Munich Personal RePEc Archive

Revision of the Non-Divergence Condition (so-called Domar condition) for Government Debt-to-GDP Ratio – Taking into account consumption from assets or interest income

Tanaka, Yasuhito

31 January 2026

Online at https://mpra.ub.uni-muenchen.de/128715/
MPRA Paper No. 128715, posted 15 Apr 2026 07:04 UTC

Revision of the Non-Divergence Condition (so-called Domar condition) for Government Debt-to-GDP Ratio – Taking into account consumption from assets or interest income

Yasuhito Tanaka
ochibocho@gmail.com

Government debt creates private financial assets, but these are not necessarily government bonds. Financial assets are created when the private sector receives an amount exceeding tax revenue—that is, a fiscal deficit—through government spending.

However, interest income from government debt arises from interest on government bonds. For government bonds held by the Bank of Japan, the interest income is the interest on the Bank of Japan current accounts that banks received in exchange for the bonds. If the accumulation of financial assets or interest income increases people's consumption demand, reducing the fiscal deficit by that amount can achieve the same economic conditions—namely, the same nominal growth.

Hereafter, consumption driven by the wealth effect shall be treated as consumption driven by interest income. First (setting aside overseas factors),

$$\text{GDP} = \text{Consumption} + \text{Investment} + \text{Government Spending}.$$

Assuming the Consumption depends on GDP+Interest income−Taxes−Investment,

$$\begin{aligned}\text{Consumption} = {} & \text{Propensity to Consume} \times (\text{GDP} - \text{Taxes} \\ & + \text{Government Debt} \times \text{Interest rate} - \text{Invetsment}).\end{aligned} \tag{1}$$

If consumers are both workers and shareholders, and companies are run by shareholders, consumption depends on income including interest minus taxes and investment. Therefore,

$$\begin{aligned}\text{Fiscal Deficit} = {} & \text{Government Spending} - \text{Taxes} \\ = {} & \text{GDP} - \text{Consumption} - \text{Investment} - \text{Taxes} \\ = {} & (1 - \text{Propensity to Consume}) \times (\text{GDP} - \text{Taxes} - \text{Investnent}) \\ & - \text{Propensity to Consume} \times \text{Government Debt} \times \text{Interest Rate}.\end{aligned} \tag{2}$$

And

$$\begin{aligned}\text{Government Debt in the Next Year} = {} & (1 + \text{Interest Rate}) \times \text{Government Debt} \\ & + (1 - \text{Propensity to Consume}) \times (\text{GDP} - \text{Taxes} - \text{Investment}) \\ & - \text{Propensity to Consume} \times \text{Government Debt} \times \text{Interest Rate}.\end{aligned} \tag{3}$$

The following symbols will be used from here on.

Propensity to Consume	c	Consumption	C
Taxes	T	Investment	I
Interest Rate	r	Nominal Growth Rate	g
GDP	Y	Government Debt	B
GDP in the next year	Y'	Government Debt in the next year	B'

Dividing (3) by GDP in the next year, $Y' = (1+g)Y$, we have

$$\frac{B'}{Y'} = \left(\frac{1+r}{1+g}\right)\frac{B}{Y} + \left(\frac{1-c}{1+g}\right)\left(1 - \frac{T}{\mathrm{Y}} - \frac{I}{\mathrm{Y}}\right) - \left(\frac{cr}{1+g}\right)\frac{B}{Y}.$$

Further we get

$$\frac{B'}{Y'} - \frac{(1-c)\left(1-\frac{T}{Y}-\frac{I}{Y}\right)}{g-(1-c)r} = \frac{1+(1-c)r}{1+g}\left[\frac{B}{Y} - \frac{(1-c)\left(1-\frac{T}{Y}-\frac{I}{Y}\right)}{g-(1-c)r}\right].$$

For simplicity, we assume that $\frac{T}{Y}$, $\frac{I}{Y}$ are constant. This equation means that

$$\frac{B}{Y} - \frac{(1-c)\left(1-\frac{T}{\mathrm{GDP}}-\frac{I}{\mathrm{GDP}}\right)}{g-(1-c)r}$$

is a geometric sequence with the common ratio;

$$\frac{1+(1-c)r}{1+g}.$$

Its convergence condition is

$$\frac{1+(1-c)r}{1+g} < 1,$$

that is

$$g > (1-c)r. \tag{4}$$

The limit value of $\frac{B}{Y}$ when it converges is

$$\frac{(1-c)\left(1-\frac{T}{\mathrm{GDP}}-\frac{I}{\mathrm{GDP}}\right)}{g-(1-c)r}.$$

Condition (4) is considerably weaker than the Domar condition

$$g > r,$$

and it is likely to hold in many cases.

Dividing (1) by GDP yields

$$\frac{C}{Y} = c\left(1 - \frac{T}{Y} + \frac{B}{Y}r - \frac{I}{Y}\right).$$

If the Debt-to-GDP Ratio, $\frac{B}{Y}$, diverges, the left side becomes less than 1 while the right side becomes infinite. Since this is impossible, the Debt-to-GDP ratio cannot diverge.

From (2), the limit value of the Fiscal Deficit-to-GDP ratio excluding interest payment is

$$\frac{(g-r)(1-c)\left(1-\frac{T}{\text{GDP}}-\frac{I}{\text{GDP}}\right)}{g-(1-c)r}.$$

On the otherhand, the limit value of the Fiscal Deficit-to-GDP ratio including interest payment is

$$\frac{g(1-c)\left(1-\frac{T}{\text{GDP}}-\frac{I}{\text{GDP}}\right)}{g-(1-c)r}.$$

Concluding Remark

It appears that government spending will need to be cut to accommodate rising consumer demand; however, since this increase in consumption is expected to materialize gradually over time, it seems feasible to address the situation by combining spending cuts with tax increases. Furthermore, the debt-to-GDP ratio is likely to stabilize before reaching extreme levels such as 1,000%.

Supplement: A case with interest income tax

In the analysis so far, we have treated taxes as being levied on income other than interest income. Below, we will consider the case where taxes are also levied on interest income. Let t_r be an interest income tax rate. Then, (1) is rewritten as

$$\begin{aligned}\text{Consumption} = \text{Propensity to Consume} \times [&\text{GDP} - \text{Income Taxes} \\ &+ (1-t_r) \times \text{Government Debt} \times \text{Interest rate} - \text{Invetsment}],\end{aligned} \tag{5}$$

and (2) is rewritten as

$$\begin{aligned}\text{Fiscal Deficit} &= \text{Government Spending} - \text{Income Taxes} - \text{Interest Income Taxes} \\ &= \text{GDP} - \text{Consumption} - \text{Investment} - \text{Income Taxes} - \text{Interest Income Taxes} \\ &= (1 - \text{Propensity to Consume}) \times (\text{GDP} - \text{Income Taxes} - \text{Investnent}) \\ &\quad - \text{Propensity to Consume} \times (1-t_r) \times \text{Government Debt} \times \text{Interest Rate} \\ &\quad - t_r \times \text{Government Debt} \times \text{Interest Rate}\end{aligned} \tag{6}$$

And

$$\begin{aligned}\text{Government Debt in the Next Year} = {} & (1 + \text{Interest Rate}) \times \text{Government Debt} \\ &+ (1 - \text{Propensity to Consume}) \times (\text{GDP} - \text{Income Taxes} - \text{Investnent}) \\ &- \text{Propensity to Consume} \times (1-t_r) \times \text{Government Debt} \times \text{Interest Rate} \\ &- t_r \times \text{Government Debt} \times \text{Interest Rate}\end{aligned} \tag{7}$$

Let T be the income taxes. Dividing (7) by GDP in the next year, $Y' = (1+g)Y$, we have

$$\frac{B'}{Y'} = \left(\frac{1+r}{1+g}\right)\frac{B}{Y} + \left(\frac{1-c}{1+g}\right)\left(1 - \frac{T}{\mathrm{Y}} - \frac{I}{\mathrm{Y}}\right) - \left[\frac{cr(1-t_r)+t_r r}{1+g}\right]\frac{B}{Y}.$$

Further we get

$$\frac{B'}{Y'} - \frac{(1-c)\left(1-\frac{T}{Y}-\frac{I}{Y}\right)}{g-(1-c)(1-t_r)r} = \frac{1+(1-c)(1-t_r)r}{1+g}\left[\frac{B}{Y} - \frac{(1-c)\left(1-\frac{T}{Y}-\frac{I}{Y}\right)}{g-(1-c)(1-t_r)r}\right].$$

We assume that $\frac{T}{Y}$, $\frac{I}{Y}$ are constant. This equation means that

$$\frac{B}{Y} - \frac{(1-c)\left(1-\frac{T}{\mathrm{GDP}}-\frac{I}{\mathrm{GDP}}\right)}{g-(1-c)(1-t_r)r}$$

is a geometric sequence with the common ratio;

$$\frac{1+(1-c)(1-t_r)r}{1+g}.$$

Its convergence condition is

$$\frac{1+(1-c)(1-t_r)r}{1+g} < 1,$$

that is

$$g > (1-c)(1-t_r)r. \tag{8}$$

(8) is weaker than (4). The limit value of $\frac{B}{Y}$ when it converges is

$$\frac{(1-c)\left(1-\frac{T}{\mathrm{GDP}}-\frac{I}{\mathrm{GDP}}\right)}{g-(1-c)(1-t_r)r}.$$

From (6), the limit value of the Fiscal Deficit-to-GDP ratio excluding interest payment is

$$\frac{(g-r)(1-c)\left(1-\frac{T}{\mathrm{GDP}}-\frac{I}{\mathrm{GDP}}\right)}{g-(1-c)(1-t_r)r}.$$

On the otherhand, the limit value of the Fiscal Deficit-to-GDP ratio including interest payment is

$$\frac{g(1-c)\left(1-\frac{T}{\mathrm{GDP}}-\frac{I}{\mathrm{GDP}}\right)}{g-(1-c)(1-t_r)r}.$$

References

Yasuhito Tanaka. On the Non-Divergence Condition of the Debt-GDP Ratio Considering Consumption from Assets and Impossibility of Fiscal Collapse with Arguments about Important Misconceptions in Macroeconomics, *Financial Economics Letters*, vol. 4, pp. 37-47, 2025.

https://www.anserpress.org/journal/fel/4/1/43