EC201 Macroeconomics 2, Term 1 2025
University of Warwick
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Support and Feedback Class 3(week 5)
Intertemporal Theory of the Current Account
Current Account Adjustment to Shocks

Pre-Class Review Questions Solutions

A. Pre-class Review Questions These review questions are designed to help you reflect on the lecture material and check your understanding. You must complete them before the support and feedback class. At the start of the class, you will need to show your answers to your tutor, who will record both your attendance and preparation. If you have any doubts about the questions, you can ask your tutor at the beginning of the session. Please note that review questions will not be discussed in detail during the class; however, brief answers will be posted on Moodle before the test and exam.

1. **News Shocks: Indicate weather the following statement is true, false or uncertain. Explain your reasoning.** ***Good news about future productivity leads to a trade deficit today.***

   The statement is uncertain. In a small open economy with production, the trade balance is

   $$TB_1 = Q_1 - C_1 - I_1.$$

   News about future productivity leave output unchanged because Q_1 depends on investment in the previous period, I_0, which is predetermined. Investment rises because the investment schedule $I_1 = I(r_1, A_2)$ in increasing in both arguments. Consumption rises as well, due to income effects caused by the jump in future profits $\Pi_2 = A_2 F(I_1) - (1 + r_1) D_1^f$ (see the discussion of technological improvements in the textbook). Whether this leads to a trade deficit or not depends on the initial level of output Q_1 and on the size of the jump in C_1 and I_1.

2. **Debt Forgiveness: Consider a small open economy where households live for two periods and have logarithmic preferences,**

   $$\ln C_1 + \beta \ln C_2,$$

   where the subjective discount factor β equals $\frac{10}{11}$. Suppose that households receive a constant endowment over time equal to 10, $Q_1 = Q_2 = 10$. Suppose that households start period 1 with debt including interest equal to 5, $(1 + r_0)B_0 = -5$ and that $r_0 = 0.1$. Finally, assume that the country enjoys free capital mobility and that the world interest rate is 10 percent, $r^* = 0.1$.

   a) **Calculate the equilibrium values of consumption, the trade balance, and the current account in period 1.**

      The household's budget constraint is derived from the two budget constraints, one in period 1 and the other in period 2 as in the lectures. Combine them to obtain the lifetime utility function:

      $$C_1 + \frac{C_2}{1 + r^*} = Q_1 + \frac{Q_2}{1 + r^*} + B_0(1 + r_0) \tag{1}$$

Substituting values given above:

$$C_1 + \frac{C_2}{1.1} = 10 + \frac{10}{1.1} - 5$$
$$C_1 + \frac{C_2}{1.1} = 14.09$$

Households maximize their utility function. The optimal condition which we derived in lectures is Euler equation which has to hold. In this case, we get a familiar expression: $C_2 = \beta(1 + r^*)C_1$. This is because now marginal utility of the logarithmic function $U'(C_1) = 1/C_1$

Substituting $\beta = \frac{10}{11}$ and $r^* = 0.1$:

$$C_2 = \frac{10}{11} \times 1.1 \times C_1 = C_1 \tag{2}$$

The households want to smooth consumption: $C_1 = C_2$. This is the characteristic of the utility function – there is an example in the book in Chapter 3.

Substituting $C_1 = C_2$ into the budget constraint it is straightforward to find the value of C_1 and C_2

$$C_1 + \frac{C_1}{1.1} = 14.09$$
$$C_1 = C_2 = 7.37$$

Trade balance is the difference between the endowment and consumption in the first period: $TB_1 = Q_1 - C_1 = 10 - 7.37 = 2.63$

The current account equals the trade balance minus net interest payments on initial debt. We are given the value of $(1 + r_0)B_0 = -5$. We also know what is the initial interest rate, $r_0 = 0.1$, so we can infer what is r_0B_0. In particular, $B_0 = -4.54$ and r_0B_0 is then equal to -0.45

$$\begin{aligned} CA_1 &= TB_1 + r_0B_0 \\ &= 2.63 - 0.45 \\ &= 2.18 \end{aligned}$$

b) **Suppose now that foreign lenders decide to forgive all of the country's initial external debt including interest. Calculate the effect of this external gift on consumption, the trade balance, and the current account in period 1. Provide an intuitive explanation of your findings.**

If foreign lenders forgive the debt (the -5 including interest), then effectively $B_0 = 0$. Substitute this into the budget constraint as above to get

$$C_1 + \frac{C_2}{1.1} = 10 + \frac{10}{1.1} + 0$$
$$C_1 + \frac{C_2}{1.1} = 19.091$$

With $C_1 = C_2$ as before, but with new values we obtain C_1 and C_2 being equal to 10.

Trade balance: $TB_1 = Q_1 - C_1 = 10 - 10 = 0$

Current Account in period 1: $CA_1 = 0$ because now $r_0 B_0 = 0$

Intuition: Wihout forgiveness, the country must run a current account surplus to service its debt. Households consume less than their endowment in period 1 to build assets and smooth consumption across periods. The debt burden forces them to transfer resources abroad.

On the other hand, with the forgiveness the debt burden is lifted, and households are relatively wealthier than in the scenarion under a). The household achieves perfect consumption smoothing at $C_1 = C_2 = Q_1 = Q_2 = 10$, with no need to run trade surpluses.

The debt forgiveness acts as a positive wealth shock worth 5 units in present value. This wealth increase is spread across both periods to maintain consumption smoothing. The change in consumption is:

$$\Delta C_1 = \Delta C_2 = 10 - 7.37 = 2.63$$

The total increase in lifetime consumption (in present value terms) equals the debt forgiven:

$$\Delta C_1 + \frac{\Delta C_2}{1 + r^*} = 2.63 + \frac{2.63}{1.1} = 5$$

This example demonstrates how debt relief directly improves household welfare by removing the obligation to transfer resources abroad, allowing consumption to rise to the level of the endowment.