

“Stock Price Targeting” and Fiscal Deficit in Japan:
Why was Japan’s Fiscal Deficit Accelerated in the Lost Decades?*

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Abstract

The purpose of this paper is to explore why Japan increased its fiscal deficit so dramatically in the 1990s and in the 2000s. In the analysis, we focus on the role of “stock price targeting” to explain why the amount of fiscal expenditure increased so steadily in the 1990s. After presenting a simple model to describe the government behavior, the paper tests whether the model can explain the Japan’s fiscal expenditure. The empirical results show that “stock price targeting” can explain the Japan’s fiscal expenditure reasonably well in the 1990s. Less effective stimulus policy accelerated the huge fiscal deficit. However, the results also show that deteriorated macro fundamentals explain the increased fiscal deficit in the late 2000s.

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1. Introduction

After the global financial crisis, accumulated fiscal deficit became one of the urgent issues to be solved in most OECD countries. According to OECD Economic Outlook 87, the OECD average ratio of general government gross financial liabilities to nominal GDP, which was 73% in 2007, is projected to be 99.8% in 2011. The average ratio is largest in the past half century. However, comparing fiscal deficit across countries, Japan accumulated exceptionally higher deficit than any other OECD countries. Measured by general government gross financial liabilities, Japan's fiscal liabilities became twice as much as nominal GDP in 2010. The ratio suggests that Japan's fiscal deficit is much more serious than any PIGS countries (Portugal, Ireland, Greece, and Spain) that had fiscal crisis after the global financial crisis. Even excluding assets from liabilities, Japan's general government financial liabilities are estimated to exceed nominal GDP after 2009¹. After 2008, the net ratio in Japan is estimated to be largest among the OECD countries.

Until the mid-1970s, Japan had been one of the exceptional countries that had little fiscal imbalance. The ratio of Japanese government bond outstanding to GDP was 3.7% in 1970 and 9.9% in 1975. Even in the early 1990s, Japan's gross government liabilities were close to the OECD average and its net liabilities were far below the average. However, from 1992 to 2000, the gross liabilities doubled and the net liabilities quadrupled in Japan (see **Figures 1**). The upward trend was accelerated after the global financial crisis broke out. Japan's fiscal deficit became exceptionally high in the 1990s and was accelerated in the late 2000s.

The purpose of this paper is to explore why Japan increased its fiscal deficit so dramatically in the 1990s and in the 2000s. One of the straightforward answers to the question is that Japan had prolonged stagnation in the period. However, although the period is sometimes called "lost two decades", average growth rates in Japan were not exceptionally low in the OECD countries in the

¹ Broda and Weinstein (2005) point out that net debt levels are more appropriate to assess the fiscal sustainability than gross debt. However, their estimation seems to overvalue the government's net asset, especially the assets of social security accounts.

two decades. **Table 1** summarizes average annual growth rates of selected OECD countries in the 1990s and in the 2000s. Japan's growth rates were lower than the OECD average. But they were slightly lower than France's, almost equal to Switzerland's, and were slightly higher than Italy's. Given the fact that fiscal deficit did not expand in these countries, the slow economic growth in Japan will not be enough to explain dramatic increases of fiscal deficit in the 1990s and in the 2000s.

In contrast, comparing stock price indexes in major OECD countries, we can see unique feature that Japan had. Japan had stock market "bubble" in the late 1980s. Nikkei Average, which was less than 10,000 yen in December 1984, rose to 30,000 yen in December 1988 and became close to 40,000 yen in December 1989. The overvalued stock prices, however, did not persist. After the crash of the speculative bubble in January 1990, Nikkei Average fell below 20,000yen in early 1992 and experienced further declines from 1998 to 2003 when Japan had serious banking crisis. Such dramatic declines in stock prices were never observed in the other developed countries in the 1990s and the 2000s before the global financial crisis.

When the stock price is overvalued substantially, its dramatic decline is inevitable. No government policy can stop the subsequent decline until the price is adjusted to its fundamental value. The dramatic price decline, however, causes a serious problem from a political point of view. Medium voters do not have enough knowledge about what is the fundamental value and what is speculative bubble. The politicians therefore face persistent pressures from the public to implement government policies to stop the continual asset price declines. In the 1990s, Japan was under such environment. This called for excessive expansion of fiscal expenditures under declining tax revenues.

The Japanese government announced series of fiscal stimulus packages in the 1990s. The packages were originally motivated by the traditional Keynesian view. However, since the targeted stock price was overvalued, the fiscal stimulus could never achieve the target. The packages, therefore, increased fiscal expenditure throughout the 1990s and resulted in huge fiscal

deficit at the end of 1990s. In the following analysis, we focus on the role of “stock price targeting” to explain why the amount of fiscal expenditure increased so steadily in the 1990s. After presenting a simple model to describe the government behavior, the paper tests whether the model can explain the Japan’s fiscal expenditure by using daily data in the 1990s. The empirical results show that the model can explain the Japan’s fiscal expenditure reasonably well. Less effective stimulus policy accelerated the huge fiscal deficit. However, the results also show that deteriorated macro fundamentals explain the increased fiscal deficit in the late 2000s.

One of the common problems to test the determinants of fiscal expenditure is how to identify when the amount of fiscal expenditure was determined in each fiscal stimulus package. In Japan, supplementary budget is determined as extra budget to stimulate the economy.² It is announced either in spring, in fall, or in both. However, it usually takes a month for the government to make the final decision of the package after starting its planning. During the planning period, the government frequently changes the amount substantially. We collected the information of the announcements during such planning periods based on articles in several news papers. The collected data has a desirable property because each announcement is an unanticipated shock to the economy. We will then examine whether our model of stock price targeting can track a series of the announcements in the 1990s and the 2000s.

In previous literature, several studies explored fiscal deficit in Japan. Asako, Ito, and Sakamoto (1991) investigated the rise and fall of deficit from 1965 to 1990. Fukuda and Teruyama (1994) tested the sustainability of deficits during the same period. Ihori, Doi, and Kondo (2001) and Ihori, Nakazato, and Kawade (2002) discussed Japan’s fiscal policies in the 1990s. Doi and Ihori (2002) provided empirical evidence that lobbying activities of local interest groups exacerbated the deficit in the 1990s. However, few previous studies focused on the role of “stock price targeting” to explain why the amount of fiscal expenditure increased so steadily in the 1990s.

² In Japan, initial budget of general account expenditure is determined in due course every year. The initial budget is usually determined based on the latest initial budget to cover regular government expenditure.

2. Fiscal Stimulus Packages in the 1990s

In this section, we overview a series of the fiscal stimulus packages implemented in the 1990s and the early 2000s. From 1992 to 2002, the Japanese government announced fiscal stimulus packages every year except in 1996.³ They were announced either in spring (that is, from March to May), in fall (that is, from August to December), or in both. Based on the information provided by the Cabinet Office the Japanese Government, **Table 2** reports the names of each fiscal stimulus package (i.e., the economic countermeasure), the date of its final announcement, and its total amount of expenditure. The total amount of the fiscal expenditure was not specified in some the fiscal packages. But when specified, one of the salient features in the table is that the amount of fiscal expenditure in the packages increased steadily throughout the 1990s. This may suggest that Japan's fiscal spending was gradually raised due to political pressures of interest groups in the 1990s.

However, the increased amount was larger than what the government originally planned in each package. In Japan, it usually took a month for the government to make the final decision of the fiscal package after starting its planning. During the planning period, cabinet members and other politicians frequently conveyed their outlook for the total amount either formally or informally. When we look over the conveyed amounts, we can see that the amounts tended to increase substantially in a few days. As a result, in most cases, the amounts finally announced became much larger than those originally planned. Japan's fiscal spending was raised in the short planning periods.

Table 3 summarizes the date of its announcement and its total amount of fiscal expenditure for several fiscal stimulus packages in the 1990s. The information was collected based on Nikkei

³ In 1997, the Japanese government tried to implement the Fiscal Structural Reform so as to reduce budget deficit. However, in 1998, it stopped the reform and reduced taxes and increased public investment.

News Paper, Asahi News Paper, and Yomiuri News Paper. In most cases, the amount initially announced was not so different from the final amount of the latest package. However, the amount increased as a new announcement was made. Consequently, the amount finally announced became much larger than those originally planned. The result suggests that a political process to determine the stimulus packages might have been responsible for the steadily increased fiscal expenditure in the 1990s.

3. Why Did the Amount of Fiscal Expenditure Increase in the 1990s?

In the last section, we overviewed the fiscal stimulus packages in the 1990s and the early 2000s and showed that the total amount of the packages increased steadily throughout the 1990s. The purpose of this section is to investigate why the amount increased so steadily. Specifically, we explore a possibility that an implicit “stock price targeting” may explain the steady increases in the fiscal expenditure. To the extent that the targeted stock prices reflect the fundamental values, the target may not cause any problem. But if the targeted prices exceed the fundamental values, the government needs extra fiscal expenditure to achieve the target. This is particularly true when the public expects that the government provides at least the same amount as it did last year.

Consider a simple present discounted value model. In the model, the stock price in period t equals to the present discounted value of the current and future expected output. The output in period t is linearly dependent not only on exogenous output but also on the amount of fiscal expenditure in period t . We then have the following simple equations:

$$(1) S_t = \sum_{i=0}^{\infty} \beta^i E_t Y_{t+i} ,$$

$$(2) Y_t = y_t^* + \alpha G_t,$$

where S_t = stock price, Y_t = output, y_t^* = exogenous output, G_t = fiscal expenditure, and β = discount factor such that $0 < \beta < 1$. Subscript t denotes time period. E_t is conditional expectation operator based on the information available in period t .

For simplicity, we assume that both y_t^* and G_t are determined by the sum of deterministic time trend, deterministic seasonal cycle, and random shocks. We also assume that the random shocks are independent and identically distributed over time. To the extent that the time span is very short between period $t-1$ and period t , it approximately holds that $E_{t-1} S_t = S_{t-1}$. We then obtain that

$$(3) \quad S_t = S_{t-1} + \{1/(1-\beta)\} \{(y_t^* - E_{t-1}y_t^*) + (G_t - E_{t-1}G_t)\}.$$

Equation (3) indicates that the change of the stock price depends on unanticipated changes in exogenous output and government expenditure. Under the stock price targeting, the government chooses G_t so as to minimize the loss function

$$(4) \quad L_t \equiv (S_t - S_t^*)^2,$$

where S_t^* is the targeted value of stock prices in period t . We assume that $E_{t-1}G_t = G_{t-T}$ where $t-T$ is the latest time that the government announced the amount of fiscal expenditure before time t . The assumption implies that the public forms static expectations on the fiscal expenditure. The loss minimization under equation (3) then leads to

$$(5) \quad G_t - G_{t-T} = \text{constant} + \gamma \text{ seasonal dummy} - \delta (S_{t-1} - S_t^*).$$

To the extent that the coefficient of S_{t-1} is significantly negative, equation (5) indicates that the government increases the fiscal expenditure when the stock price declines. Since the stock prices

declined more substantially than the output in the 1990s, the stock price targeting results in incredibly large fiscal deficit in Japan.

4. Empirical Estimation

In the last section, we discussed the importance of the stock price targeting to determine the amount of fiscal expenditure and derived equation (5) that describes the government behavior. In this section, we will test how well equation (5) can describe the Japanese government's behavior in the 1990s. As for the data, we use the announced amounts of fiscal expenditure for G_t and the stock prices on the day before the announcement for S_{t-1} . The announced amounts are those summarized in Table 3. The latest announced amount is used for G_{t-T} . The stock price is Nikkei 225 average at closing time (3pm) on the day before the announcement. For the targeted stock price S_t^* , we consider two alternative cases. One is the case where S_t^* is constant over time and the other is the case where S_t^* equals to S_{t-2} . We include S_{t-1} as an explanatory variable in the former case and $S_{t-1} - S_{t-2}$ in the latter case.

The sample period is from 1992 to 2000. We do not include the fiscal stimulus packages in 2001 and 2002 because the government did not announce the exact amount explicitly for these packages. Around 2001, the Japanese government realized that its accumulated fiscal deficit became very critical and that the additional fiscal expenditures were not beneficial enough to sacrifice the costs caused by the fiscal deficit.

In the regressions, we include the change of industrial production index in the last month as an additional explanatory variable. If the government targets a co-incident indicator of business cycle, this additional variable would be significantly negative in the regressions. To capture the effects of seasonal cycles, we include a "fall" dummy that takes one when the packages are in fall and zero otherwise. We also include an "initial" dummy that takes one when it was initial announcement for each package and zero otherwise.

Table 4 summarizes the regression results. Reflecting the upward time trend of fiscal expenditure, the constant term was significantly positive in both cases. The initial dummies were significantly negative in all cases, suggesting that the initial announcement in each package was moderate. More importantly, the stock price index was significantly negative, although the significance level was 10% when we use the level of S_{t-1} as an explanatory variable. In contrast, the change of industrial production index was not significant. The results support our hypothesis that the government targeted the stock price index rather than a co-incident indicator of business cycle when deciding the amount of expenditure in each fiscal package.

5. Fiscal Stimulus Packages in the 2008 and 2009

The Japanese government implemented no fiscal package from 2003 to 2007⁴. This was partly because the Japanese economy was under recovery during the period. But Japan's average growth rates were still one of the lowest among the OECD countries in the 2000s. In contrast, the stock prices, which hit the bottom in April 2003, showed substantial recovery from summer in 2003 to summer in 2007.⁵ Given extremely large accumulated fiscal deficit, this might have discouraged the Japanese government to make further acceleration of fiscal deficit.

However, after the outbreak of the global financial crisis, the Japanese experienced unprecedented declines of real GDP for the past half century. The stock prices also declined persistently after fall in 2007 and the Lehman shock in September 2008 accelerated the declines. Correspondingly, the Japanese government implemented new fiscal stimulus packages in fall 2008, in spring 2009, and in fall 2009. This follows an agreement in G20 meeting that called for

⁴ Under the Koizumi Administration, the "Structural Reform of the Japanese Economy: Basic Policies for Macroeconomic Development" was decided upon after acceptance of the report compiled by the Council on Economic and Fiscal Policy, an advisory council to the prime minister.

⁵ For example, Nikkei 225 Average which fell below 8000 yen in April 2003 rebounded to 14,000 yen in April 2004. It rose up to 18,000 yen in February 2007 and remained high until July 2007.

coordinated fiscal expansion in member countries. The purpose of this section is to explore whether the stock price targeting was still relevant in deciding the total amount of expenditure.

Table 5 summarizes the date of its announcement and its total amount of fiscal expenditure for five fiscal stimulus packages in 2008 and 2009. The information was collected based on Nikkei News Paper. Except for the last package, each package had larger amount of fiscal expenditure than the latest one. However, unlike the fiscal stimulus packages in the 1990s and the early 2000s, the packages were planned and finalized in relatively short periods. More interestingly, except for the last package, the amount finally announced was not so different from the amount initially announced.

As in section 4, we estimate equation (5) based on the announced data in Table 5. This tests whether equation (5) still describes the Japanese government's behavior in the late 2000s. The explanatory variables are essentially the same as those in section 4. However, because of data availability, we use the announced amounts of national government expenditure for G_t .

Table 6 summarizes the regression results. The constant term was positive but insignificant, suggesting ambiguous upward time trend of fiscal expenditure in 2008 and 2009. The initial dummies were significantly negative in all cases, suggesting that the initial announcement in each package was moderate. More interestingly, the results show that the stock price index was not significantly negative in the 2000s. It was positive but insignificant when we use the level S_{t-1} and negative but insignificant when we use the difference $S_{t-1} - S_{t-2}$ as the explanatory variable. In contrast, the change of industrial production index was negative. In particular, it was significant when we use the difference $S_{t-1} - S_{t-2}$ as the explanatory variable. The results support the view that the government targeted aggregate production rather than the stock price index when deciding the amount of expenditure in each fiscal package in the late 2000s.

In terms of size of fiscal deficit, the fiscal expansions in the late 2000s were larger than those in the 1990s and in the early 2000s. The accumulated government liabilities which were temporarily stabilized from 2006 to 2007 increased dramatically in 2009 and in 2010. But our

empirical results suggest that unlike in the 1990s, macro fundamentals rather than stock prices were responsible for the dramatic fiscal expansions in the late 2000s. The fiscal expansions in 2008 and in 2009 were inevitable under unprecedented macroeconomic deterioration caused by the global financial crisis.

6. The Effects of the Fiscal Stimulus on the Stock Prices

Until the last section, we have imposed an implicit assumption that the fiscal stimulus is effective in increasing the output. Although the assumption follows a classical Keynesian view, it is unlikely that the fiscal stimulus was similarly effective throughout the 1990s and the 2000s. The purpose of this section is to examine how the effectiveness of the fiscal stimulus changed throughout the 1990s and the 2000s.

Recall equation (3) in section 3. Assuming that $E_{t-1} S_t = S_{t-1}$, this equation is rewritten as

$$(6) \quad \Delta S_t = \text{constant} + \eta \text{Dummy}_t + u_t,$$

where $\eta \text{Dummy}_t \equiv \{1/(1-\beta)\}(E_t G_t - E_{t-1} G_t)$ and $u_t \equiv \{1/(1-\beta)\}\{(E_t y_t^* - E_{t-1} y_t^*)\}$. In equation (6), Dummy_t is the dummy variable to capture the effectiveness of the fiscal expenditure.

In the following analysis, we suppose that the dummy variable takes one when the announcement was made and zero otherwise. To the extent that the coefficient of the dummy is significantly positive, we may conclude that the fiscal stimulus was effective. We used intra daily data of Nikkei 225 Average (at 11am Tokyo Time and at 3pm Tokyo Time) for the stock prices. We estimate equation (6) separately for twelve fiscal stimulus packages.

Table 7 summarizes the estimation results. Multiple dummy variables were significantly positive for the stimulus packages in fall 1992, in spring 1993, and in spring 1998. This indicates that the stimulus packages were effective when the government did not have the stimulus package

for previous few years. However, no dummy variable was significantly positive in fall 1993, in fall 1995, and in fall 1998. In spring 1994 and in fall 1999, one dummy variable took significantly positive sign but the other took significantly negative sign. This indicates that the stimulus packages became less effective when the government implemented the stimulus package for previous years. Under the stock price targeting, the amount of fiscal expenditure increases as the stock price remains low. Less effective fiscal stimulus might have accelerated the amount of fiscal expenditure in the mid and late 1990s.

In the late 2000s, the fiscal announcement dummy was significantly positive in both spring and fall in 2009. But most of the announcement dummies took negative sign, although they were not significant. The results imply that the large scale fiscal expansions were somewhat effective but their role was limited in stimulating substantial stagnation in the stock markets during the period.

7. Concluding Remarks

In this paper, we explored why Japan increased its fiscal deficit so dramatically in the 1990s and in the 2000s. We investigated the role of “stock price targeting” to explain a series of stimulus fiscal packages in Japan. After presenting a simple model to describe the government behavior, the paper found that the model can explain the Japan’s fiscal expenditure in the 1990s. The empirical results showed that the model can explain the Japan’s fiscal expenditure reasonably well. Less effective stimulus policy accelerated the huge fiscal deficit. However, the results also showed that deteriorated macro fundamentals explain the increased fiscal deficit in the late 2000s.

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Table 1. Average Annual Growth Rates in Selected OECD Countries

Unit: %

	OECD avg.	USA	Japan	France	Italy	Switzerland
1990-2000	2.56	3.19	1.49	1.85	1.41	1.09
2000-2007	2.60	2.60	1.72	2.12	1.47	2.18
1990-2007	2.57	2.92	1.59	1.97	1.44	1.57

Source) OECD, National Account Statistics.

Table 2. Fiscal Stimulus Packages in the 1990s and in the 2000s

Name of Economic Countermeasures	Date	prime minister	total amount	excluding tax cut
Emergency Economic Measures	1992/3/31	K. Miyazawa		
Comprehensive Economic Stimulus Measures	1992/8/28	K. Miyazawa	10,700 billion yen	
Comprehensive Economic Measures	1993/4/13	K. Miyazawa	13,200 billion yen	
Emergency Economic Measures	1993/9/16	M. Hosokawa	6,150 billion yen	
Comprehensive Package of Economic Measures	1994/2/8	M. Hosokawa	15,250 billion yen	9,780 billion yen
Emergency Economic Countermeasures to cope with the Yen Appreciation	1995/4/14	T. Murayama	-	
Economic Measures	1995/9/20	T. Murayama	14,220 billion yen	
Emergent Economic Policy Package Reforming Japan for the 21st Century	1997/11/18	R. Hashimoto		
Comprehensive Economic Measures	1998/4/24	R. Hashimoto	16,650 billion yen	12,650 billion yen
Emergency Economic Package	1998/11/16	K. Obuchi	23,900 billion yen	17,900 billion yen
Measures for the rebirth of the Japanese economy	1999/11/11	K. Obuchi	about 18 trillion yen	
Policy Package for New Econ. Develop. Measures for the Rebirth of Japan	2000/10/19	Y. Mori	about 11 trillion yen	
Emergency Economic Package	2001/4/6	Y. Mori		
Front-Loaded Reform Program	2001/10/26	J. Koizumi	about 5.8 trillion yen	
Immediate Economic Action Package	2001/12/14	J. Koizumi	about 4.1 trillion yen	
Comprehensive Measures to Accelerate Reforms	2002/10/30	J. Koizumi		
Program to Accelerate Reforms	2002/12/12	J. Koizumi	about 4.4 trillion yen	
Comprehensive Immediate Policy Package -Easing Public Anxiety-	2008/8/29	Y. Fukuda	about 11.7 trillion yen	
Measures to Counter Difficulties in People's Daily Lives	2008/10/30	T. Aso	about 26.9 trillion yen	
Immediate Policy Package to Safeguard People's Daily Lives	2008/12/19	T. Aso	about 43 trillion yen	
Countermeasures to Address the Economic Crisis	2009/4/10	T. Aso	about 56.8 trillion yen	
Emergency Economic Countermeasures for Future Growth and Security	2009/12/8	Y. Hatoyama	about 24.4 trillion yen	

Source) Cabinet Office, Japanese Government.

Table 3. The Changes of Announced Amount for Each Stimulus Package

92.8.28 Morning: Comprehensive Economic Stimulus Measures

	Total amount	Source of the announcement
92.8.7	6 - 7 trillion	LDP Policy Research Council
92.8.21	7 - 8 trillion	gov. skeleton
92.8.25	8 trillion and over	LDP plan
92.8.26	9 trillion and over	gov. draft
92.8.28	10.7 trillion	LDP final decision

93.4.13 Morning: Comprehensive Economic Measures

	Total amount	Source of the announcement
93.3.16	10.7 trillion and over	LDP 4 executive members
93.4.2	about 12 trillion	gov. outlook
93.4.13	13.2 trillion	gov. final decision

93.9.16 Evening: Emergency Economic Measures

	Total amount	Source of the announcement
93.9.10	5 trillion and over	gov. skeleton
93.9.16	6.15 trillion	gov. final decision

94.2.8 Afternoon: Comprehensive Package of Economic Measures

	Total amount including tax cut	Total amount excluding tax cut	the amount of tax cut	Source of the announcement
94.1.7	7 trillion and over	7 trillion and over	0	gov. party skeleton
94.1.25	13.2 trillion	less than 9 trillion	6-7 trillion	gov. skeleton
94.1.28	15 trillion and over	9 trillion	6-7 trillion	gov. outlook
94.2.3	15.1 trillion	8.8 trillion	5.3 trillion	gov. outlook
94.2.8	15.25 trillion	9.78 trillion	5.47 trillion	gov. final decision

95.9.20 Noon: Economic Measures

	Total amount	Source of the announcement
95.9.13	10 trillion and over	gov. skeleton
95.9.18	11 - 12 trillion	gov. and coalition parties outlook
95.9.20	14.22 trillion	gov. final decision

Table 3. The Changes of Announced Amount for Each Stimulus Package (continued)

98.4.24 Evening: Comprehensive Economic Measures

	Total amount including tax cut	Total amount excluding tax cut	special tax cut	Source of the announcement
98.3.25	12 trillion and over	12 trillion and over	0	gov. and LDP plan
98.3.26	16 trillion and over	16 trillion and over	0	coalition parties guideline
98.3.29	16 trillion and over	12-13 trillion and over	3-4 trillion	gov. and LDP plan
98.4.9	16 trillion and over	12 trillion and over	4 trillion	prime minister
98.4.24	16.65 trillion	12.65 trillion	4 trillion	gov. final decision

98.11.16 Morning: Emergency Economic Package

	Total amount including tax cut	Total amount excluding tax cut	permanent tax cut	Source of the announcement
98.10.6午前	17 trillion and over	10 trillion and over	about 7 trillion	prime minister
98.11.12	20 trillion and over	13 trillion and over	about 7 trillion	gov. outlook
98.11.16午前	23.9 trillion	17.9 trillion yen	6 trillion	gov. final decision

99.11.11 Morning: Measures for the rebirth of the Japanese economy

	Total amount	Source of the announcement
99.10.8 morning	10 trillion and over	prime minister's plan
99.10.22	11 - 12 trillion	gov. and LDP skeleton
99.11.3	15 trillion	gov. outlook
99.11.10	17 trillion	news report on gov. final decision
99.11.11 morning	18 trillion	gov. final decision

2000.10.19 morning: Policy Package for New Economic Development Measures for the Rebirth of Japan

	Total amount	Source of the announcement
00.10.13	10 trillion and over	gov. plan
00.10.17 morning	about 11 trillion	finance minister
00.10.19 morning	about 11 trillion	final decision by cabinet members

Sources) Cabinet Office, Japanese Government, Nikkei News Paper, Asahi News Paper, and Yomiuri News Paper.

Table 4. The Determinants of the Amount of Fiscal ExpenditureDependent Variable: $G_t - G_{t-T}$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.784	0.716	3.887	0.001
$S_{t-1} - S_{t-2}$	-0.003	0.001	-2.151	0.041
ΔIIP	0.470	0.324	1.447	0.159
FALL	-2.095	0.820	-2.555	0.017
INITIAL	-4.576	1.006	-4.549	0.000
R-squared	0.514	Mean dependent var		0.141
Adjusted R-squared	0.442	S.D. dependent var		3.029
S.E. of regression	2.263	Akaike info criterion		4.614
Sum squared resid	138.256	Schwarz criterion		4.843
Log likelihood	-68.820	Hannan-Quinn criter.		4.690
F-statistic	7.136	Durbin-Watson stat		2.194

Dependent Variable: $G_t - G_{t-T}$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.447	4.015	2.353	0.026
S_{t-1}	0.000	0.000	-1.744	0.093
ΔIIP	0.308	0.324	0.949	0.351
FALL	-2.463	0.857	-2.872	0.008
INITIAL	-4.757	1.050	-4.531	0.000
R-squared	0.488	Mean dependent var		0.141
Adjusted R-squared	0.412	S.D. dependent var		3.029
S.E. of regression	2.322	Akaike info criterion		4.665
Sum squared resid	145.551	Schwarz criterion		4.894
Log likelihood	-69.643	Hannan-Quinn criter.		4.741
F-statistic	6.440	Durbin-Watson stat		2.103

Notes) Definition of the explanatory variables; C = constant term, ΔIIP = change of industrial production index in the last month, FALL = fall season dummy, and INITIAL = initial dummy for each fiscal package.

Table 5. The Changes of Announced Amount for Each Stimulus Package in 2008 and 2009

Comprehensive Immediate Policy Package -Easing Public Anxiety- (8/29/2008)

	total size	national gov. expenditur	Source of the announcement
2008/8/17	n.a.	2-3 trillion	LDP politician
2008/8/28	about 10 trillion	about 1 trillion	gov. skeleton
2008/8/29 morning	about 11 trillion	n.a.	agreement between gov. and LDP
2008/8/29	about 11.7 trillion	2 trillion	gov. final decision

Measures to Counter Difficulties in People's Daily Lives (2008/10/30)

	total size	national gov. expenditur	cash handout	Source of the announcement
2008/10/22	n.a.	5 trillion	2 trillion	gov. skeleton
2008/10/30	about 26.9 trillion yen	5 trillion	2 trillion	gov. final decision

Immediate Policy Package to Safeguard People's Daily Lives (2008/12/19)

	total size	national gov. expenditur	Source of the announcement
2008/12/12	about 44 trillion	about 10 trillion	prime minister
2008/12/19 morning	about 43 trillion	n.a.	cabinet meeting
2008/12/19	about 43 trillion	about 10 trillion	gov. final decision

Countermeasures to Address the Economic Crisis (2009/4/10)

	total size	national gov. expenditur	tax cut	Source of the announcement
2009/3/31	n.a.	10 trillion and over		prime minister
2009/4/4	n.a.	more than 10 trillion		gov. outlook
2009/4/6	n.a.	11-14 trillion		gov. internal approval
2009/4/8	56 trillion and over	about 15 trillion	about 0.1 trillion	gov. and coalition parties agreement
2009/4/9 morning	56.8 trillion	15.4 trillion	0.1 trillion	LDP approval
2009/4/10	56.8 trillion	15.4 trillion		gov. final decision

Emergency Economic Countermeasures for Future Growth and Security (2009/12/8)

	total size	national gov. expenditur	Source of the announcement
2009/11/27	n.a.	2.7 trillion	gov. initial outlook
2009/11/30 morning	10 trillion and over	2.7 trillion and over	prime minister
2009/12/1	n.a.	about 4 trillion	working group
2009/12/2	much larger than 10 tril.	about 4 trillion	working group
2009/12/2	about 20 trillion	about 4 trillion	gov. guideline
2009/12/3	about 24 trillion	about 4 trillion	working group (final)
2009/12/7	n.a.	about 4 trillion and over	cabinet amendment
2009/12/8	about 24.4 trillion	4.2 trillion	cabinet final decision

Note 1) The announcement on October 22, 2008, referred to 2 trillion tax cut rather than 2 trillion cash handout.

Table 6. The Determinants of the Amount of Fiscal Expenditure in 2008 and 2009

Dependent Variable: $G_t - G_{t-T}$				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.811	1.314	1.378	0.190
$S_{t-1} - S_{t-2}$	0.005	0.002	2.102	0.054
ΔIIP	-0.582	0.273	-2.129	0.052
FALL	-1.310	1.524	-0.860	0.405
INITIAL	-5.192	2.226	-2.333	0.035
R-squared	0.379	Mean dependent var		0.089
Adjusted R-squared	0.201	S.D. dependent var		3.438
S.E. of regression	3.073	Akaike info criterion		5.304
Sum squared resid	132.164	Schwarz criterion		5.552
Log likelihood	-45.386	F-statistic		2.135
Durbin-Watson stat	1.564	Prob(F-statistic)		0.130

Dependent Variable: $G_t - G_{t-T}$				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.280	6.742	0.486	0.634
S_{t-1}	0.000	0.001	-0.266	0.795
ΔIIP	-0.431	0.304	-1.417	0.178
FALL	-0.863	1.954	-0.442	0.665
INITIAL	-3.361	2.361	-1.424	0.177
R-squared	0.187	Mean dependent var		0.089
Adjusted R-squared	-0.045	S.D. dependent var		3.438
S.E. of regression	3.515	Akaike info criterion		5.573
Sum squared resid	173.003	Schwarz criterion		5.822
Log likelihood	-47.944	F-statistic		0.805
Durbin-Watson stat	2.041	Prob(F-statistic)		0.542

Notes) Definition of the explanatory variables; C = constant term, ΔIIP = change of industrial production index in the last month, FALL = fall season dummy, and INITIAL = initial dummy for each fiscal package.

Table 7. The Effects of the Fiscal Announcements in the Packages

	fall in 1992 sample period: 8/4-9/24		spring in 1993 sample period: 3/12-4/30		fall in 1993 sample period: 8/31-10/25		spring in 1994 sample period: 1/4-2/28	
D1	0.0289 (1.760)*	0.0285 (1.690)*	0.0295 (2.847)**	0.0284 (2.755)**	-0.0029 (-0.535)	-0.0027 (-0.481)	0.0069 (0.571)	0.0069 (0.571)
D2	0.0077 (0.471)	0.0074 (0.448)	0.0212 (2.045)**	0.0202 (1.962)*			0.0551 (4.558)**	0.0551 (4.558)**
D3	0.0574 (3.387)**	0.0576 (3.335)**	0.0245 (2.368)**	0.0239 (2.327)**			0.0016 (0.132)	0.0016 (0.132)
D4	0.0255 (1.576)	0.0253 (1.548)					-0.0197 (-1.661)*	-0.0197 (-1.661)*
Dcall	-0.003 (-0.146)		0.001 (0.182)		-0.0047 (-0.535)		-0.0560 (-0.868)	
Call _t		-0.006 (-0.200)		-0.003 (-0.608)		-0.0053 (-0.820)		-0.0441 (-0.673)
Call _{t-1}		0.001 (0.046)		-0.005 (-0.906)		0.0042 (0.649)		0.0671 (1.026)
Dummy					0.0089 (1.463)	0.0089 (1.454)		

	fall in 1995 sample period: 9/1-10/13		fall in 1998 sample period: 3/4-5/8		fall in 1998 sample period: 10/1-11/30		fall in 1999 sample period: 10/1-11/30	
D1	0.0080 (1.010)	0.0080 (0.950)	0.0197 (1.956)*	0.0192 (1.920)*	-0.0059 (-0.407)	-0.0059 (-0.397)	0.0099 (1.282)	0.0095 (1.225)
D2	-0.0038 (-0.464)	-0.0042 (-0.503)	0.0050 (0.502)	0.0050 (0.489)	0.0006 (0.039)	0.00056 (0.038)	0.0138 (1.822)*	0.0146 (1.890)*
D3			0.0140 (1.372)	0.0168 (1.618)			-0.0038 (-0.495)	-0.0042 (-0.542)
D4			-0.0092 (-0.915)	-0.0099 (-0.986)				
D5			0.0275 (2.732)**	0.0270 (2.699)**				
Dcall	-0.0442 (-1.363)		0.0163 (1.643)		-0.0041 (-0.131)		-0.1617 (-1.404)	
Call _t		-0.0456 (-1.394)		0.0258 (2.082)		-0.0039 (-0.397)		-0.0552 (-0.283)
Call _{t-1}		0.0419 (1.271)		-0.0076 (-0.631)		0.0006 (0.038)		0.2699 (1.371)
MDummy	0.0255 (1.671)	0.0263 (1.703)*						

Table 7. The Effects of the Fiscal Announcements in the Packages (continued)

	Oct-00 sample period: 9.18-11.15		Aug-08 sample period: 8.1-9.30		Apr-09 sample period: 3.2-4.30		Dec-09 sample period: 11.4-12.30	
D1	-0.0013 (-0.088)	-0.001 (-0.068)	0.0098 -0.782	0.0082 -0.638	-0.0064 (-0.291)	-0.005 (-0.181)	0.012 -1.145	0.0169 -1.621
D2	-0.0111 (-0.823)	-0.0113 (-0.820)	0.0025 -0.201	0.0001 -0.01	-0.006 (-0.269)	-0.006 (-0.267)	0.0156 -1.544	0.0151 -1.631
D3					-0.0128 (-0.580)	-0.0122 (-0.527)	0.0324 (3.240)*	0.0332 (3.590)*
D4					0.04 (1.810)**	0.0404 (1.762)**	-0.0025 (-0.252)	0.0003 -0.038
Call	-0.2139 (-1.099)		-0.0417 (-0.256)		-0.1819 (-0.249)		0.1949 -0.553	
Call(t)		-0.1844 (-0.709)		0.0698 -0.3102		-0.2372 (-0.238)		-0.1383 (-0.394)
Call(t-1)		0.2493 -0.879		0.1503 -0.6759		0.0996 -0.083		-0.6883 (-1.654)
MDummy2							0.0294 (2.942)*	0.0293 (3.175)*

Notes 1) t-value is in the parenthesis, ** = 5% significance level, * = 10% significance level.

2) Constant term was included in the regressions but not shown in the table.

3) MDummy1 takes one when BOJ cuts its discount rate and zero otherwise.

4) MDummy2 takes one when BOJ announced a new easing policy on December 1, 2009 and zero otherwise.

5) Each dummy variable takes one on the following date and zero otherwise.

fall in 1992: D1=August 24 AM, D2=August 25 AM, D3=August 27 AM, D4=August 28 AM.

spring in 1993: D1=April 2 AM, D2=April 7 AM, D3=April 12 PM.

fall in 1993: D1=September 17 AM.

spring in 1994: D1=January 26 AM, D2=January 31 AM, D3=January 3 PM, D4=January 9 AM.

fall in 1995: D1=September 19 AM, D2=September 20 AM.

spring in 1998: D1=March 26 AM, D2=March 30 AM, D3=April 6 AM, D4=April 10 AM, D5=April 24 AM.

fall in 1999: D1=November 13 AM, D2=November 16 AM.

fall in 1999: D1=October 25 AM, D2=November 4 AM, D3=November 11 AM.

"fall in 2000: D1=October 14 AM, D2=October 17 AM.

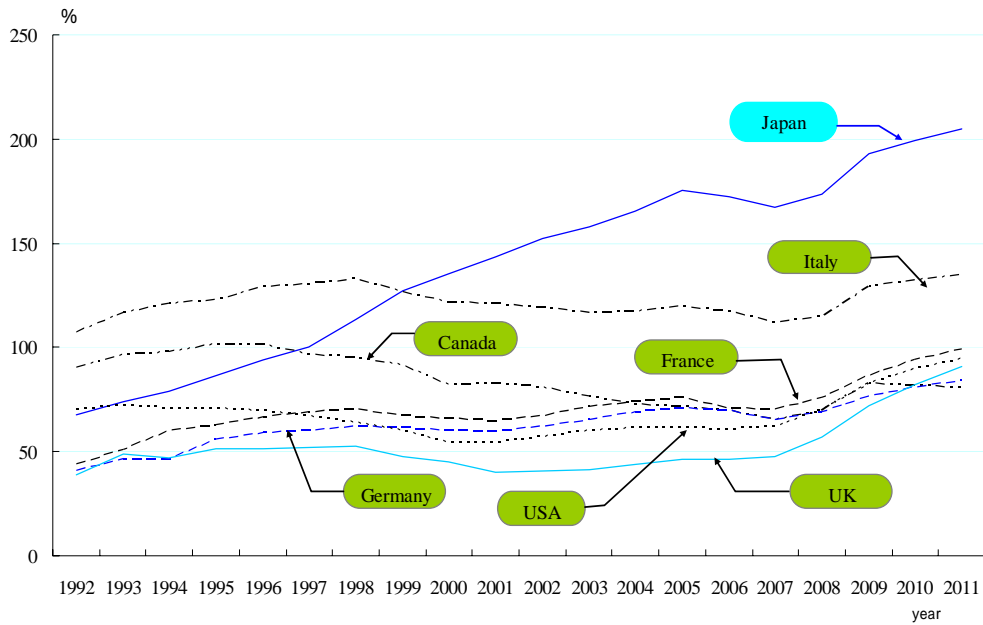
fall in 2008: D1=August 29 AM, D2=September 1 AM.

spring in 2009: D1=April 1 AM, D2=April 7 AM, D3=April 9 AM, D4=April 10 PM.

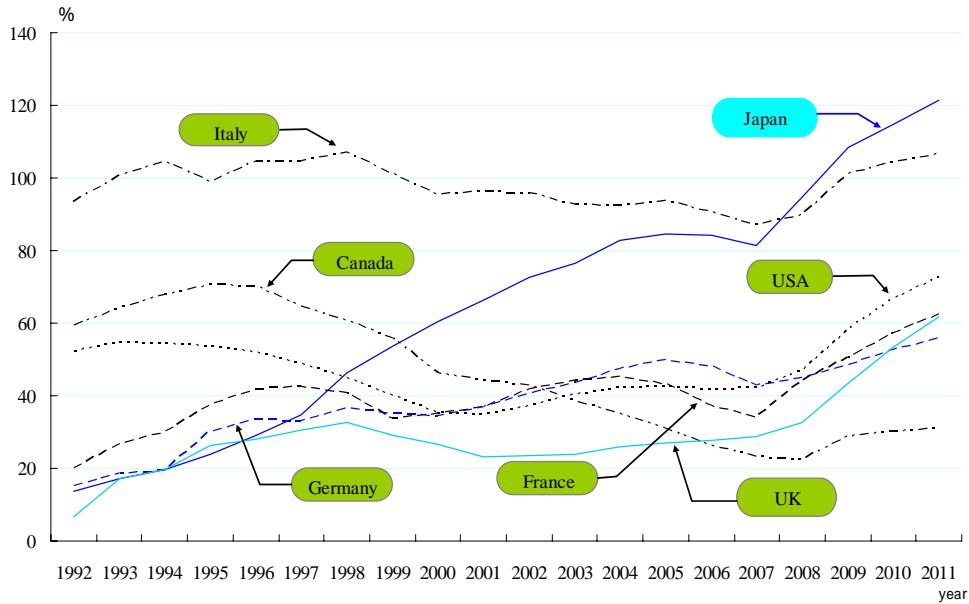
fall in 2009: D1=November 30 AM, D2=December 2 AM, D3=December 3 PM, D4=December 8 AM.

Figure 1 General Government Financial Liabilities in Selected OECD Countries

(1) Gross Financial Liabilities



(2) Net Financial Liabilities



Source) OECD Economic Outlook No. 87.