

4. The public sector budget constraint

The intertemporal consumption theory provides a first insight about the link between the present and the future and the fallacy inherent in overlooking dynamic issues. Tomorrow's budget constraint depends on today's saving/dissaving. The present affects the future in so far as today's flows add to/subtract from tomorrow's assets. Viceversa, the future affects the present if agents are forward-looking.

Yet, our analysis up to now has overlooked one important intertemporal issue: the government budget constraint. Changes in taxes/expenditure today affect the dynamics of the stock of government debt, hence the future flows of taxes necessary to pay interest (and repay the principal) on the stock of debt.

Government solvency (finite time)

As for private agents, if the government has a finite lifetime, solvency implies that the government

cannot die with a positive outstanding stock of debt. The PDV of government expenditure (discounted at the interest rate at which the government can borrow/lend) cannot exceed the PDV of taxes.

Suppose the world lasts only two periods and no money printing.

$$B_1 = G_1 - T_1 \quad (1)$$

and

$$B_2 = G_2 - T_2 + (1 + r_g)B_1. \quad (2)$$

Solvency requires $B_2 \leq 0$, hence

$$G_1 + \frac{G_2}{1 + r_g} \leq T_1 + \frac{T_2}{1 + r_g}. \quad (3)$$

If the marginal utility of consumption is positive it makes sense to assume that (3) holds with equality.

Any change in taxes/expenditure has to satisfy the government budget constraint (3). If it does not the government will not repay its debt in full (is bankrupt) and rational agents will not lend to it \rightarrow

Russian debt crisis.

G_1 , G_2 , T_1 and T_2 cannot be all exogenous.

There cannot be permanent tax cuts without offsetting expenditure cuts. Temporary tax cuts financed by borrowing imply future higher future taxes.

Ricardian equivalence

Assume G_1 and G_2 are exogenous and so is r_g . This completely determines the PDV of taxes. Any debt-financed cut in taxes has to satisfy

$$\Delta T_1 + \frac{\Delta T_2}{1 + r_g} = 0. \quad (4)$$

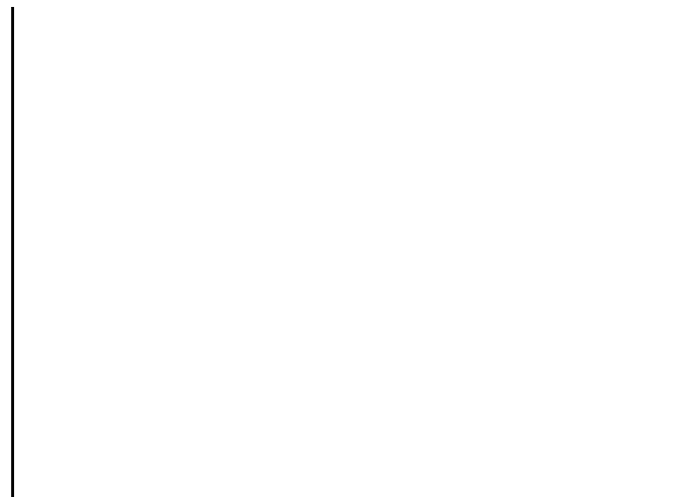
What is the effect of a debt-financed tax cut on private consumption? Private agents' intertemporal budget constraint becomes

$$C_1 + \frac{C_2}{1 + r} = Y_1 - T_1 - \Delta T_1 + \frac{Y_2 - T_2 + \Delta T_1(1 + r_g)}{1 + r} \quad (5)$$

If $r = r_g$ the individual budget constraint is unaffected.

Ricardian equivalence: government bonds do not constitute net wealth. Debt-financed tax cuts have no effect on private consumption.

The future tax increase necessary to repay interests plus principal on the additional debt issue has the same present value as the current tax cut if $r = r_g$.



Is Ricardian equivalence likely to hold in practice?

1. Imperfect capital markets. If $r \neq r_g$ the tax

change affects lifetime income. If realistically $r > r_g$ consumption increases.

An extreme case is when some individuals cannot borrow at all (effectively $r = \infty$). Consumption increases one-to-one with the fall in current taxes. The government is borrowing in place of private agents. Empirical studies find that between 15 and 20 per cent of individuals are borrowing-constrained (e.g. in the US and Japan).



2. Distortionary taxes. Distortionary taxes alter production/consumption decisions even if they leave the PDV of income unchanged.
3. The government has a longer horizon than private agents. Suppose the government lives three periods and repays interests plus principal in the last period ($\Delta T_3 = -\Delta T_1(1+r)^2$). The tax cut is a windfall gain for individuals alive at time 1 and a windfall loss for individuals alive at time 3 even if $r = r_g$.

Two objections: (a) if individuals with finite lifetimes “love their children” and leave positive bequests they may still behave as if infinitely-lived increasing bequests by the same amount as the PDV of the future tax increase; (b) more importantly, though, a very large proportion of the PDV of taxes associated with debt issues are levied within the life horizon of the individuals alive at the time the bonds were issued (Poterba and Sum-

mers [1987]).

4. Myopic behaviour. Agents may not optimize fully over long horizons.

Overall, Ricardian equivalence is unlikely to be an important issue in practice. Yet, it provides a useful theoretical baseline.

A second justification for budget deficits: consumption and tax smoothing

The intertemporal theory of consumption provides further insight on the role of government debts and deficits beyond that of limiting income fluctuations (automatic stabilization).

Ultimately, agents derive utility from consumption not from income per se. The fundamental intuition of the neoclassical consumption theory is that agents are likely to be better off if their consumption profile is smooth; i.e. if they can borrow when their current

income is below their permanent one and lend when the opposite is the case.

Let us take the path of government expenditure as given; i.e. we are abstracting from the question of whether the government should provide certain goods and services (This is a standard public economics question. The first-cut textbook answer is a qualified yes if public goods, externalities and the like).

The issue we want to consider is why should the government finance its expenditure partly by issuing debt rather than by balancing the budget continuously. Debt allows to spread the cost of big items of expenditure (e.g. wars, reconstruction after an earthquake, museums, etc.) across time. This is desirable for:

1. Intergenerational consumption smoothing. Some items of expenditure benefit also future generations. Borrowing allows the government to spread the cost of these projects across generations. Private intergenerational lending would not necessar-

ily work if parents cannot leave negative bequests.

2. Intragenerational consumption smoothing. If agents are liquidity constrained or if the government can borrow on better terms than private agents ($r > r_g$) then it is efficient to spread the tax burden over time or postpone taxes.
3. Tax smoothing. In practice taxes are distortionary (i.e. they are levied on just a subset of goods). Debt allows to spread the distortion over time (improve static efficiency) and to reduce the intertemporal distortion (improve dynamic efficiency).

Suppose taxes can be levied on leisure but not on consumption. The figure below shows the static distortion (leisure today vs consumption today) if the variable on the vertical axis is consumption today and the dynamic distortion if the variable on the vertical axis is leisure tomorrow.



The current government Code for Fiscal Stability states that “... *over the cycle the government will only borrow to invest...*” (H. M. Treasury [1997]).

The above analysis has shown that government borrowing should facilitate private consumption and tax smoothing in the face of fluctuating private income and government expenditure. This is the only “Golden Rule” of government borrowing.

On the issue the interested reader may consult <http://www.econ.cam.ac.uk/faculty/buiter/oup.pdf>.