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Is Abe's Fiscal Policy Loose or Tight?

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1. Introduction

Since December 2012, the Abe administration has adopted a comprehensive economic policy package, “Abenomics.” It consists of the three “policy arrows”: aggressive monetary policy, flexible fiscal policy and growth strategy. The aims of Abenomics is to sustainably revive the Japanese economy while maintaining fiscal discipline. The second arrow of Abenomics does not mean just fiscal stimulus. The Abe administration decided the fiscal consolidation target as “Basic Policies for the Economic and Fiscal Management and Reform 2014” in June 2014. This target is to halve the primary deficit of the central and local governments to GDP ratio by fiscal 2015 from the ratio in fiscal 2010 and to achieve a primary surplus by fiscal 2020.

The Abe administration has improved the primary balance as shown in Figure 1. The target in fiscal 2015 (to halve the primary deficit to GDP ratio from the ratio in fiscal 2010) has been achieved.

On the other hand, though consumption tax rate was raised from 5% to 8% in April 2014, the Abe administration decided twice to postpone its rate hike from 8% to 10%. In addition, a fiscal stimulus package including 13.5 trillion yen of fiscal measures was implemented as “Economic Measures for Realizing Investment for the Future” in August 2016, nevertheless unemployment rate reached historically low levels.

Does the Abe administration commit to fiscal consolidation? We investigate fiscal policy stance of the Abe administration by using an objective
index. We employ an index proposed by Polito and Wickens (2012).

Figure 1
Primary balance to GDP ratio

Source: OECD Economic Outlook.

2. Japan's Fiscal Situation

Japan’s fiscal situation is still bad, though the Abe administration puts effort into fiscal consolidation. As shown in Figure 1, Japan’s primary balance continues to improve, but is the worst in G7 countries. In the global financial crisis in 2007, budget deficit rapidly enlarged in industrial countries. However, it shrank afterward. Among G7 countries, Japan’s recovery has been so slow, as shown in Figure 1.

Though Japan’s primary deficit got well, the Abe administration does not seem to take fiscal austerity. The Abe administration raised consumption tax rate from 5% to 8% and controlled an increase in social security expenses. However, Figure 2 indicates that Japan’s cyclically adjusted fiscal deficit is still large, as a ratio potential GDP. Most recently, its deficit is worse than before the global financial crisis.
3. Indexes for Evaluating of Fiscal Policy Stance

In previous work, there are several methods to evaluate fiscal policy stance. A VAR model is used to estimate parameters of Japan’s fiscal policy in Doi, Hoshi, and Okimoto (2012), Ko and Morita (2015), and so on. They assess whether Japan’s fiscal policy is Ricardian or non Ricardian.

European Commission proposes S1 or S2 indicators. IMF creates an index of Fiscal Space.

Polito and Wickens (2012) develops Fiscal Stance Index (FSI). FSI is based on a comparison of the desired debt-GDP ratio in the future with a forecast of its value if fiscal stance at that time would continue to maintain. Polito and Wickens (2012) analyzes FSI in European countries and the US, not including Japan.

4. Framework of Analyses

In order to evaluate fiscal policy stance of the Abe administration, we estimate FSI. Is Abe’s stance consistent with fiscal sustainability, though the
Abe administration has fiscal consolidation target?

Government budget constraint is

\[ P_t g_t + (1 + R_t) B_{t-1} = B_t + P_t T_t \]

where \( P_t \): price level, \( g_t \): real government expenditure, \( B_t \): outstanding of nominal government bond at the end of period \( t \), \( R_t \): nominal interest rate, \( T_t \): real government revenue (not including seigniorage).

By dividing through nominal GDP, we obtain

\[ \frac{g_t}{y_t} + \frac{1 + R_t}{(1 + \pi_t)(1 + \gamma_t)} \frac{b_{t-1}}{y_{t-1}} = \frac{b_t}{y_t} + \frac{T_t}{y_t} \]

where \( y_t \): real GDP, \( \pi_t \): inflation rate, \( \gamma_t \): real growth rate, \( B_t = \frac{B}{P_t} \).

If we define \( 1 + \rho_t = \frac{1 + R_t}{(1 + \pi_t)(1 + \gamma_t)} \) and approximately \( \rho_t = R_t - \pi_t - \gamma_t \), we can rewrite

\[ \frac{b_t}{y_t} = (1 + \rho_t) \frac{b_{t-1}}{y_{t-1}} + \frac{g_t}{b} \frac{y_{t-1}}{y_t} - \frac{T_t}{y_t} \]

In order to log-linearize the above equation, we obtain

\[ \exp \left[ \ln \frac{b_t}{y_t} \right] - \exp \left[ \ln(1 + \rho_t) + \ln \frac{b_{t-1}}{y_{t-1}} \right] - \exp \left[ \ln \frac{g_t}{y_t} \right] + \exp \left[ \ln \frac{T_t}{y_t} \right] = 0 \]

and a first-order Taylor series approximation to \( f(x) = \exp[\ln x] \) about \( \ln x \) is

\( f(x) \approx x \left[ 1 + (\ln x - \ln x) \right] \)

(\( x \) is a some argument). Then a log-linear approximation to the government budget constraint becomes

\[ \ln \frac{b_t}{y_t} = c + (1 + \rho) \ln(1 + \rho_t) + (1 + \rho) \ln \frac{b_{t-1}}{y_{t-1}} + \frac{g_t}{b} \frac{y_{t-1}}{y_t} - \rho \ln \frac{b_t}{y_t} - \frac{T_t}{y_t} \]

where \( c = -(1 + \rho) \ln(1 + \rho) - \rho \ln \frac{b_t}{y_t} - \frac{g_t}{b} \frac{y_{t-1}}{y_t} + \frac{T_t}{y_t} \).

We can solve the above equation forward \( n \) periods to obtain

\[ \ln \frac{b_t}{y_t} = (1 + \rho)^{-n} \left[ \ln \frac{b_{t+n}}{y_{t+n}} \right] - \sum_{s=1}^{n} (1 + \rho)^{-s} E_t \left[ k_{t+s} \right] \]

where \( k_t = c + (1 + \rho) \ln(1 + \rho_t) + \frac{g_t}{b} \frac{y_{t-1}}{y_t} - \rho \ln \frac{b_t}{y_t} - \frac{T_t}{y_t} \)

Now, no Ponzi game condition is

\[ \lim_{n \to 0} (1 + \rho)^{-n} E_t \left[ \ln \frac{b_{t+n}}{y_{t+n}} \right] = 0 \]
Hence the government budget constraint when the government debt is sustainable, defined in Hamilton and Flavin (1986), can be written as

$$\ln \frac{b_{t}}{y_{t}} = -\sum_{s=1}^{\infty} (1+\rho)^{-s} E_t[k_{t+s}]$$

If the target level of the debt-GDP ratio for a given n period sets \( \left( \frac{b_{tn}}{y_{tn}} \right)^* \), the following relationship is held,

$$(1+\rho)^{-n} \ln \left( \frac{b_{tn}}{y_{tn}} \right)^* - \left[ \ln \frac{b_{t}}{y_{t}} + \sum_{s=1}^{n} (1+\rho)^{-s} E_t[k_{t+s}] \right] = 0$$

Polito and Wickens (2012) defines the FSI as an index for evaluating whether the target level can be achieved.

$$(1+\rho)^{-n} \ln \left( \frac{b_{tn}}{y_{tn}} \right)^* - \left[ \ln \frac{b_{t}}{y_{t}} + \sum_{s=1}^{n} (1+\rho)^{-s} E_t[k_{t+s}] \right] \geq 0$$

We express the left-hand side of the above equation as \( FS(t, n) \), and Fiscal Stance Index is established as follows

$$FSI(t, n) = \exp[FS(t, n)] = \frac{(1+\rho)^{-n} \ln \left( \frac{b_{tn}}{y_{tn}} \right)^*}{\frac{b_{t}}{y_{t}} \exp \left[ \sum_{s=1}^{n} (1+\rho)^{-s} E_t[k_{t+s}] \right]}$$

If FSI \( \geq 1 \), fiscal stance at that time can be evaluated that fiscal sustainability is ensured. On the other hand, if FSI < 1, fiscal stance at that time can be evaluated that fiscal sustainability is not ensured.

For simplicity, the target level of the debt-GDP ratio is assumed to be its current level, \( \left( \frac{b_{tn}}{y_{tn}} \right)^* = \frac{b_{t}}{y_{t}} \).

Hence, we obtain

$$FS(t, n) = [(1+\rho)^{-n} - 1] \ln \frac{b_{t}}{y_{t}} - \sum_{s=1}^{n} (1+\rho)^{-s} E_t[k_{t+s}]$$

It means

$$FSI(t, n) = \frac{K_{t,n}}{b_{t}/y_{t}} \quad (1)$$

where \( K_{t,n} = \exp \left[ \frac{1}{1-(1+\rho)^{-n}} \sum_{s=1}^{n} (1+\rho)^{-s} E_t[k_{t+s}] \right]$$

\(^1\) Blanchard et al. (1990) adopts the debt-GDP ratio at the beginning of planning periods as the debt-GDP target.
In order to estimate FSI, we need to estimate $E_t[k_{t+1}]$.

Recently, the bank of Japan (BOJ) purchases a lot of the Japanese government bonds (JGBs). Figure 3 indicates that the BOJ held about 40% of JGBs in the third quarter of 2016. Hence the BOJ is suspected to monetize government debt.

Figure 3
Composition of BOJ’s Holdings of JGBs

So we also evaluate fiscal stance under the current monetary policy, quantitative and qualitative monetary easing (QQE). In order to investigate the stance, we include the budget constraint of the BOJ into the government budget constraint. Polito and Wickens (2012) analyzes only fiscal stance of the general government.2

In order to establish the budget constraint of the consolidated government, we write both budget constraints of the general government and the BOJ. We can write the budget constraint of the general government as follows

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2 Strictly, analyses in Polito and Wickens (2012) include seigniorage but not exclude the government bonds held by the central bank in the budget constraints.
\[ P_t g_t + (1 + R_t^N) B_{t-1}^N = B_t^N + P_t cb_t + P_t T_t^N \]

where \( cb_t \): real transfer from the BOJ to the national government, \( B_t^N \): nominal net debt of government at the end of period t, \( R_t^N \): nominal net interest rate (= (interest payment – interest receipts)/net debt, \( T_t^N \): real government revenue excluding interest receipts

Also we obtain the budget constraint of the BOJ,
\[ P_t b_t + B_t^C - B_{t-1}^C = R_t^N B_{t-1}^C + M_t - M_{t-1} \]

where \( B_t^C \): outstanding of nominal government bond held by the BOJ, \( M_t \): monetary base,

By combining both budget constraint, we obtain
\[ P_t g_t + (1 + R_t^N) B_{t-1}^N = B_t^N + P_t T_t^N + M_t - M_{t-1} \]

where \( B_{t}^{NC} \equiv B_t^N - B_t^C \)

In the above equation, \( M_t - M_{t-1} \) is seigniorage in nominal terms. By dividing through nominal GDP, we obtain
\[ \frac{g_t}{y_t} + (1 + \rho_t^N) \frac{b_{t-1}^{NC}}{y_{t-1}} = \frac{b_t^{NC}}{y_t} + \frac{\nu_t}{y_t} \]

where \( b_t^{NC} \equiv \frac{B_t^{NC}}{P_t} \), \( m_t \equiv \frac{M_t}{P_t} \), \( \nu_t \equiv T_t^N + m_t - \frac{m_{t-1}}{1 + \pi_t} \), \( \rho_t^N = R_t^N - \pi_t - \gamma_t \)

\( \nu_t \) includes seigniorage in real terms. Similarly with the case of only the general government, we define
\[ FSI(t, n) = [(1 + \rho^N)^{n-1} - 1] \ln \frac{b_t^{NC}}{y_t} - \sum_{s=1}^{n} (1 + \rho^N)^{-s} E_t \left[ k_{t+s}^N \right] \]

where
\[ c^N = -(1 + \rho^N) \ln(1 + \rho^N) - \rho^N \ln \frac{b_t^{NC}}{y_t} - \frac{g}{b_t^{NC}} \ln \frac{g}{y} + \frac{\nu}{b_t^{NC}} \ln \frac{\nu}{y} \]
\[ k_t^N = c^N + (1 + \rho^N) \ln(1 + \rho_t^N) + \frac{g}{b_t^{NC}} \ln \frac{g}{y_t} - \frac{\nu}{b_t^{NC}} \ln \frac{\nu}{y_t} \]

Therefore, FSI in this case is expressed as
\[ FSI(t, n) = \frac{K_{t,n}^N}{b_t^{NC}/y_t} \]

where
\[ K_{t,n}^N = \exp \left[ \frac{1}{1 - (1 + \rho^N)^{-n} \sum_{s=1}^{n} (1 + \rho^N)^{-s} E_t \left[ k_{t+s}^N \right]} \right] \]
5. Evaluating Abe’s Fiscal Stance

First, in order to estimate \( E_t[k_{t+s}] \), we choose economic and fiscal variables \((z_t)\) to affect \( k_t \). In the case of the general government, we set

\[
z_t = \left( \ln \frac{b_t}{y_t}, \ln \frac{g_t}{y_t}, \ln \frac{T_t}{y_t}, \ln \frac{\pi_t}{y_t}, \ln(1 + R^L_t), \ln(1 + R^S_t) \right)
\]

where \( y_t^* \): potential GDP, \( R^L_t \): long-term interest rate, \( R^S_t \): short-term interest rate.

In the case of the consolidated government including BOJ,

\[
z_t = \left( \ln \frac{b_{t,NC}}{y_t}, \ln \frac{g_t}{y_t}, \ln \frac{v_t}{y_t}, \ln \frac{\pi_t}{y_t}, \ln(1 + R^L_t), \ln(1 + R^S_t) \right)
\]

Given \( n \), we can establish the following VAR(p) model to estimate \( E_t[k_{t+s}] \)

\[
z_t = A_0 + \sum_{i=1}^{p} A_i z_{t-i} + e_t
\]

\[
k_t = \alpha + \beta' z_t
\]

(2)

where \( \alpha \): constant term, \( \beta \): coefficient vector.

By using estimation results of the above VAR model, we can drive \( E_t[z_{t+s}] \).

Also we can drive \( E_t[k_{t+s}] = \alpha + \beta' E_t[z_{t+s}] \).

Concerning data of \( z_t \), we get quarterly data of GDP from Cabinet Office “Annual Report on National Accounts”, data of GDP gap from Cabinet Office, data of fiscal variables from updated estimation based on Doi, Hoshi, and Okimoto (2012). Also we obtain quarterly data of monetary variables from BOJ “Flow of Funds.”

Figure 4 denotes government expenditure (g/y), government revenue without seigniorage (t/y), and government revenue including seigniorage (v/y), all measured as a proportion to GDP from 2007. In period of the Abe administration (after 2013), expenditure (g/y) was almost constant, but revenue (t/y or v/y) increased.

Reflecting such a situation, primary balance to GDP ratio (PB/y) improved and seigniorage to GDP ratio (dm/y) increased, shown in Figure 5.
In order to estimate $E_t[k_{rs}]$, we estimate the VAR(2) model over the period 1980q1–1990q1 and employ recursive estimation from 1990q2 to 2016q3. The VAR estimates for this rolling sample may be denoted $\alpha$ and $\beta$. 
following Polito and Wickens (2012). We calculate the average of each variables over sample period in estimating \( c \) and \( k \). We set \( n = 8 \) (two years) and \( n = 20 \) (five years).

For example, Table 1 reports an estimation result of the regression equation of \( k \), equation (2), over the period 1980q1–2016q3. Based on this result, forecast value of \( k \), \( E[k_{t+s}] \) \((s=1, \ldots , n,)\), is calculated as described in Figure 6. We also estimate the regression equation of \( k \) and calculate forecast value of \( k \) with changing end period.

Table 1
Estimation Result

<table>
<thead>
<tr>
<th>Dependent variable: k</th>
<th>Sample period: 1980q1-2016q3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coef.</td>
</tr>
<tr>
<td>ln(b/y)</td>
<td>-0.043</td>
</tr>
<tr>
<td>ln(g/y)</td>
<td>0.287</td>
</tr>
<tr>
<td>ln(t/y)</td>
<td>-0.152</td>
</tr>
<tr>
<td>ln(y/y*)</td>
<td>-0.345</td>
</tr>
<tr>
<td>ln(1+( \pi ))</td>
<td>-0.180</td>
</tr>
<tr>
<td>ln(1+R^L)</td>
<td>0.343</td>
</tr>
<tr>
<td>ln(1+R^S)</td>
<td>-0.212</td>
</tr>
<tr>
<td>_cons</td>
<td>0.136</td>
</tr>
</tbody>
</table>

N O B          147
Adj.-R\(^2\)   0.899
Note: White consistent S.E.
Finally we obtain the value of FSI based on equation (1) corresponding to each end period of the regression. Figure 7 displays the value of FSI in the case of the general government from 1990q1–2016q3. Values after 2007 is magnified in lower figure.

Figure 7 implies that FSI is less than unity in almost all periods after 2000. FSI in Figure 7 increases from 2013 to 2014, but slightly deteriorates (n = 8) or stop improving (n = 20) from 2015 to 2016. It suggests that fiscal stance of the Abe administration does not ensure fiscal sustainability, since FSI is considerably less than unity, nonetheless FSI increases due to consumption tax hike.

FSI is more than unity when the Hashimoto administration implemented Fiscal Structural Reform from 1996 to 1997 and the Koizumi administration committed the fiscal consolidation target to achieve a primary surplus by fiscal 2011, shown in Figure 7. Though the Abe administration decided the fiscal consolidation target to achieve a primary surplus by fiscal 2020, fiscal stance of the Abe administration does not be effective to ensure fiscal sustainability.
Next, we calculate the value of FSI in the case of the consolidated government. Seigniorage is included into government revenue. In the side of government debt, the debt-GDP target is set in terms of net debt excluding
Figure 8 indicates net debt excluding BOJ-held bonds to GDP ratio decline after 2013.

Figure 8
Debt-GDP Ratio

FSI in Figure 9 is quite different from one in Figure 7. It implies that seigniorage revenue becomes to ensure fiscal sustainability under the Abe administration. In Figure 9, we set net debt excluding government bond held by the BOJ as the government debt. In the case of the consolidated government, the increment of monetary base is included in government revenue, but monetary base is not include in government debt. It means that the BOJ will perpetually hold the JGBs which will be once purchased by the BOJ. If the BOJ will sell the JGBs, they will be purely the government debt.
that have to be redeemed by the government.

Figure 9
FSI (Consolidated Government)

In fact, agencies of the private sector lose interest receipts of the government bonds purchased by the BOJ at each period. We can denote lost
interest receipts in the private sector by the BOJ-held bonds as $R_t^N B_{t-1}^C$ in nominal terms. The lost interest receipts means the gain of the government. However, the BOJ has purchase the JGBs to halt the deflation. The BOJ will stop purchasing the JGBs or sell them when the deflation will end. If the BOJ will sell the JGBs at some future time, the government will not obtain the gain from the time.

Fukao (2007) argues that the increment of monetary base is equivalent to the present value of lost interest receipts in the private sector if the BOJ will perpetually hold the JGBs which will be once purchased by the BOJ as the seigniorage. Conversely, if the BOJ will sell the JGBs someday, the increment of monetary base is overestimated as the seigniorage in terms of the present value.

Now, $M_t = B_t^C$ under the budget constraint of the BOJ. $R_t^N$ is assumed to be constant ($R^N$). In this setting, the present value of lost interest receipts in the private sector if the BOJ will perpetually hold the JGBs can be written as

$$\sum_{i=1}^{\infty} \frac{R_t^N B_{i-1}^C}{(1 + R^N)^i} = R_t^N B_{t-1}^C = B_{t-1}^C = M_{t-1}$$

If the BOJ will sell the JGBs at period $t+H-1$, the present value of lost interest receipts in the private sector is expressed as

$$\sum_{i=t}^{t+H-1} \frac{R_t^N B_{i-1}^C}{(1 + R^N)^i} = B_{t-1}^C \left\{ 1 - \frac{1}{(1 + R^N)^H} \right\}$$

After period $t+H$, the government will have to pay interest of the government bonds. In such a situation, the government will lose the present value of interest payment after period $t+H$. The loss will be

$$\sum_{i=t+H}^{\infty} \frac{R_t^N B_{i-1}^C}{(1 + R^N)^i} = B_{t-1}^C - B_{t-1}^C \left\{ 1 - \frac{1}{(1 + R^N)^H} \right\} = \frac{B_{t-1}^C}{(1 + R^N)^H} = \frac{M_{t-1}}{(1 + R^N)^H}$$

The value is the overvalued seigniorage revenue at period $t-1$ in the budget constraint of the consolidated government, though it is not possible to predict when the deflation will ends.

Indeed, the fiscal stance of the Abe administration ensures fiscal sustainability in the case of the consolidated government, but this evaluation is on the assumption that the BOJ will perpetually hold the JGBs which will be once purchased by the BOJ, which is not possible when the deflation will end.
6. Concluding Remarks

We evaluate fiscal policy stance of Abe administration in this paper. The index of the fiscal stance is based on the definition proposed by Polito and Wickens (2012). According to the estimated value of the index in this paper, we assess that the Abe administration does not commit to fiscal consolidation. Securing tax revenues and cutting government expenditure are not enough to ensure fiscal sustainability. In this sense, the Abe’s fiscal policy is loose.

However, the fiscal stance including seigniorage or inflation tax in the Abe administration ensures fiscal sustainability. It means that the fiscal stance is sustainable if seigniorage or inflation tax can be provided for reducing government debt. This situation is on the assumption that the BOJ will perpetually hold the JGBs which will be once purchased by the BOJ. The seigniorage revenue in the budget constraint of the consolidated government including the BOJ is overvalued, if the BOJ will sell the JGBs when the deflation will halts.

The Abe administration decided the fiscal consolidation target that the primary deficit of the central and local governments to GDP ratio is halved by fiscal 2015 from the ratio in fiscal 2010 and a primary surplus is achieved by fiscal 2020. The primary balance has been improved under the Abe administration and the target in fiscal 2015 has been achieved. However, the estimated index of the fiscal stance in this paper suggests that the Abe’s fiscal stance is not sustainable.

Reference