Headwinds and Turbulence since 1990s: Japan’s Economic and Fiscal Performance over the Next Decade

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1. Macroeconomic Outlook in United States
2. Macroeconomic Outlook in Japan
3. Slowdown in Growth in Japan
4. Where Are We Now?
5. Low Hanging Fruit
6. Fourth Arrow: Aging
7. How Large Is the Aging Related Problem?
8. An Accounting Model
9. Path for Future Research
23 Years of Slowdown in Economic Growth
Real GDP per capita in the U.S. and Japan

- Catching up until 1990
- Lost decade
- Slightly worse since then
Macroeconomic Outlook in United States: CBO Estimates

Summary Indicators CY 2014

**ECONOMIC PROJECTIONS FOR CY 2014**
(As of August 2014)

- REAL GDP GROWTH (Q4/Q4) 1.5%
- INFLATION (PCE Price Index, Q4/Q4) 1.9%
- UNEMPLOYMENT RATE (Q4) 5.9%
- INTEREST RATE (3-Month Treasury Bills) 0.1%
Macroeconomic Outlook in United States: CBO Estimates
Key Indicators to 2024

![Graph showing Actual Values and CBO's Projections of Key Economic Indicators](image-url)
Macroeconomic Outlook in United States: CBO Estimates

Debt to GDP: 1790-2039

Federal Debt Held by the Public

Percentage of Gross Domestic Product

Source: Congressional Budget Office. For details about the sources of data used for past debt held by the public, see Congressional Budget Office, Historical Data on Federal Debt Held by the Public (July 2010), www.cbo.gov/publication/21728.
## Macroeconomic Outlook in United States: CBO Estimates

### Projected Spending and Revenues

<table>
<thead>
<tr>
<th>Spending</th>
<th>Percentage of Gross Domestic Product</th>
<th>2014</th>
<th>2024</th>
<th>2039</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noninterest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Security</td>
<td></td>
<td>4.9</td>
<td>5.6</td>
<td>6.3</td>
</tr>
<tr>
<td>Medicare (Net of offsetting receipts)</td>
<td></td>
<td>3.0</td>
<td>3.2</td>
<td>4.6</td>
</tr>
<tr>
<td>Medicaid, CHIP, and exchange subsidies</td>
<td></td>
<td>1.9</td>
<td>2.7</td>
<td>3.4</td>
</tr>
<tr>
<td>Other mandatory</td>
<td></td>
<td>2.5</td>
<td>2.2</td>
<td>1.7</td>
</tr>
<tr>
<td>Discretionary</td>
<td></td>
<td>6.8</td>
<td>5.1</td>
<td>5.2</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td>19.1</td>
<td>18.8</td>
<td>21.2</td>
</tr>
<tr>
<td>Net interest</td>
<td></td>
<td>1.3</td>
<td>3.3</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Total Spending</strong></td>
<td></td>
<td>20.4</td>
<td>22.1</td>
<td>25.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revenues</th>
<th>Percentage of Gross Domestic Product</th>
<th>2014</th>
<th>2024</th>
<th>2039</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual income taxes</td>
<td></td>
<td>8.0</td>
<td>9.4</td>
<td>10.5</td>
</tr>
<tr>
<td>Payroll taxes</td>
<td></td>
<td>6.0</td>
<td>5.8</td>
<td>5.7</td>
</tr>
<tr>
<td>Corporate income taxes</td>
<td></td>
<td>2.0</td>
<td>1.8</td>
<td>1.8</td>
</tr>
</tbody>
</table>
| Excise taxes, estate and gift taxes, and 
  other sources of revenues        |                                      | 1.5  | 1.3  | 1.4  |
| **Total Revenues**                |                                      | 17.6 | 18.3 | 19.4 |

<table>
<thead>
<tr>
<th>Deficit</th>
<th>Percentage of Gross Domestic Product</th>
<th>2014</th>
<th>2024</th>
<th>2039</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excluding net interest</td>
<td></td>
<td>-1.5</td>
<td>-0.5</td>
<td>-1.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>-2.8</td>
<td>-3.7</td>
<td>-6.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Debt Held by the Public at the End of the Year</th>
<th>Percentage of Gross Domestic Product</th>
<th>2014</th>
<th>2024</th>
<th>2039</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>74</td>
<td>78</td>
<td>106</td>
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</table>

<table>
<thead>
<tr>
<th>Memorandum:</th>
<th>Percentage of Gross Domestic Product</th>
<th>2014</th>
<th>2024</th>
<th>2039</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Medicare Spending</td>
<td></td>
<td>3.5</td>
<td>3.9</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Source: Congressional Budget Office.
Macroeconomic Outlook in United States: CBO Estimates

Components of Total Revenues
Macroeconomic Outlook in United States: CBO Estimates

Components of Total Spending

[Graph showing components of total spending as a percentage of Gross Domestic Product from 1999 to 2039. The graph includes categories such as Federal Spending on the Major Health Care Programs, Other Noninterest Spending, Social Security, and Net Interest.]
Macroeconomic Outlook in United States: CBO Estimates

Debt in the Long Term

![Graph showing debt held by the public, total spending, and total revenues over time from 1999 to 2039. The graph includes actual and extended baseline projection lines for federal debt held by the public, spending, and revenues as a percentage of gross domestic product. The data is from the Congressional Budget Office, July 2014.]
Macroeconomic Outlook in United States: CBO Estimates

Timing is Everything

The Timing and Size of Policy Changes Needed to Make Federal Debt Meet Two Goals

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1.2</td>
</tr>
<tr>
<td>2020</td>
<td>1.5</td>
</tr>
<tr>
<td>2025</td>
<td>2.1</td>
</tr>
</tbody>
</table>

To make federal debt held by the public in 2039 equal...

- Its current percentage of GDP (74 percent)
- Its average percentage of GDP during the past 40 years (39 percent)

Source: Congressional Budget Office.
Note: GDP = gross domestic product.
Projected rise in the dependency ratio from 24% to 44% by 2088

Long run actuarial balance can be achieved by

- an immediate, additional 2.66% payroll tax, on top of the 12.4% current OASDI tax rate (HI 2.9%)
- a 16.5% permanent reduction in benefits, starting with the 2014 eligibles (from the current average replacement rate of about 42%)
When current social security arrangements are maintained and a consumption tax is used to raise funds to finance the fiscal burden due to aging, a new federal consumption tax rate of nearly 10% is required.

Raising the payroll tax by 2.66% is insufficient to bring about actuarial balance. An additional consumption tax rate of 7.76% is required.

Reducing benefits by 16.5% is insufficient to achieve actuarial balance. An additional consumption tax rate of 6.42% is needed.

Actuarial balance is achieved either by a 8.25% increase in the payroll tax rate or a 38.8% decrease in benefits.
23 Years of Growth Slowdown in Japan

Growth Accounting $Y = AK^{0.36}L^{0.64}$

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$Y$</td>
<td>4.42%</td>
<td>1.27%</td>
<td>0.84%</td>
<td>1.03%</td>
</tr>
<tr>
<td>$K$</td>
<td>2.31%</td>
<td>2.39%</td>
<td>1.25%</td>
<td>1.74%</td>
</tr>
<tr>
<td>$L$</td>
<td>0.44%</td>
<td>-0.82%</td>
<td>-0.46%</td>
<td>-0.62%</td>
</tr>
<tr>
<td>$A$</td>
<td>3.31%</td>
<td>0.94%</td>
<td>0.69%</td>
<td>0.80%</td>
</tr>
<tr>
<td>$Y/N$</td>
<td>3.58%</td>
<td>1.00%</td>
<td>0.82%</td>
<td>0.90%</td>
</tr>
</tbody>
</table>

$Y$ : Real GDP
$A$ : Total Factor Productivity
$K$ : Private Capital Stock
$L$ : Total Hours Worked
$N$ : Total Population
Macroeconomic Outlook in Japan: ESRI Estimates

Growth: Reference vs Vitalization

Real GDP Growth Rate

Nominal GDP Growth Rate
Macroeconomic Outlook in Japan: ESRI Estimates

Deficits: Reference vs Vitalization

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**Primary Balance of Central and Local Governments Combined** (ratio to nominal GDP)

- **Economic Revitalization Case**
- **Reference Case**
- **Targets of the Primary Balance**

*Excluding the expenditures and the fiscal resources for the recovery and reconstruction measures.*

**Outstanding Debt** (ratio to nominal GDP)

- **Economic Revitalization Case**
- **Reference Case**

*Excluding the reconstruction bonds.*
Basic Issue: Why 25 Years of Slowdown in Economic Growth?

Explanations

- Policy mistakes
- Delay in bank recapitalization
- Lack of structural reform
23 Years of Slowdown in Economic Growth

A Large Literature: Very Good Analysis

- Beason and Weinstein (1996) on industrial policy
- Hamada, Kashyap, and Weinstein (2011) on long term stagnation
- Aoki (2012) on sectoral misallocation in Japan, Italy, France and U.S.
- Fujii and Nozawa (2013) on misallocation of capital
23 Years of Slowdown in Economic Growth

- Firm-level regressions that show that the increase in ‘zombies’ depressed the investment and employment growth of ‘non-zombies’
- Idea: Zombies created congestion by NOT shedding labor and capital
- Growth slowdown especially significant in non-manufacturing where there were more zombies (construction, real estate, services)
- This reduced the overall total factor productivity
- Evergreening or zombie-lending prevented the efficient working of the job destruction/creation process
- Not a structural model, but quite convincing about the potential role of misallocation
Macroeconomic implications of size-dependent policies
When establishments differ in size, restricting size-expansions or encouraging small-shops leads to distortions
With subsidies to small establishments or taxes on large foot-print establishments (Walmart, Costco), the number of ‘mom-and-pop’ shops rises and per-establishment output falls
As a result, size-dependent policies generate microeconomic and allocative inefficiencies
23 Years of Slowdown in Economic Growth

- Well intended policies when managerial ability differs across individuals or firms
- Wouldn’t it be great to identify which ideas/abilities are good and subsidize them?
- If the government wants to maximize current productivity and output, it may want to ‘bet’ on ideas or industries or firms to subsidize; there will be gains in the short term
- If the ideas/abilities dissipate (randomly distributed over time) or if the receiving firms/managers no longer have incentive to innovate, then there will be losses in the long term
- Capital and labor will be misallocated $\rightarrow$ low TFP
Where is Japan Now?
2014 Bonenkai

<table>
<thead>
<tr>
<th>Recent Annual Economic Growth</th>
<th>U.S.</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>1.6%</td>
<td>−0.5%</td>
</tr>
<tr>
<td>2012</td>
<td>2.3%</td>
<td>1.8%</td>
</tr>
<tr>
<td>2013</td>
<td>2.2%</td>
<td>1.6%</td>
</tr>
<tr>
<td>2014</td>
<td>&gt; 2%</td>
<td>&lt; 0%</td>
</tr>
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</table>
# Where is Japan Now?

## 2014 Bonenkai

<table>
<thead>
<tr>
<th>Recent Quarterly Economic Growth</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Real</td>
<td>Nominal</td>
</tr>
<tr>
<td></td>
<td>GDP</td>
<td>GDP</td>
</tr>
<tr>
<td>U.S.</td>
<td>Japan</td>
<td>U.S.</td>
</tr>
<tr>
<td>2014 Q2</td>
<td>4.6%</td>
<td>-6.7%</td>
</tr>
<tr>
<td>2014 Q3</td>
<td>3.9%</td>
<td>-1.9%</td>
</tr>
</tbody>
</table>
Where is Japan Now?

Political Focus

- Abe government with super majority in the lower house
- New economic stimulus measures to be announced shortly
- ‘Drastic’ deregulation measures expected in agriculture, health care, and energy
Where is Japan Now?

What are the fundamental economic problems?

- Recession: immediate problem
- High debt to output: medium term problem
- Aging related fiscal adjustments: fourth arrow
- Third arrow: the most important problem
Where Should Japan Do?
Reform Business, Workplace, and Banking/Corporate Governance Practices
Where Can Japan Do?
Relatively Easy and Practical Administrative Changes

- Haidar and Hoshi 2014 ‘Implementing Structural Reforms in Abenomics: How to Reduce the Cost of Doing Business in Japan’

- Implement reforms that are administrative in nature (no new laws required) and unlikely to face strong opposition from special interests

- Easy to be # 9 among high-income OECD economies but difficult (needs new laws) to become # 3
Two significant challenges faced by Japan

- High (net) debt to output ratio (about 150%).
- Projected increase in government expenditures due to aging population.
  - Spending to output projected to rise by 7% of GDP due to increases in pension and health expenditures.

Need to explore size and consequences of fiscal responses to this problem.
Fourth Arrow
Population Pyramids from the Ministry of Health, Labor and Welfare
What should Japan do?
Demographic Changes and Macroeconomic Performance: Japanese Experiences
by Masaaki Shirakawa, 2012 May BOJ-IMES Conference

“The current difficulties come not from the continued population aging itself, but from the delayed response to it. On that ground, I emphasize that, if society correctly recognizes the challenges coming from demographic changes, and if society judges that changes in the systems are needed, we should find remedies in our hands. I offer a couple of options for possible changes if Japanese people are determined to take action.”

1. Increase the working age population (labor force): fertility, female labor force participation, older workers, foreign workers
2. Re-orient resources (capital and labor) toward the goods and services consumed by the elderly
3. Re-orient resources (business) to raise productivity with the help of globalization. I interpret this as a re-haul of workplace practices and microeconomic reforms?
The Standard Growth Model
Hansen and İmrohoroğlu (2013)

- Featuring:
  - Infinitely lived representative household makes consumption, labor supply and bond holding decisions
  - Cobb-Douglas production function
  - Government taxes income from labor, capital, bond holdings, and consumption, to finance expenditures on government purchases, transfer payments (including pensions) and interest payments on outstanding debt.
  - Markets are complete
  - Compute equilibrium transition paths under alternative fiscal policies
The Standard Growth Model
Hansen and İmrohoroğlu (2013)

Nature of the experiment
- When JGB/GNP goes above a threshold (250%), then a fiscal rule raises a tax rate (consumption or labor income or both) or implements an expanding the tax base (reduction in exemptions and deductions) for as long as necessary until a steady state is reached in the far distant future in which there is fiscal balance.
The Standard Growth Model

Hansen and İmrohoroğlu (2013): Needed Consumption Tax
Adjusting the consumption or labor income tax rate to achieve this, however, requires that taxes be set to unprecedentedly high levels—tax rates of 40-60%.

The lower end of this range is made possible if revenue equal to 8% of output can be raised through broadening the tax base.
Achieving Fiscal Balance in Japan
İmrohoroğlu, Kitao, and Yamada (2013) forthcoming in Internat’l Econ. Review

- Large scale overlapping generations model
- Individuals live from 1 to 111 years old
- Individuals differ in terms age, gender, job type, number of children, earnings, pensions
- Jobs: Regular, contingent, self-employed, unemployed
- Individuals’ earnings (for both male and females and for each job type) are estimated from Japanese data
- Individuals’ age-consumption profile also estimated from micro data
- Follow Japanese pension rules and tax policy closely
- Assume that markets are complete
Consumptions are then given by Permanent Income Hypothesis: at each age, consumption is a fraction of present value of discounted disposable income.

Asset holdings are computed as a residual from the individual’s flow budget constraint.

Aggregation done using the number of individuals in category.

Government budget and debt implications are calculated from 2010 to 2100.

Per capita GDP grows slower than GDP per working age population.
# Achieving Fiscal Balance in Japan

Pension Reform: Retirement at Age 70 and 10% Benefit Cut

<table>
<thead>
<tr>
<th>Year</th>
<th>(\frac{(B_t - F_t)}{Y_t})</th>
<th>(\frac{(G_t + TR_t - T_t)}{Y_t})</th>
<th>(\frac{(P_t - PR_t)}{Y_t})</th>
<th>(\frac{(r_{b,t} B_t - r_{f,t} F_t)}{Y_t})</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1.042</td>
<td>0.034</td>
<td>0.024</td>
<td>0.007</td>
</tr>
<tr>
<td>2020</td>
<td>1.487</td>
<td>0.014</td>
<td>0.014</td>
<td>0.011</td>
</tr>
<tr>
<td>2030</td>
<td>1.744</td>
<td>0.014</td>
<td>0.005</td>
<td>0.012</td>
</tr>
<tr>
<td>2040</td>
<td>2.022</td>
<td>0.017</td>
<td>0.005</td>
<td>0.013</td>
</tr>
<tr>
<td>2050</td>
<td>2.470</td>
<td>0.021</td>
<td>0.018</td>
<td>0.015</td>
</tr>
<tr>
<td>2060</td>
<td>3.013</td>
<td>0.024</td>
<td>0.019</td>
<td>0.018</td>
</tr>
</tbody>
</table>
Achieving Fiscal Balance in Japan
Sources of New Borrowing with a 20% Consumption Tax
Achieving Fiscal Balance in Japan
Male Labor Force Participation in Japan (Labor Force Survey)
Achieving Fiscal Balance in Japan
Female Labor Force Participation in Japan (Labor Force Survey)
Achieving Fiscal Balance in Japan
Male Earnings in Japan (BSWS)
Achieving Fiscal Balance in Japan
Female Earnings in Japan (BSWS)
Achieving Fiscal Balance in Japan

Sources of New Borrowing with Higher FLFP
Among the alternative scenarios employed:

- Pension reform (retirement age to 70 and benefits cut by 10%) reduces the pension deficit significantly.
- An increase in the consumption tax from the scheduled 10% to 20% turns the non-pension deficit into a surplus immediately and for several decades.
- An increase in the female labor force participation (both the participation rates and employment types of females similar to those of males) has a large impact.
- Only a combination of these and other outcomes may accomplish the task of achieving fiscal balance in Japan.
- Braun and Joines (2014): Overlapping Generations Model with optimizing agents gives similar results; raising the co-pay for the retirees to that of workers generates significant revenue.
Immigration

- An overlapping generations model that measures the tax revenue implications of a guest worker program
- Use (scarce) data on immigrants in Japan to calibrate
- Assume an age and ability distribution of guest workers
- Assume that there is annual inflow of $X$ number of guest workers of a given age and ability distribution who work for $Y$ number of years
- Calculate the fiscal impact, with varying values of $X$ and $Y$
Female Labor Force Participation

- Develop a general equilibrium model with age, gender, job type as key state variables including time use in market activities and home production by males and females
- Use micro data in Japan to calibrate the model to produce observed FLFP and other macro indicators
- Conduct experiments on the extent and size of government subsidies that reduce the cost of FLFP in many dimensions (child care, schooling, social norms, etc) like in France
- Calculate the effects of the increased FLFP on macro indicators and on fiscal issues
Misallocation of Resources
Third Arrow

- Identify the reasons for and the sources of misallocation of capital and labor
- Implement policies and develop institutions to minimize/eliminate these inefficiencies
- Only these reforms will deliver long run growth gains the effects of the increased FLFP on macro indicators and on fiscal issues
Abenomics: Focus on Third Arrow & Fourth Arrow

The Japan Times Explains

Selo İmrohoroğlu
Aging and Policy

December 22, 2014 Canon Institute for Global

The Japan Times
OPINION

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