

Problemset 11

International Macroeconomics (Master)

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Exercise 1: Market Completeness and Risk Sharing

Consider the same setting as in Problemset 10.

- (a) Consider now the following numerical example: $\mathcal{S} = 2$, $\rho = 1$, $\beta = 0.9$, $\pi(1) = \pi(2) = 1/2$, $Y_1 = Y_1^* = 1$, $Y_2(1) = Y_2^*(1) = 1$, $Y_2(2) = 3/2$, and $Y_2^*(2) = 1/2$.
- (i) Calculate state prices $p(1)$ and $p(2)$. Interpret your findings.
 - (ii) Calculate the equilibrium risk-free interest rate r .
 - (iii) Recall the current account equation, which we have derived in Problemset 10:

$$CA_1 = \frac{\beta}{1+\beta}Y_1 - \frac{1}{1+\beta} \left[\frac{p(1)Y_2(1) + p(2)Y_2(2)}{1+r} \right].$$

Show that the Home country is a creditor to the rest of the world in period 1. Explain why.

- (iv) Calculate consumption in every period and in each state of nature for the Home and Foreign countries.
 - (v) Calculate the prices of Arrow-Debreu securities and the covariance terms implied by the basic pricing equation.
 - (vi) Finally, calculate each country's optimal portfolio consisting of the individual Arrow-Debreu securities. Interpret your findings.
- (b) Redo exercise (a) for the following numerical example: $\mathcal{S} = 2$, $\rho = 1$, $\beta = 0.9$, $\pi(1) = \pi(2) = 1/2$, $Y_1 = Y_1^* = 1$, $Y_2(1) = 1/2$, $Y_2^*(1) = 1$, $Y_2(2) = 2$, and $Y_2^*(2) = 1/2$. What conclusion can you draw? Explain carefully.