

Homework Assignment #1: Answer sheet

1. Consider the economy of Macronesia (which is small despite its name). Here people have access to world capital markets but under current circumstances they choose neither to borrow or lend. In a two-period diagram draw production opportunities and indifference curves for Macronesia, and draw the world interest rate. Label the consumption point as A.

brief answer the production possibilities curve and the indifference curve are tangent to each other and the budget line with the slope $1 + \hat{r}$ where \hat{r} is the world interest rate (see figure 1):

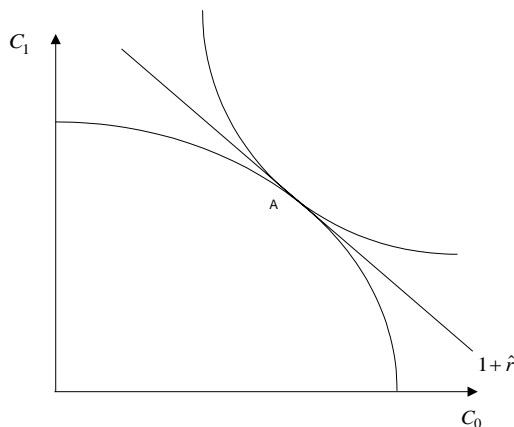


Figure 1:

2. (a) Imagine that a great natural disaster occurs which will greatly reduce current income, but leave future income unchanged in Macronesia. How does the production opportunities set shift? What would happen to consumption if Macronesia did not have access to world capital markets? Label this consumption point B.

brief answer Current consumption opportunities are reduced. The new frontier lays inside the old one as in figure 2. The new autarky consumption point is B.

- (b) What happens to the autarky rate of interest in Macronesia? Explain.

brief answer The autarky rate rises because there is less current production. Under autarky interest rates must rise to balance savings and investment domestically.

- (c) If Macronesia has access to the world capital markets what happens to production and consumption? Explain. Label the new consumption point C.

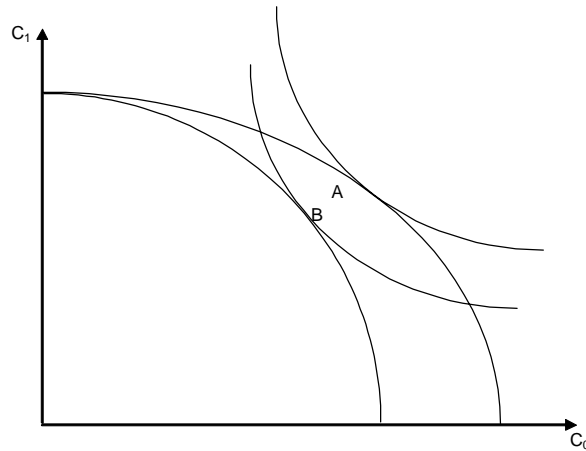


Figure 2: A Natural Disaster

brief answer With open capital markets Macronesia can finance current consumption out of future production. Since Macronesia is small the interest rate is unchanged, so the budget line is parallel to the one tangent to point A . The production point moves towards the northwest to point D , but the consumption point is at C . See figure 3. Citizens are better off at point C than at point B , but clearly they are worse off than at point A , because they have experienced a natural disaster.

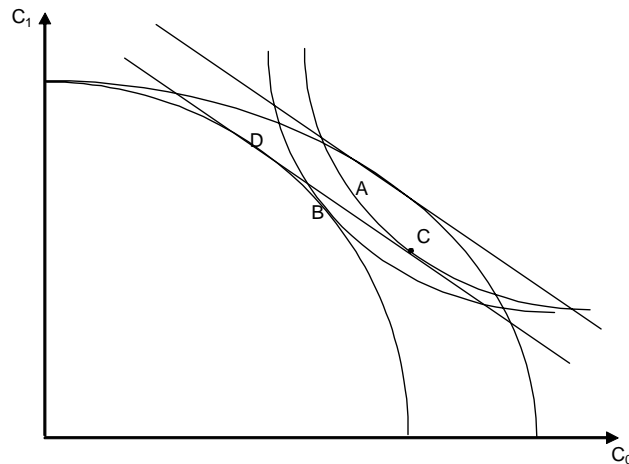


Figure 3: Disaster with open capital markets

(d) *Suppose Macronesia was a large economy. What would happen to the world interest rate given this natural disaster?*

brief answer If the economy were large the world interest rate would have to rise. The disaster would reduce world savings at the old interest rate. See figure 4 which is relevant here.

3. *Use the two-country model of savings and investment to examine the impact on the world*

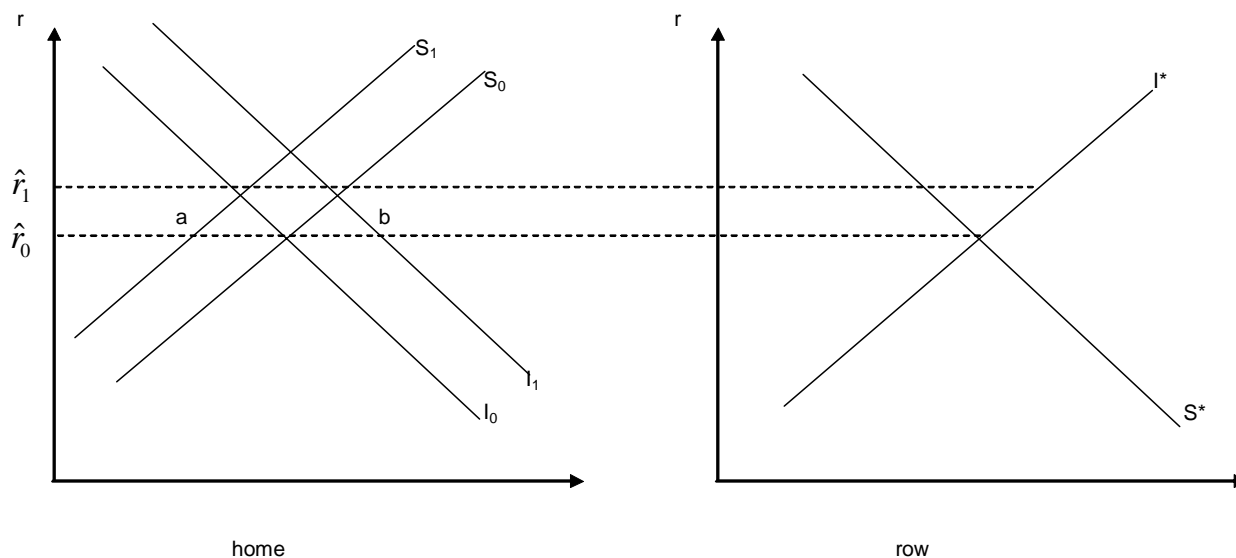


Figure 4: The Two-Country Model

interest rate of a natural disaster that affects the home country. What will happen to interest rates, savings and investment (in both countries) in the current period? Explain.

brief answer Initially the world interest rate is \hat{r}_0 , and the current account is balanced in both countries (just an assumption to make the picture simple). The disaster causes home savings to fall to S_1 . Moreover, investment rises to I_1 because there is a need to rebuild. If world interest rates were unchanged the current account deficit in the home country would be ab . But this cannot be an equilibrium because there would be a world current account deficit. So the world interest rate must rise, raising domestic and foreign savings and reducing investment. At \hat{r}_1 the current account surplus in the rest of the world offsets the current account deficit in the home country.

4. Use the dynamic model to examine the impact of recovery from a natural disaster, like a big flood. Suppose that an industrialized country loses half of its capital stock in a flood (but, obviously, not its know-how). Examine what happens to the capital labor ratio, initially and over time, if the economy is closed. Compare this to what happens if the economy were open. In which case is the recovery faster? Why? Explain.

brief answer The steady state capital-labor ratio is \bar{k} . The disaster destroys capital so we are at k_1 . As the economic potential is unaffected the transition curve is unmoved. Capital accumulation causes the economy to recover as in figure 5. If the economy were open then capital could flow in from abroad in the wake of the disaster. The recovery would be quicker. At k_1 the marginal product of capital is higher than in the rest of the world, attracting capital. If the economy is small, then sufficient capital could flow in right away. If not, then the adjustment would still take some time, but less than in the case of autarky.

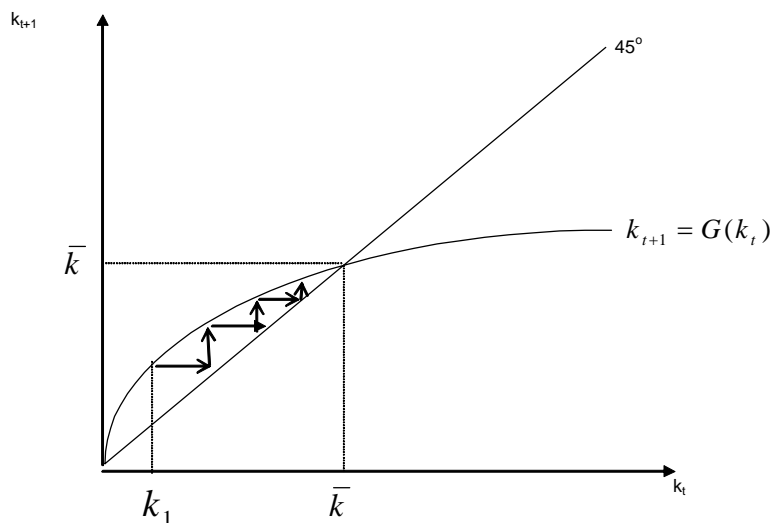


Figure 5: Recovery from disaster

5. Explain what happens to the current account balance (does it go up, go down, or is it unchanged, and explain why) if:

(a) A local auto dealer imports a \$30,000 automobile.

brief answer Higher imports means the trade balance, and thus the current account balance, falls.

(b) A student from China comes to PSU to study (supported by her parents).

brief answer The current account improves. The transfer from her parents improves the net transfer balance which is part of the current account.

(c) A family receives \$1000 interest payment on a bond issued by a foreign government.

brief answer Higher interest income improves the current account.

(d) The US government gives \$100 million in aid to a drought-stricken country.

brief answer This causes the net transfer balance to fall, so the current account deteriorates.

(e) An investor trades sells \$2 million for pounds at the current exchange rate of \$1.842.

brief answer Nothing happens. The investor trades dollars for pounds, but there is no change in any item in the current account. There is no change in the volume of assets, just the composition.

(f) The world price of oil rises by 20%.

brief answer Since the US is a net importer of gasoline, the trade balance would deteriorate, and the current account balance would fall. If we were Saudi Arabia, Norway, or Russia, the answer would be opposite.