1. Environment

The economy is populated by households and a government. They live for two periods, $t = 0$ and $t = 1$, and trade a homogeneous consumption good and public bonds. All trades are carried out through consumption goods. We do not model money.

The government demands (g_0, g_1) consumption goods (or g_0 in period zero and g_1 in period one). To finance itself, it charges *lump-sum* taxes (τ_0, τ_1) on households. It also issues public bonds, which promise the delivery of one unit of good in the following period. In period 0, the price of one bond is q_0 units of consumption good. In period 1, households have no incentive to save, and demand no bonds; hence, the equilibrium bond price is $q_1 = 0$.

We make two critical assumptions on government behavior. First, it can *credibly* commit to fully repay previously issued debt. Second, it always does so. "Credibly"means that households believe the government will not default, and demand public bonds accordingly.

The government inherits from the past a debt of b_{-1} bonds. In period zero, it must therefore come up with b_{-1} goods to pay bondholders. It can either sell new bonds b_0 and raise $q_0 b_0$ goods in revenue, or run a *primary surplus*. The primary surplus is defined as the difference between tax proceeds and non-interest spending. In this model, it correponds to the quantity $\tau_0 - g_0$. The government avoids a default in period zero if

$$q_0 b_0 + \tau_0 - g_0 = b_{-1}. \tag{1}$$

$$\tau_1 - g_1 = b_0 \tag{2}$$

To avoid a default in period zero, the government must either raise revenue from new bond issues $q_0 b_0$, or run a

There is a single consumption good, which households value. The utility function

$$u(c_0) + \beta u(c_1)$$

captures households' preferences over the amount consumed in period zero c_0 and period one c_1.

$$\begin{aligned} & \underset{c_0, c_1, b_0}{\text{Max}} \quad u(c_0) + \beta u(c_1) \\ \text{s.t.} \quad & q_0 b_0 + c_0 = b_{-1} + y_0 - \tau_0 && (3) \\ & c_1 = b_0 + y_1 - \tau_1 && (4) \\ & b_0 \geq \underline{b} && (5) \end{aligned}$$

We assume income (y_0, y_1) and initial wealth b_{-1} are large enough so that the household can choose non-negative amounts of goods.

We assume that $b_{-1} + y_0 - \tau_0 \geq 0$

$y_0 > \tau_0$, so income high enough to pay taxes.

$b_{-1} \geq 0$

$\underline{b}$ is the borrowing limit.