

MACROECONOMIC RISK AND INTERNATIONAL FINANCE

HOMEWORK ASSIGNMENT #3

Purchasing Power Parity, Product Market, Trade Balance, Fixed Exchange Rates

1. (24 points in total, 8 points each) Below are the monthly costs of several common goods purchased by students in Washington, D.C. and Tokyo, Japan in 2005 (those were the days!):

Commodity	Price in D.C. (in \$)	Price in Tokyo (in yen)
Food, 1 month's supply	160	24,800
Rent, shared house	650	120,000
Entertainment	60	9,200
Clothing	50	7,900
Health Insurance	40	6,600

Questions:

- A. Based solely on the purchasing-power-parity (PPP) theory of exchange rates, what should be the \$/yen exchange rate? (Hint: Construct a consumer price index for each country, by taking a weighted average of the individual commodity prices. Use the shares of each commodity in total expenditure as the basis for the weights in the weighted average you construct. Then apply the PPP relation.)
- Q. how to build CPI without knowing base year and
- B. Given the PPP exchange rate you derived in (A), how close is the law of one price to holding for each of the individual commodities (at the PPP exchange rate)? Show calculations of the law of one price using your exchange rate in (A).
- C. Suppose the actual market exchange rate was .00645 \$/yen (or, 155 yen/\$). This exchange rate *does not* align with the exchange rate predicted by PPP. In the data above, what price(s) is mainly behind the breakdown in purchasing power parity at this market exchange rate?

2. (24 points in total, 6 points each) Suppose that the U.S. consumption function took the form

$$C = 231 + .78Y$$

where Y is in billions of dollars (\$B) per annum. Suppose further that imports, as a function of real income Y took the form

$$IM = 44 + .13Y$$

Suppose further that investment $I = 204$, exports $EX = 53$, and $G = 108$.

Questions:

- A. Using the equilibrium relationship $Y = C + I + G + CA$, can you calculate algebraically the exact equilibrium level of real income Y ?
- B. Illustrate the resulting aggregate demand curve AD and the aggregate supply curve AS in a “Keynesian Cross” diagram.
- C. Suppose government spending G were to rise exogenously by the amount \$1B. Illustrate diagrammatically the effect of this and establish the numerical value of the increase in equilibrium real income (Note: The value by which income increases relative to an initial increase of \$1 worth of additional spending of any kind is the so-called “GDP expenditure multiplier”. If the functions C , I , G , and CA are linear, then this multiplier is a constant number).
- D. Suppose exports EX were to rise exogenously by the amount \$1B. The trade balance CA is of course equal to $EX - IM$. In equilibrium does the trade balance CA also rise by the exact amount that exports EX did? Explain carefully why or why not.
3. (24 points in total, 8 points each) Suppose that in Problem 2 above, exports and imports were given instead by:

$$EX = 50 + 0.3(EP^*/P)$$

$$IM = 48 - 0.4(EP^*/P) + .13Y$$

where, initially, $P^* = 0.1$, $P = 1$, and $E = 100$.

Questions:

- A. Derive the analytical expression for the trade balance CA in terms of the real exchange rate (EP^*/P) and Y . (For now do not substitute in the initial values of E , P^* , or P .)

For the remaining questions, assume that $P^* = 0.1$ and $P = 1$.

- B. At the values $E = 100$, $Y = 1577$ is the product market in equilibrium?
- C. Suppose the exchange rate E were to go up to 114. What would be the new level of equilibrium Y corresponding to this value of E ? What therefore does depreciation do to economic activity?
4. (28 points in total) A *speculative attack* on a currency begins when investors suddenly shift their expectations and now expect a larger depreciation than was previously the case. Without any additional central bank action, this shift in expectations will have the result of producing an actual currency depreciation. Using your knowledge of the Asset Markets Model of exchange rates *under fixed exchange rates*:
- (a) (12 points) Illustrate how this expectations-led speculative attack creates pressure on the domestic currency to depreciate.
- (b) (8 points) In a separate diagram, explain why some economists might recommend that the central bank facing such a problem adopt a policy of monetary contraction.
- (c) (8 points) What role might the central bank's foreign exchange reserves play in support of this policy?