

Economics W4505  
**International Monetary Theory and Policy**  
Spring 2010  
Homework 3  
Due February 11 in class

**1. The Terms of Trade and the Current Account**

Consider the following chart showing commodity prices in world markets:

Commodity	Price	
	Period 1	Period2
Wheat	1	1
Oil	1	2

In the table, prices of oil are expressed in dollars per barrel, prices of wheat are expressed in dollars per bushel. Kuwait is a two-period economy that produces oil and consumes wheat. Consumers have preferences described by the lifetime utility function

$$U(C_1, C_2) = C_1 \times C_2,$$

where  $C_1$  and  $C_2$  denote, respectively, consumption of wheat in periods 1 and 2, measured in bushels. Kuwait's per-capita endowments of oil are 5 barrels in each period. The country starts period 1 with net financial assets carried over from period 0, including interest of 10 percent, worth 1.1 bushels of wheat (i.e.,  $(1 + r_0)B_0^* = 1.1$ ). The interest rate in period 0 is assumed to be 10 percent (i.e.,  $r_0 = 0.1$ ). The country enjoys free capital mobility and the world interest rate is 10 percent. Financial assets are denominated in units of wheat.

- What are the terms of trade faced by Kuwait in periods 1 and 2?
- Calculate consumption, the trade balance, the current account and national savings in periods 1 and 2.
- Answer the previous question assuming that the price of oil in the second period is not 2 but 1 dollar per barrel. Compare your answers to this and the previous question and provide intuition.

**2. The Current Account As Insurance Against Catastrophic Events**

Consider a two-period endowment economy populated by identical households with preferences defined over consumption in period 1,  $C_1$  and consumption in period 2,  $C_2$ , and described by the utility function

$$\ln C_1 + E \ln C_2,$$

where  $C_1$  denotes consumption in period 1,  $C_2$  denotes consumption in period 2, and  $E$  denotes the expected value operator. Each period, the economy receives an endowment of 10 units of food. Households start period 1 carrying no assets or debts from the past. The interest rate on financial assets held between periods 1 and 2 is zero.

- (a) Compute consumption, the trade balance, the current account, and national savings in period 1.
- (b) Assume now that the endowment in period 1 continues to be 10, but that the economy is prone to severe natural disasters in period 2. Suppose that these negative events are very rare, but have catastrophic effects on the country's output. Specifically, assume that with probability 0.01 the economy suffers an earthquake in period 2 that causes the endowment to drop by 90 percent with respect to period 1. With probability 0.99, the endowment in period 2 increases to 111/11.
  - i. What is the expected endowment in period 2? How does it compare to that of period 1?
  - ii. What percent of period-1 endowment will the country export? Compare this answer to what happens under certainty and provide intuition.