price of domestically-produced tradables	400	400	400	400	400
Price of nontradables	400	400	400	400	400
Price of imported intermediate goods	400	400	400	400	400

Table 4. Price and Wage Markups

	US	JA	AS	EA	ROW
<b>Tradables Price Markups</b>					
	1.15	1.26	1.14	1.18	1.18
<b>Nontradables Price Markups</b>					
	1.28	1.41	1.27	1.45	1.33
<b>Wage Markup</b>					
	1.20	1.20	1.20	1.20	1.20

Table 5. Monetary Policy

	Other Blocks	Emerging Asia
	IFB Rule*	Fixed Exchange Rate
Interest rate at t-1	0.8	1.0
Inflation gap at t+3	0.5	0.0
Change in the nominal exchange rate at t	0.0	1,000,000 (proxy for $\infty$ )

\* IFB = Inflation-Forecast-Based



Table 6. International Linkages

	US	JA	AS	EA	RC
Substitution between consumption imports from different regions	1.5	1.5	1.5	1.5	1.5
Bias towards imported consumption goods from					
US	...	0.45	0.23	0.04	0.39
JA	0.06	...	0.12	0.03	0.01
AS	0.17	0.38	...	0.14	0.02
EA	0.16	0.10	0.25	...	0.59
ROW	0.61	0.07	0.41	0.79	...
Substitution between investment imports from different regions	1.5	1.5	1.5	1.5	1.5
Bias towards imported investment goods from					
US	...	0.53	0.26	0.26	0.37
JA	0.07	...	0.13	0.05	0.04
AS	0.28	0.25	...	0.14	0.16
EA	0.16	0.13	0.12	...	0.43
ROW	0.50	0.08	0.49	0.55	...
Net Foreign Liabilities					
Maximum of financial intermediation cost function	0.05	0.05	0.05	0.05	0.05
Steepness of financial intermediation cost function	0.10	0.10	0.10	0.10	0.10
Share related to domestic government debt	0.50	0.20	0.50	0.50	0.50
Share of foreign-held US government debt	0.15	0.45	0.24	0.05	...

Table 7. International Spillover of Structural and Fiscal Reforms  
(Percentage deviation from baseline)

	2005	2010	2015	2020
Japan				
Real GDP (level)	-0.2	0.7	2.5	5.3
Current account (percent of GDP)	-0.1	0.8	0.7	0.6
Government debt (percent of GDP)	0.3	-5.8	-17.8	-36.8
United States				
Real GDP (level)	0.0	0.0	0.0	0.1
Current account (percent of GDP)	0.0	-0.2	-0.2	-0.2
Euro area				
Real GDP (level)	0.0	0.0	0.0	0.0
Current account (percent of GDP)	0.0	0.0	0.0	0.0
Emerging Asia				
Real GDP (level)	0.0	-0.1	0.0	0.1
Current account (percent of GDP)	0.0	0.0	0.0	0.0
Rest of the world				
Real GDP (level)	0.0	0.0	0.0	0.0
Current account (percent of GDP)	0.0	0.0	0.0	0.0

Table 8. International Spillover of Larger Structural Reforms Payoffs  
(Percentage deviation from baseline)

	2005	2010	2015	2020
Japan				
Real GDP (level)	0.0	3.1	7.8	14.6
Current account (percent of GDP)	-0.7	-0.1	0.3	0.4
Government debt (percent of GDP)	0.1	-4.3	-11.0	-22.6
United States				
Real GDP (level)	0.0	-0.1	0.0	0.1
Current account (percent of GDP)	0.1	0.0	-0.1	-0.1
Euro area				
Real GDP (level)	0.0	0.0	0.1	0.1
Current account (percent of GDP)	0.0	0.0	0.0	0.0
Emerging Asia				
Real GDP (level)	0.2	0.1	0.1	0.2
Current account (percent of GDP)	0.1	0.0	0.0	0.0
Rest of the world				
Real GDP (level)	0.0	0.0	0.0	0.1
Current account (percent of GDP)	0.0	0.0	0.0	0.0

Figure 1a. Structural and Fiscal Reforms  
(Percentage deviation from baseline)

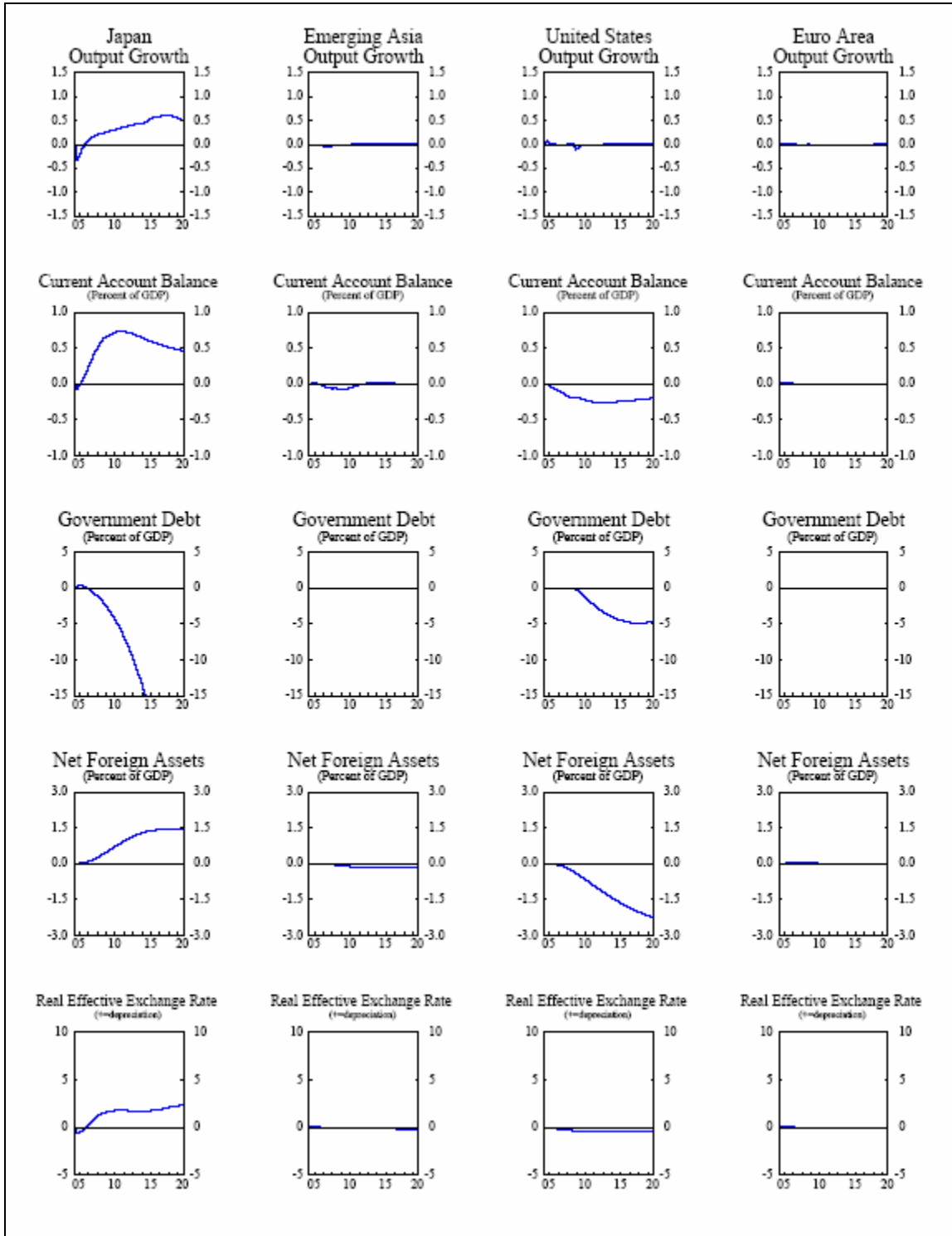


Figure 1b. Structural and Fiscal Reforms  
(Percentage deviation from baseline)

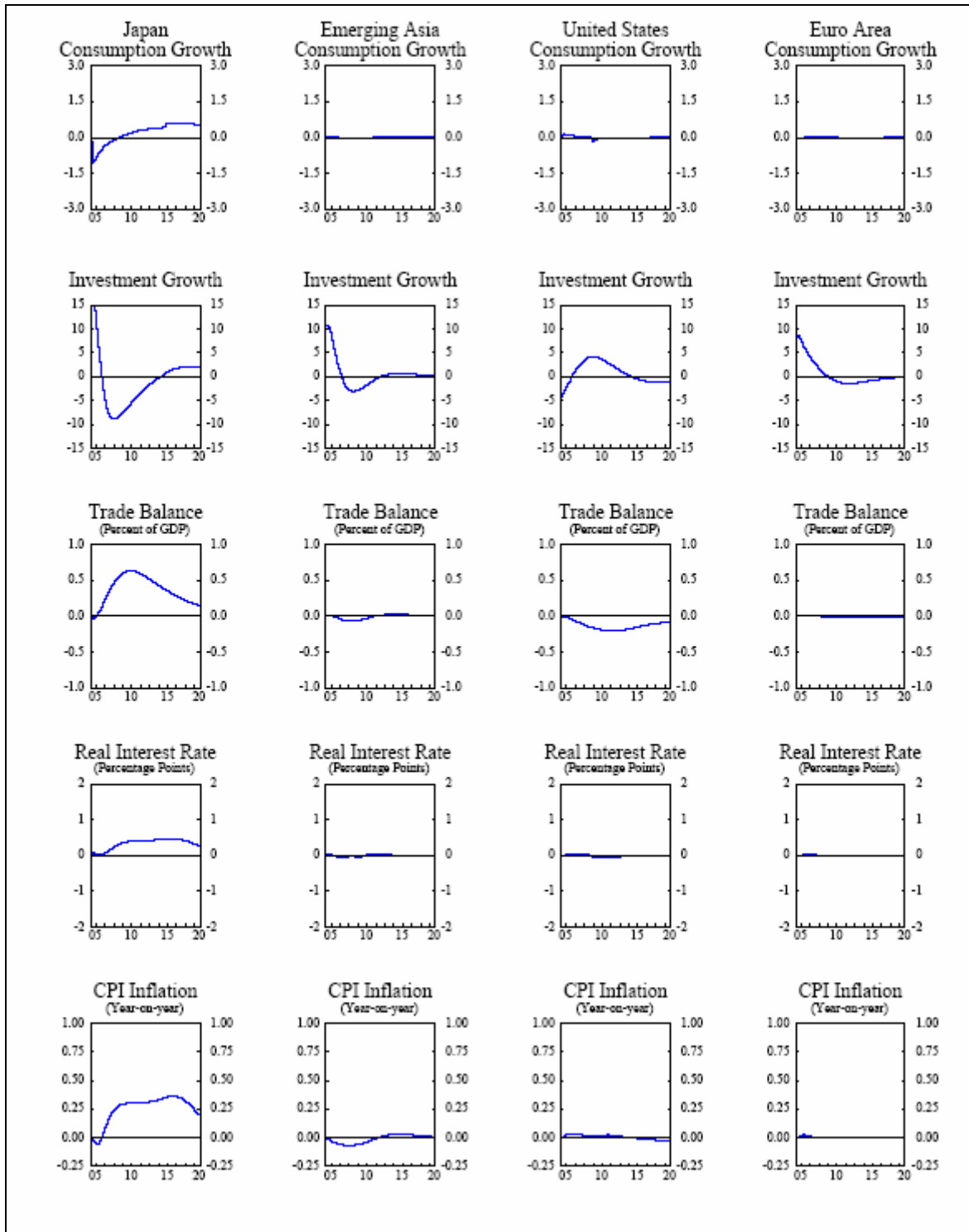


Figure 2a. Larger Structural Reform Payoffs  
(Percentage deviation from baseline)

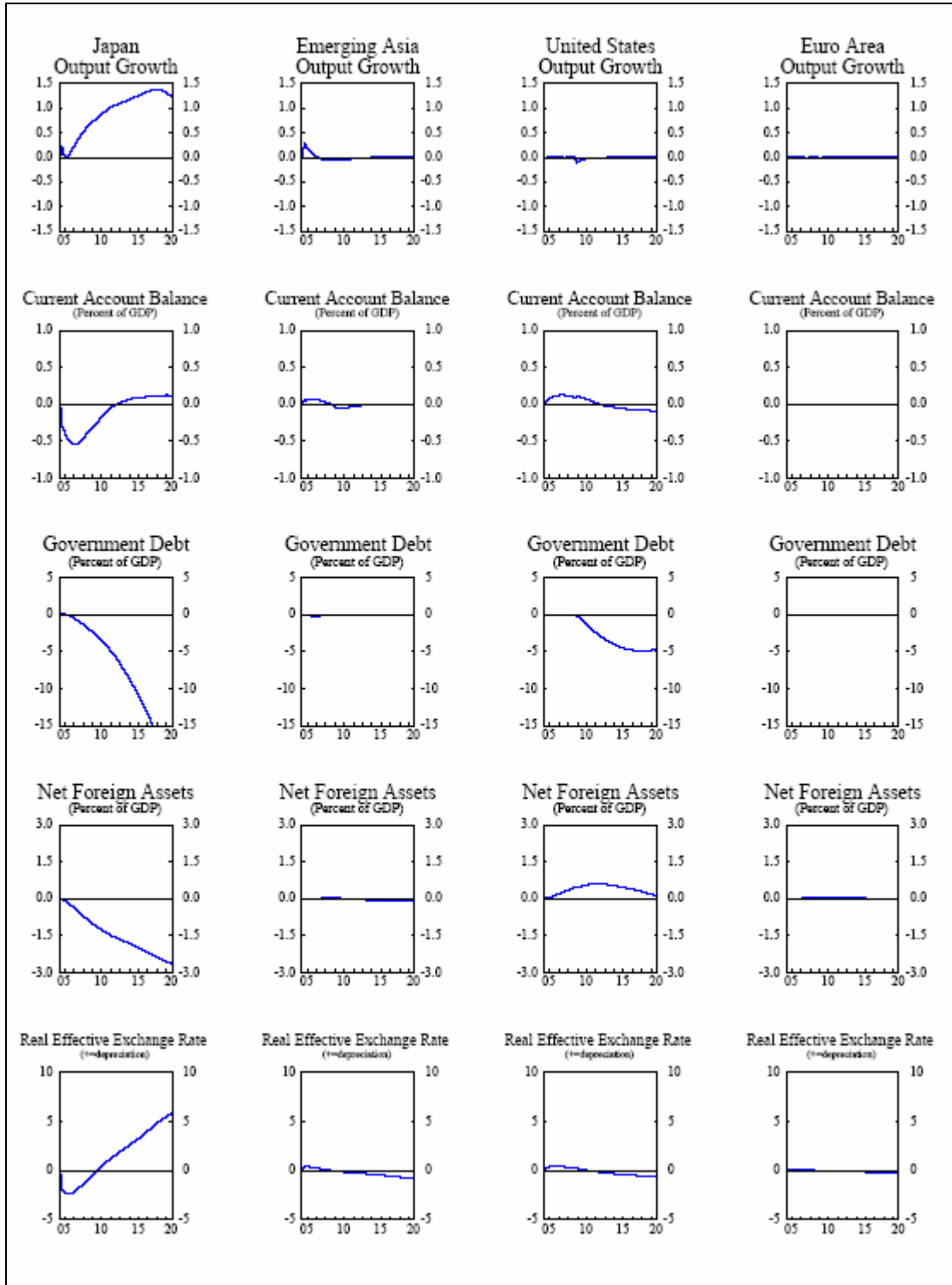


Figure 2b. Larger Structural Reform Payoffs  
(Percentage deviation from baseline)

