

Economics W4505

International Monetary Theory and Policy

Spring 2010

Homework 6

Due March 4th in class

An Economy With A Government

1. Lump-Sum Taxes

Consider a two-period endowment economy populated by a large number of identical households with preferences described by the following utility function

$$\sqrt{C_1} + \frac{1}{1.1}\sqrt{C_2},$$

where C_1 and C_2 denote consumption in periods 1 and 2, respectively. Households are endowed with 10 units of goods each periods and pay lump-sum taxes to the government in the amounts T_1 in period 1 and T_2 in period 2. Assume further that households are born with no financial assets or debts ($B_0^p = 0$) and can borrow or lend in the international financial market at the world interest rate $r^* = 0.1$. The government starts period 1 with no outstanding assets or liabilities ($B_0^g = 0$). In period 1, the government collects lump-sum taxes T_1 and consumes $G_1 = 1$ units of goods. In period 2, it collects lump-sum taxes T_2 and consumes $G_2 = 1$ units of goods. Like the household, the government has access to world financial markets. In answering the following questions, please show your work.

- (a) Compute the equilibrium levels of consumption, the trade balance, and the current account in periods 1 and 2.
- (b) Suppose that $T_1 = 0$. What is T_2 ? What is private, public, and national saving in periods 1 and 2?
- (c) Suppose now that T_1 increases from 0 to 1 while government purchases are unchanged in both periods. How does this tax hike affect the current account and the fiscal deficit in period 1? Briefly explain your result.
- (d) Suppose that in period 1 the government increases spending from 1 to 2 units of goods and at the same time increases T_1 to 2, so that the fiscal deficit in period 1 is nil. Government spending in period 2 is unchanged. What is the effect of this policy change on the current account in period 1? Provide a brief intuitive explanation.
- (e) Alternatively, suppose that there is a permanent increase in government purchases: both G_1 and G_2 increase by 1 unit. What is the response of the current account in period 1? Intuitively, compare your result with that from the previous question.

2. Proportional Consumption Tax

Consider a two-period, small, open, endowment economy. Assume that households' preferences are described by the following utility function

$$\ln(C_1) + \ln(C_2),$$

where C_1 and C_2 denote consumption in periods 1 and 2, respectively. Households are endowed with 10 units of goods in each period and pay proportional taxes on consumption. Let τ_1 and τ_2 denote the consumption tax rates in periods 1 and 2, respectively. Finally, households are born with no financial assets ($B_0^p = 0$) and can borrow or lend in the international financial market at the world interest rate $r^* = 0.1$.

The government starts period 1 with no outstanding assets or liabilities ($B_0^g = 0$). It taxes consumption at the same rate in both periods ($\tau_1 = \tau_2$) and consumes 1 unit of goods in each period. That is, $G_1 = G_2 = 1$, where G_1 and G_2 denote government consumption in periods 1 and 2, respectively. Like the household, the government has access to the world financial market. In answering the following questions, show your work.

- (a) Compute the equilibrium tax rate and the equilibrium levels of consumption, the trade balance, private savings, the primary and secondary fiscal deficits, and the current account in periods 1 and 2.
- (b) Suppose now that the government implements a stimulus package consisting in reducing the tax rate by half in period 1, with government consumption unchanged in both periods. How does this expansionary fiscal policy affect private consumption, the trade balance, the current account, and the primary and secondary fiscal deficits in period 1 and the tax rate in period 2? Briefly explain your result.