

# The Crisis that Wasn't: How Japan Has Avoided a Bond Market Panic

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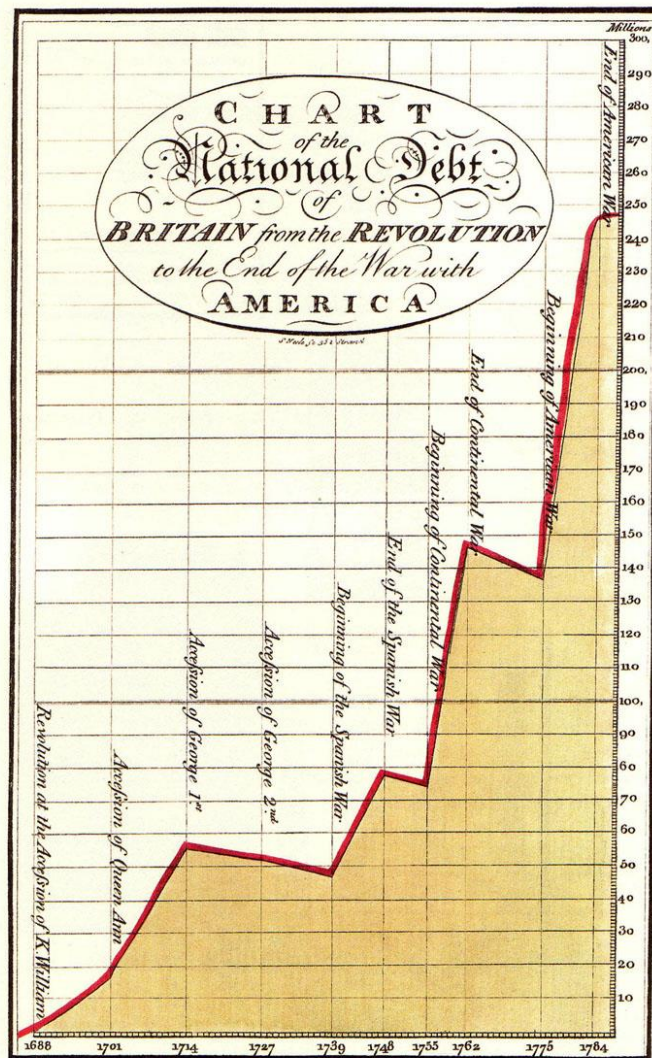
(Columbia University)

# The Origins of Fiscal Sustainability Calculations

- In 1786, 10 years after the publication of Adam Smith's *Wealth of Nations*, William Playfair published the first graph ever of an economic time series...

# A Plot Showing the British Government's accumulation of "ruinous debt"

This launched the modern analysis of Fiscal Sustainability

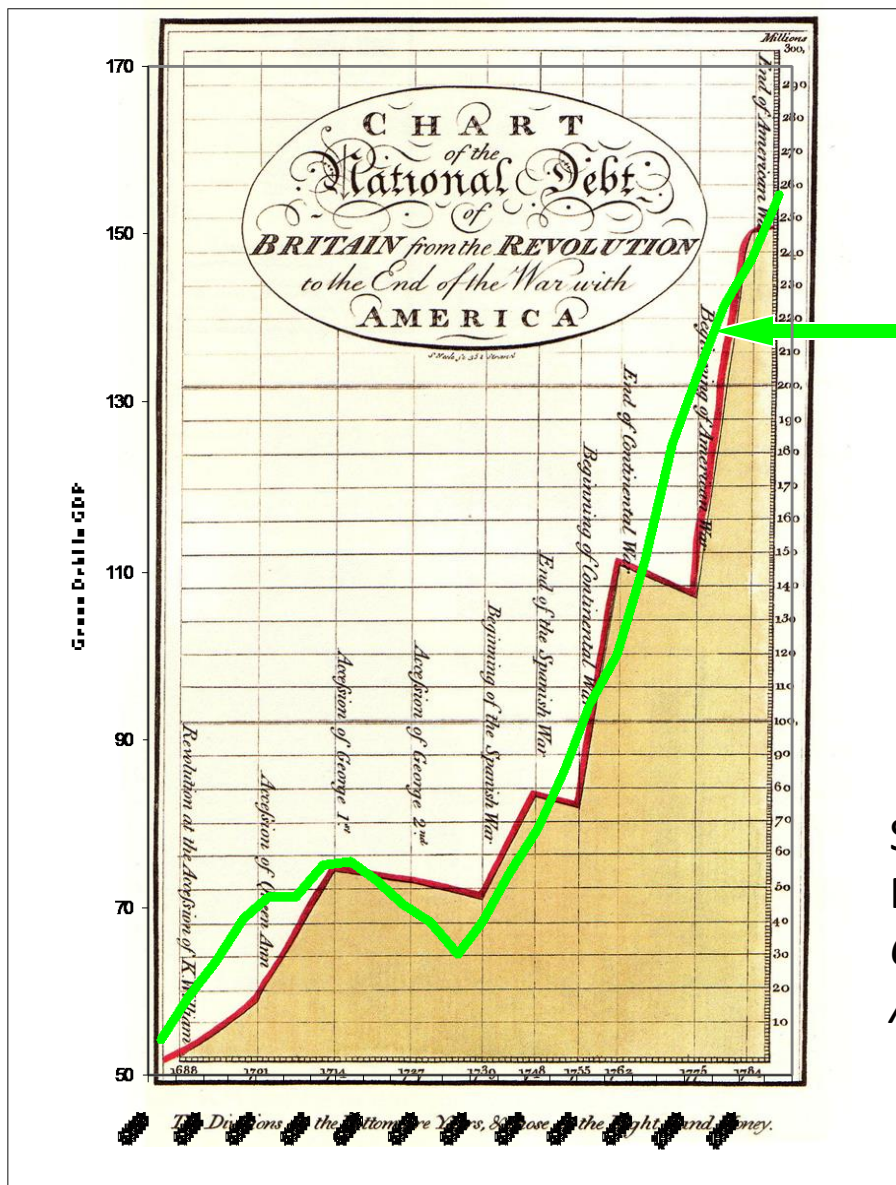


Source: Playfair (1786) *The Commercial and Political Atlas*

*The Divisions at the Bottom are Years, & those on the Right hand Money.*

# The Japanese Government's Accumulation of "ruinous debt" due to the bubble

Britain didn't default, and Japan hasn't either. Are there lessons from crises that don't happen?



Evolution of Japanese Gross Debt 1980-2003

Source: SourceOECD and Playfair (1786) *The Commercial and Political Atlas*

# The Crisis that Wasn't

- Starting about 20 years ago, economists began worrying about Japanese fiscal sustainability
  - See, for example, Takayama et al (1999) Asher and Dugger (2000), Ihuri, Doi, and Kondo (2001), Dekle (2002), Madsen (2002), Fukao (2003), Kotlikoff (2004), Doi, Hoshi, and Okimoto (2011), Imrohoroglu and Sudo (2011), Hoshi and Ito (2014), and Braun and Joines (2015).
  - Broda and Weinstein (2005) in “Happy News from Dismal Science” took a more optimistic view
- What explains the absence of a crisis and the continued low JGB interest rates?

# This Paper

- Explores the history of Japanese fiscal policy over the past two decades with the aim of better understanding where previous forecasts have erred
- Japan provides an important case study of how a country facing intense fiscal pressures can avoid a hyperinflation or financial panic
- Replicates Broda and Weinstein (2005) and finds that there were three key forces that improved Japan's fiscal situation relative to more pessimistic predictions
  - First, the Japanese government has shown remarkable ability to hold down *per capita* expenditures on social pensions and healthcare
  - Second, the Japanese government has shown remarkable ability to raise taxes substantially
  - Third, the remarkable monetary policy pursued by the Bank of Japan has resulted in a dramatic decline in the amount of government bonds held by the private sector.

# What Do We Mean by Fiscal Sustainability?

- Trend Extrapolation
  - Can current debt trends continue?
- Generational Accounting
  - Will future generations pay disproportionately for their future benefits relative current generations?
- Blanchard-style Fiscal Forecasting
  - Can current the government stabilize debt growth by maintaining current policies?
- Crucially all approaches rely on models of future behavior
  - How well did our models perform over the the past two decades?

# Agreeing to Disagree

- Places of Agreement
  - Current trends of debt growth cannot continue
  - Current and future generations of Japanese will pay more for their benefits relative to past generations
  - In this sense, Japan's fiscal policy is not sustainable
- Places of Disagreement
  - Japan can stabilize the debt and avoid a crisis if Japan continues current policies



# Blanchard Approach

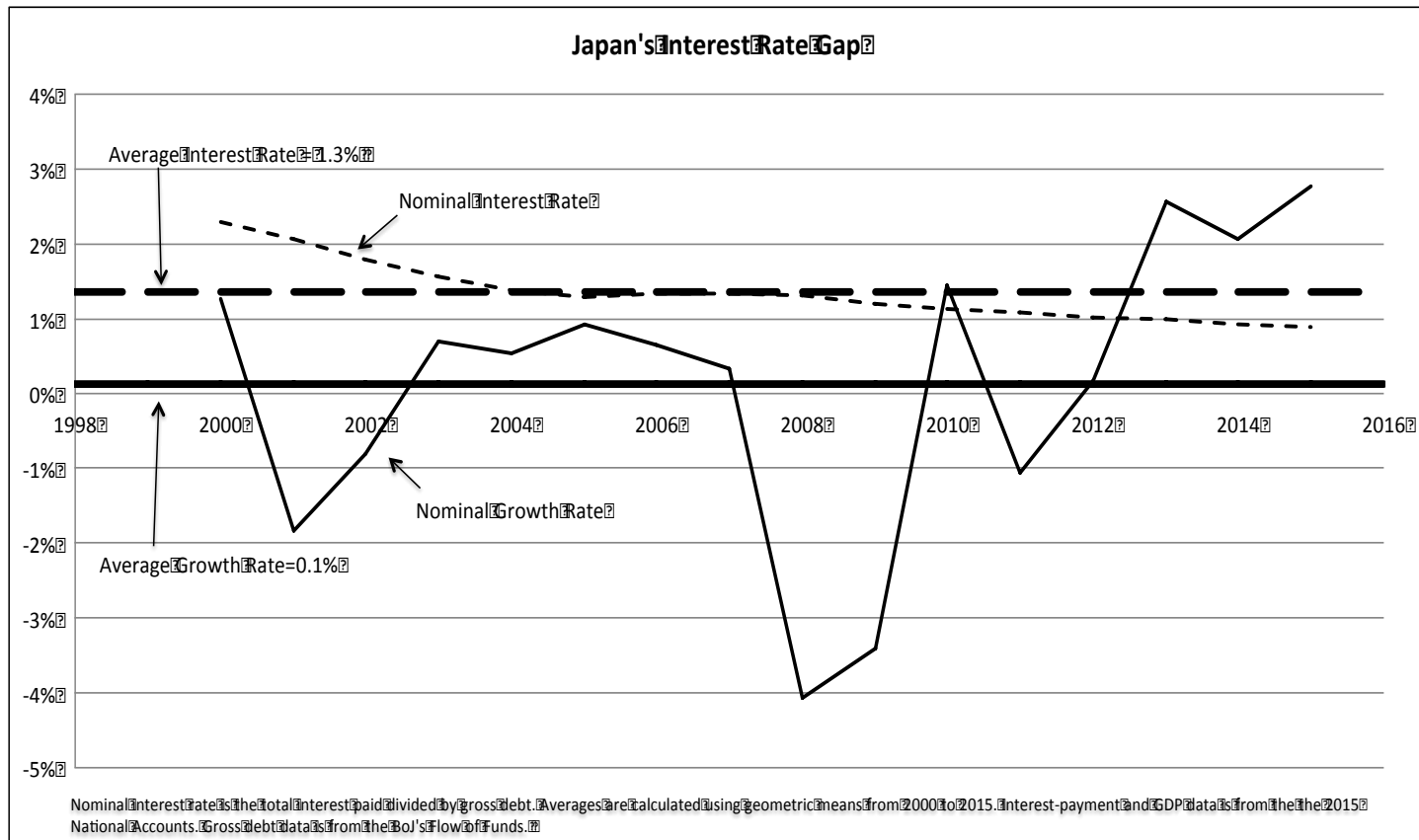
- The government's intertemporal budget constraint can then be written as:
- If we divide both sides of equation (1) by nominal GDP and rearrange terms, we obtain

$$b_t = g_t + h_t - t_t + \frac{1+i_t}{1+h_t} b_{t-1} - \frac{l_t}{1+l_t} m_t$$

- We can express the level of debt-to-GDP in period  $n$  as:

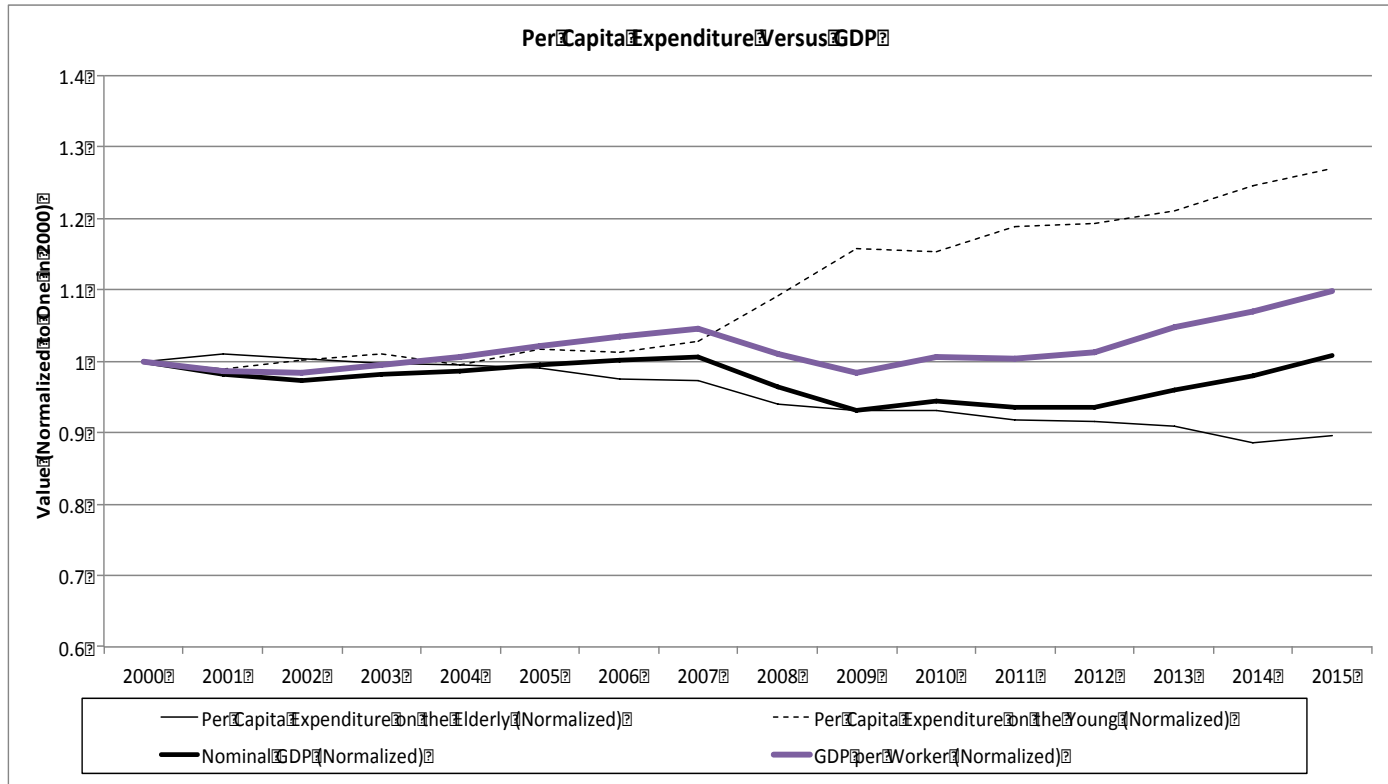
$$b_n = \sum_{t=1}^n \left( \frac{1+i_t}{1+h_t} \right)^{n-t} \left( g_t + h_t - t_t - \frac{l_t}{1+l_t} m_t \right) + \left( \frac{1+i_t}{1+h_t} \right)^n b_0$$

# Evolution of $i_t - \eta_t$



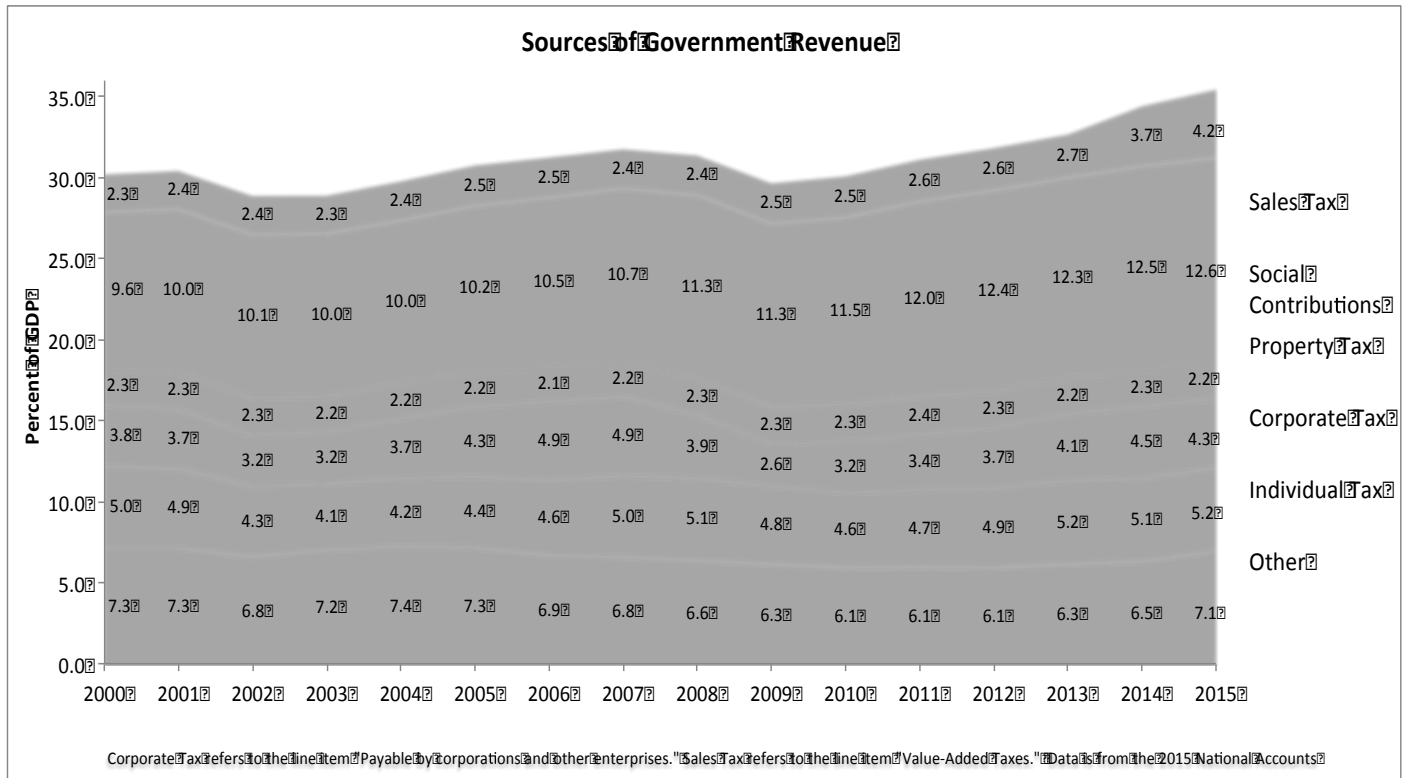
- Average interest rate gap was only 1.2%, below the common 2% assumption
- This low interest rate gap meant that it was easier for the Japanese government to finance the debt

# Evolution of $g_t$ and $h_t$



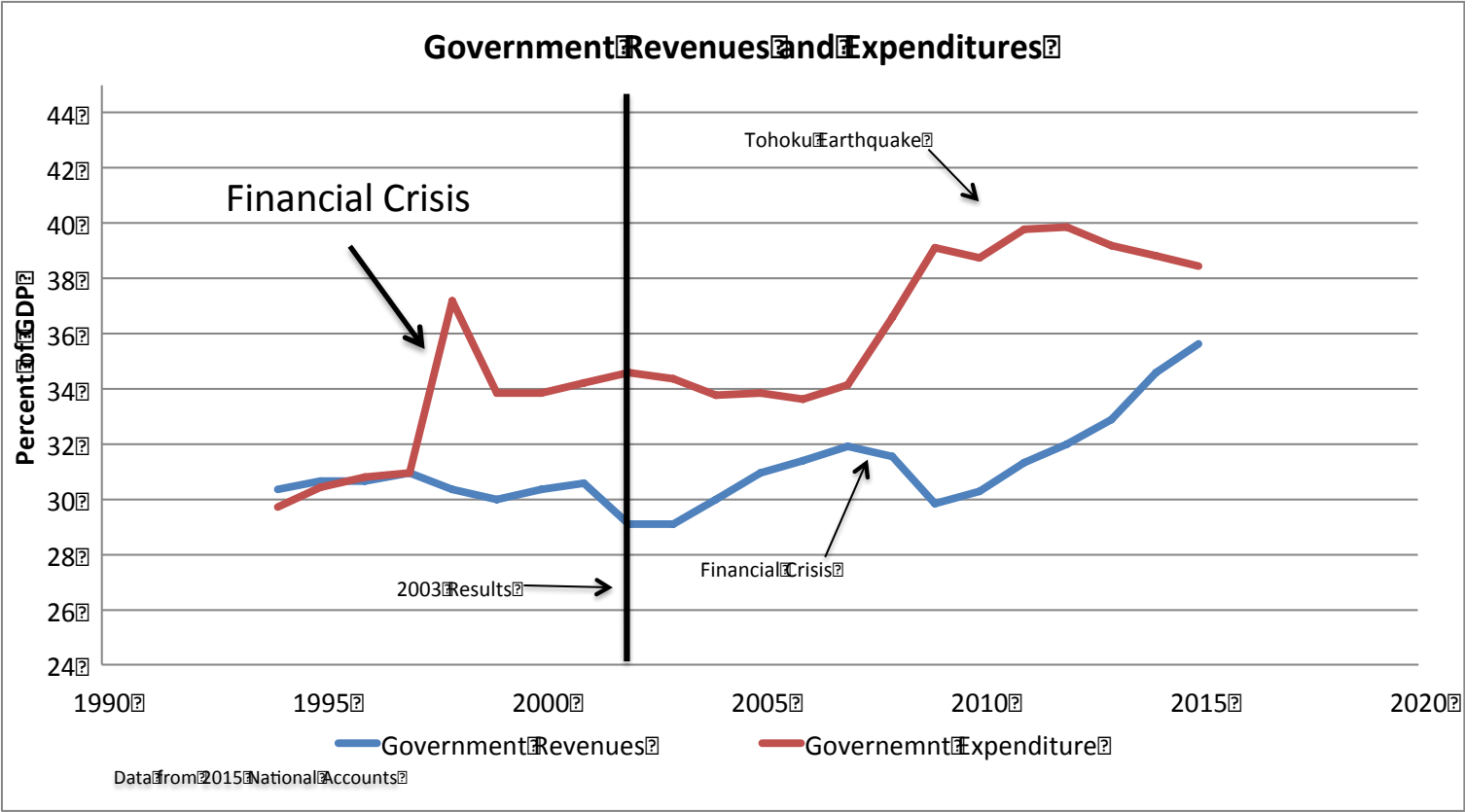
- Rise in per capita expenditures on elderly ( $h_t$ ) was lower than rise in GDP per worker, GDP, and even wages due to 2004 pension reforms
  - Much more fiscal discipline than in **all** fiscal forecast models!
  - Japan held down expenditure growth where it mattered ( $h_t$ )
- Fiscal response to Lehman crisis and earthquake led to a rise in ( $g_t$ ) above forecast

# Evolution of $\tau_t$

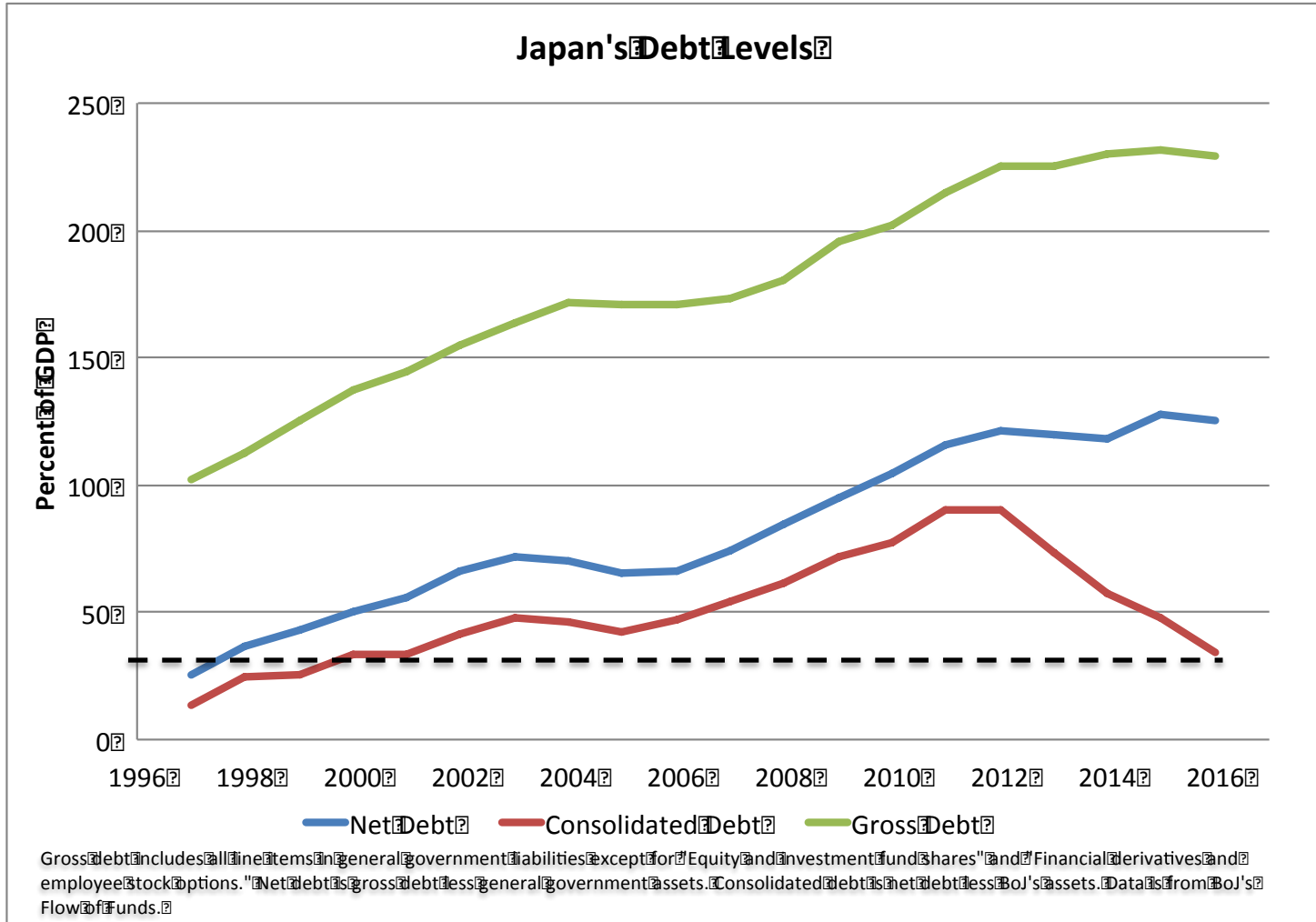


- 2004 Social Security reform raised social contributions by 2 percent of GDP
- 2014 3% consumption tax increase raised sales taxes by 1.5% of GDP

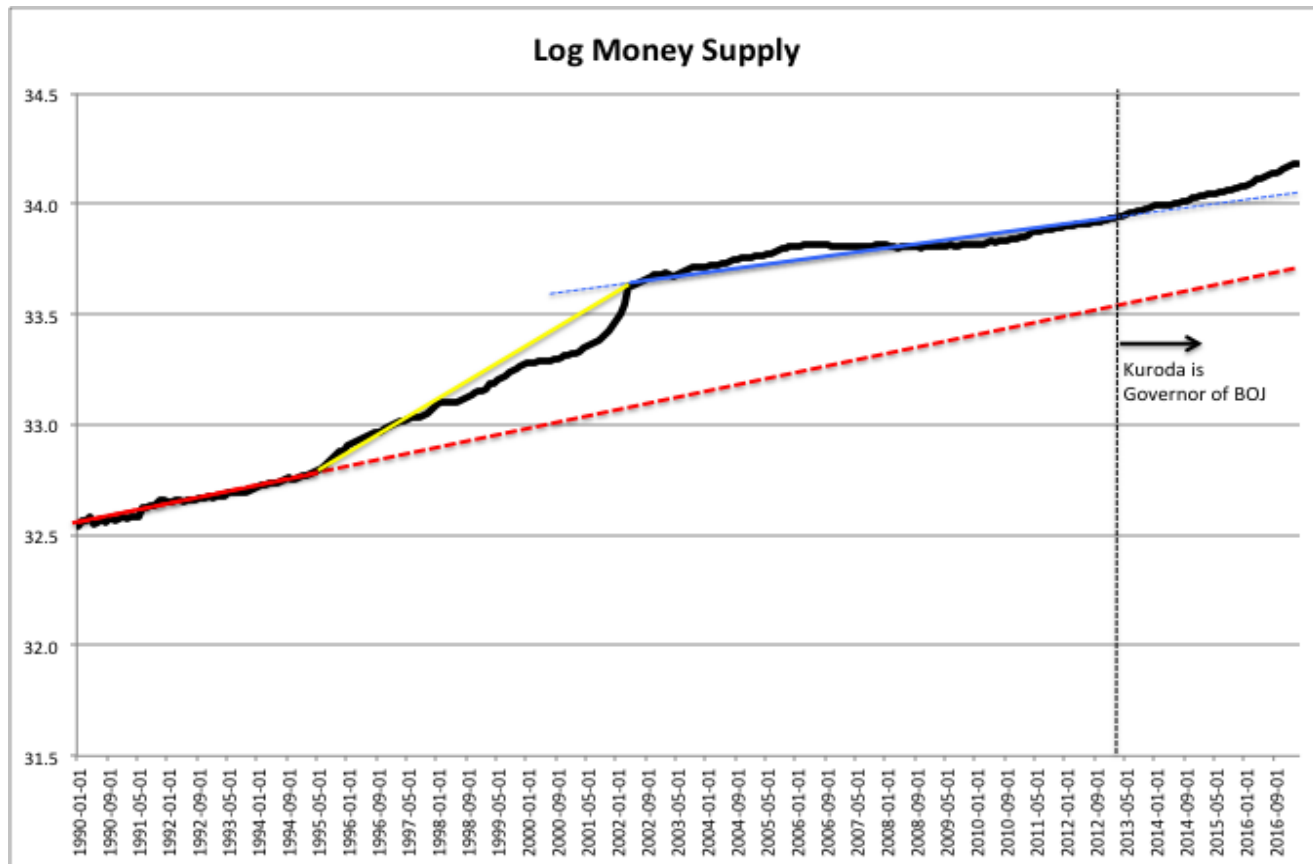
# Impact of Austerity on Budget Deficit



# How Debt is Measured Matters



# Japan's Long-Run Money Growth



- Japan has 50% more money in its economy than would have been predicted by extrapolating money growth in the early 1990s
- Same level as what Japan would have had if it paid attention to the initial price level targeting papers

# Broda-Weinstein Redux: Sustainable Tax Rates

Forecasts	Sustainable Tax Rates					
	Case 1		Case 2		Case 3	
	2016	2003	2016	2003	2016	2003
Rate Gap						
0	33.5	33.6	25.8	27.0	45.1	42.5
1	34.5	34.5	27.8	28.9	44.6	42.1
2	35.4	35.3	29.6	30.7	44.1	41.5
3	36.2	36.0	31.3	32.1	43.7	41.1
4	36.9	36.6	32.7	33.4	43.4	40.7
2003 Tax Rate	29.1					
Current Tax Rate	35.6					

Entries are percentages of GDP.

In Case 1, *per capita* expenditures on the elderly are proportional to GDP, while expenditures on the young are proportional to GDP.

In Case 2, *per capita* expenditures (both on the young and on the elderly) are proportional to GDP.

In Case 3, *per capita* expenditures (both on the young and the elderly) are proportional to GDP per worker.

Both 2003 and 2016 results use population forecasts from NIPSSR.

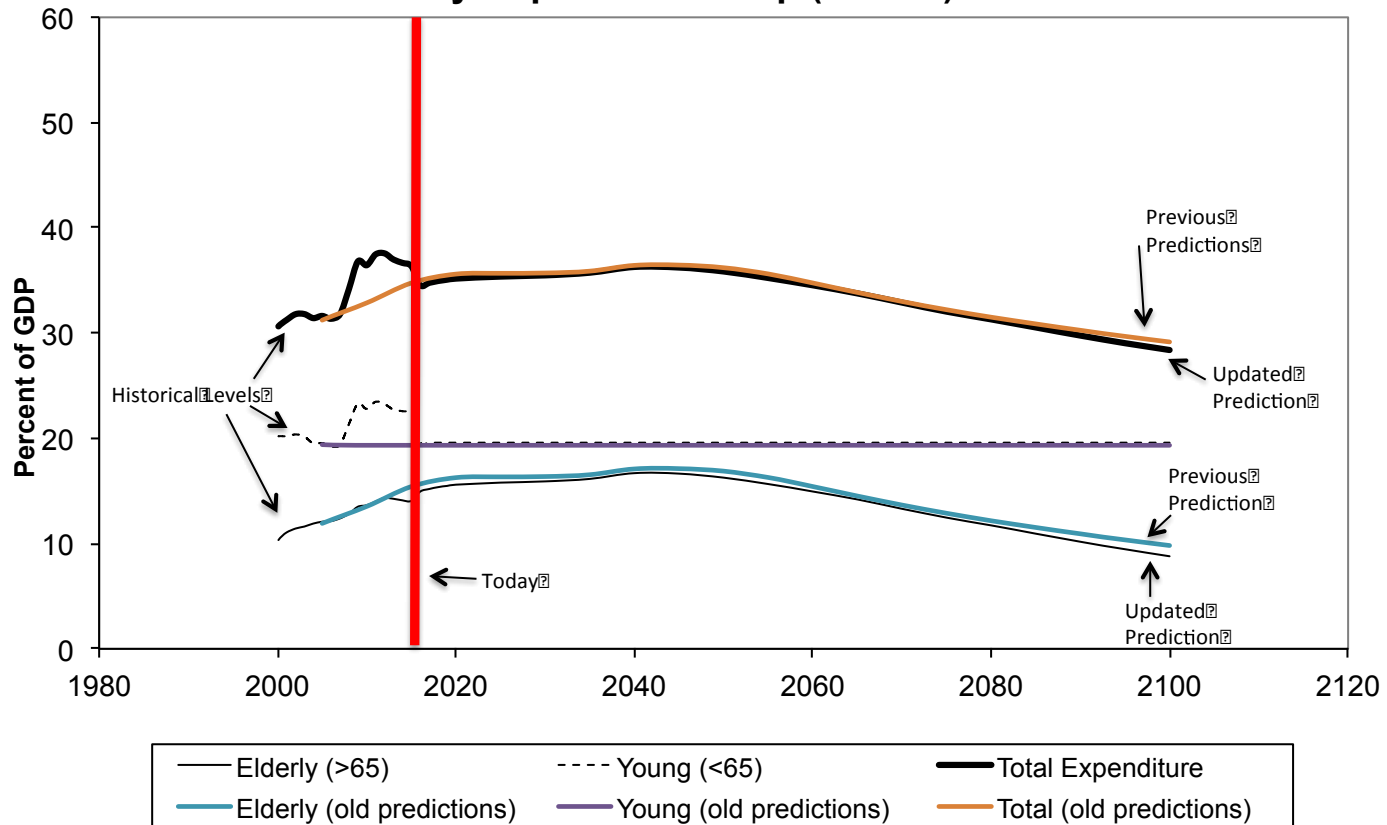
"Updated 2003" is the sustainable tax rate in 2003 calculated using the realized expenditures through 2015 and the updated forecasts thereafter.

- Japanese tax rates are at sustainable unless future *per capita* benefit levels exceed past trends



# BW Middle Case

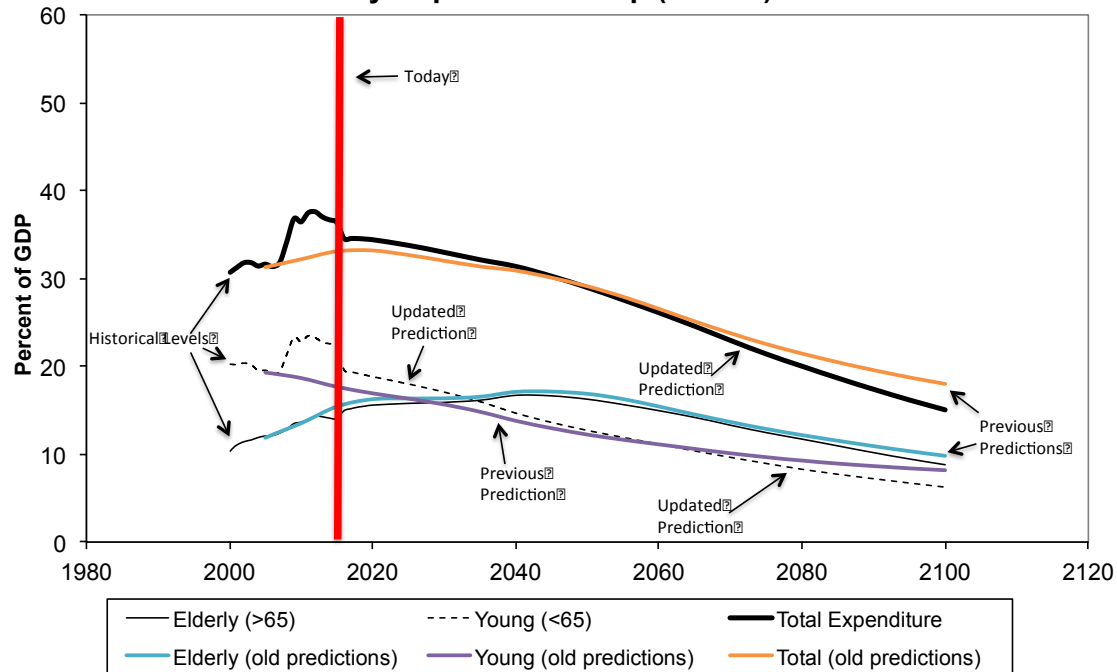
Japan 2020-2100: Government Expenses as a Share of GDP by Population Group (Case 1)



- BW didn't anticipate Lehman crisis and Tohoku earthquake so underestimated expenditures on young
- BW overestimated expenditures on elderly

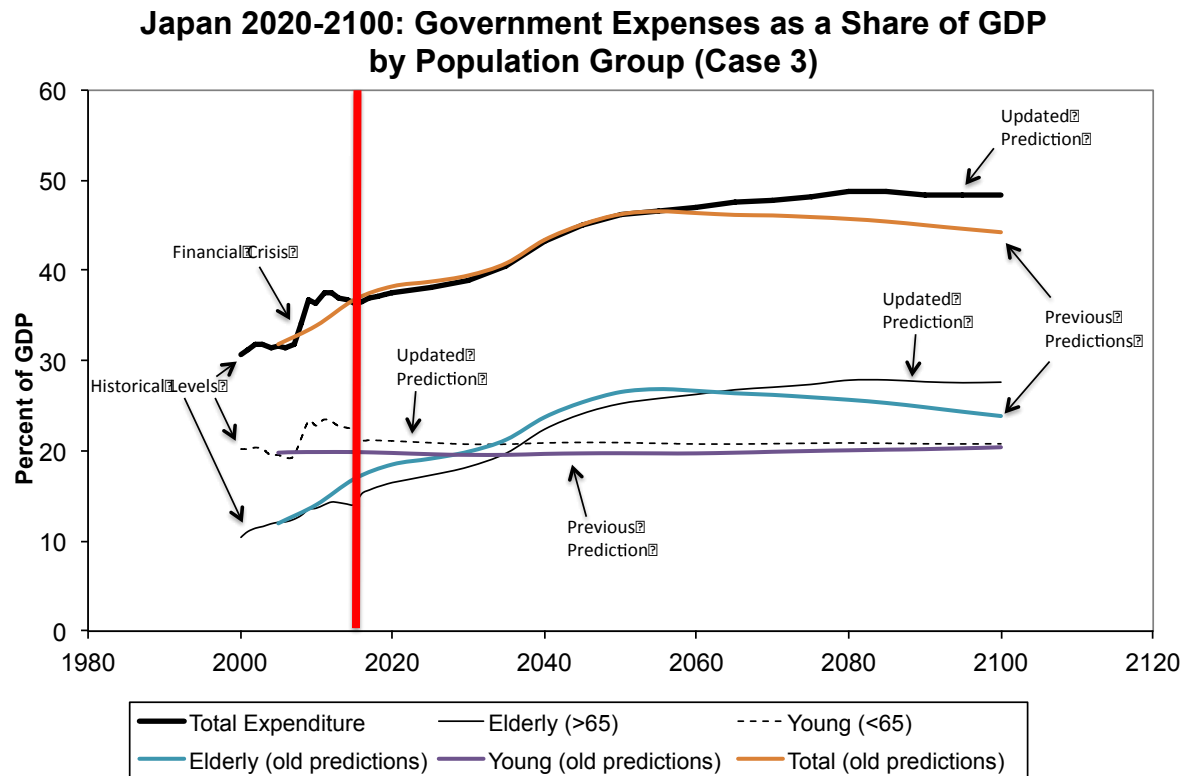
# BW Fiscal Discipline Case

Japan 2020-2100: Government Expenses as a Share of GDP by Population Group (Case 2)



- Underestimates discipline on elderly overestimates

# BW Generous Benefit Case



- Assumption of elderly benefit growth most similar to most models
- Greatly overstates past benefit growth for elderly

# Conclusion

- There were three key forces that improved Japan's fiscal situation relative to more pessimistic predictions
  - First, the Japanese government has shown remarkable ability to hold down *per capita* expenditures on social pensions and healthcare
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