International Balance of Payments – Homework 1

Name___________________________________

Part I: National Income Accounting and Balance of Payments Accounts

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The United States began to report its gross domestic product (GDP) only since
   A) 1900    B) 1921    C) 1931    D) 1941    E) 1991

2) In the United States over the past fifty years, the fraction of GNP devoted to consumption has fluctuated in a range of about
   A) 22 to 29 percent.
   B) 32 to 39 percent.
   C) 62 to 70 percent.
   D) 42 to 49 percent.
   E) 82 to 89 percent.

3) Which one of the following statements is false?
   A) The United States had accumulated substantial foreign wealth by the early 1980s
   B) U.S. foreign debt has continued to grow and now stands at 25 percent of GNP.
   C) The 1980s witnessed a sustained current account deficit of proportions unprecedented in the twentieth century opened up.
   D) The U.S. foreign debt was paid off in the 1990s, allowing the U.S. to attain a current account surplus. However, the deficit has returned in recent years.
   E) In 1987, the country became a net debtor to foreigners for the first time since World War I.

4) In open economies,
   A) Saving and investment are not necessarily equal as they are in a closed economy.
   B) Saving and investment are necessarily equal contrary to the case of a closed economy.
   C) Saving and investment are necessarily equal.
   D) As in a closed economy, saving and investment are not necessarily equal.
   E) None of the above.
5) Ricardian equivalence argues that when the government cuts taxes and raises its deficit,
   A) consumers anticipate that they will face lower taxes later to pay for the resulting government debt.
   B) consumers anticipate that they will face higher taxes later to pay for the resulting government debt.
   C) consumers anticipate it will affect their future taxes, in general in the direction of lowering future taxes.
   D) consumers anticipate that they will higher services from the government.
   E) None of the above.

6) GDP is different than GNP in that
   A) it does not account for indirect business taxes
   B) it accounts for net unilateral transfers
   C) it does not account for a country's production using services with foreign-owned capital
   D) it accounts for depreciation
   E) None of the above.

7) The services British capital provides in Spain are a service export from Britain,
   A) Is added to Spanish GDP to calculate Spanish GDP
   B) Is subtracted from British GDP to calculate British GNP
   C) Is added to British GDP to calculate British GNP
   D) Only A and B.
   E) None of the above.

8) Any goods
   A) and services purchased by federal, state, or local governments are classified as government purchases.
   B) purchased by federal, state, or local governments are classified as government purchases.
   C) and services purchased only by federal government are classified as government purchases.
   D) and services purchased only by federal or state governments are classified as government purchases.
   E) None of the above.

9) Government purchases currently take up about
   A) 38 percent of U.S. GNP, and this share has not changed much since the late 1950s.
   B) 18 percent of U.S. GNP, and this share has been decreasing since the late 1950s.
   C) 19 percent of U.S. GNP, and this share has not changed much since the late 1950s.
   D) 18 percent of U.S. GNP, and this share has been increasing since the late 1950s.
   E) None of the above.
10) In a closed economy, private saving, \( S^P \), is equal to

A) \( I - (G - T) \)
B) \( I + (G - T) \)
C) \( I - (G + T) \)
D) \( I + (G + T) \)
E) \( I + (G - T) + C \)

11) In an open economy, private saving, \( S^P \), is equal to

A) \( I + CA + (G + T) \)
B) \( I - CA + (G - T) \)
C) \( I + CA + (G - T) \)
D) \( I + CA - (G - T) \)
E) \( I - CA - (G - T) \)

12) An American buys a Japanese car, paying by writing a check on an account with a bank in New York. How would this be accounted for in the balance of payments?

A) Current account, a Japanese good import
B) Current account, a U.S. good import
C) Financial account, a U.S. asset import
D) Financial account, a U.S. asset export
E) Only B and D.

13) Movements in GDP

A) and GNP usually do not differ greatly.
B) are usually smaller than those of GNP movements, in practice.
C) and GNP usually do not differ greatly, as a practical matter.
D) and GNP usually do differ greatly.
E) None of the above.

14) You travel to Paris and pay for a $100 dinner with your credit card. How is this accounted for in the balance of payments?

A) Current account, French service import
B) Financial account, U.S. asset import
C) Current account, U.S. good export
D) Financial account, U.S. asset export
E) None of the above.
15) In a closed economy, national saving
   A) is always more than investment.
   B) is always less than investment.
   C) always equals investment.
   D) sometimes equals investment.
   E) None of the above.

16) When economists refer to the word government, they usually mean
   A) Only the federal and local governments
   B) Only the federal government
   C) Only the federal and state governments
   D) The federal, state, and local governments
   E) None of the above.

17) For open economies,
   A) \( S = I + CA \)
   B) \( S < I + CA \)
   C) \( S = I - CA \)
   D) \( S > I + CA \)
   E) \( S = I \)

18) Investment is usually
   A) less variable than consumption.
   B) as variable as consumption.
   C) more variable than consumption.
   D) It is hard to tell from the data whether investment is more or less variable than consumption.
   E) None of the above.

19) A U.S. citizen buys a newly issued share of stock in England, paying for his order with a check, which the British company deposits in its own U.S. bank account in New York. How is this transaction accounted for in the balance of payments?
   A) Financial account, U.S. asset import
   B) Current account, British good export
   C) Financial account, U.S. asset export
   D) Financial account, British asset import
   E) Current account, U.S. service import
20) Which one of the following expressions is the most accurate?

A) CA = EX - IM
B) CA = EX = IM
C) CA = EX + IM
D) CA = IM - EX
E) None of the above.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

21) Assume
C = 40 + 0.8(Y - T)
G = 10
I = 20
T = 0, where T are taxes.
(a) Calculate Y at equilibrium.
(b) Calculate C, I, and G at equilibrium.
(c) Now assume,
EX = 5 + 4E/P
IM = 10 + 0.1(Y - T) - 3E/P
E = 3
P* = 1.5
P = 2
Find equilibrium Y

22) What can one learn from Figure 12–3 (page 301) of Krugman–Obstfeld?

23) Consider how the United States balance of payments accounts are affected when U.S. banks forgive two billion in debt owed to them by the government of Argentina.
Part II: The Current Account in an Endowment Economy

Consider the following two period model of a small open economy without production or investment. There is only one good in each period, which cannot be stored. The economy has a representative household that is endowed with $Q_1 = 5$ units of the good in period 1 and $Q_2 = 10.2$ units in period 2. The world interest rate is constant and equal to $r^* = 0.1$ (i.e. ten percent) per period. The typical household has initial net foreign wealth of $(1 + r^*)B_0 = 1$.

Finally, the preferences of the representative household are described by the utility function:

$$U(C_1, C_2) = \sqrt{C_1} + \beta \sqrt{C_2}$$

where $\beta = 1/1.1$ ($\beta$ is called the subjective discount factor). Notice that the marginal utility of consumption in period 1 is then $1/2\sqrt{C_1}$ and the the marginal utility of consumption in period 2 is then $\beta/2\sqrt{C_2}$ (why?)

For questions 1 to 4, assume that there is free capital mobility. *Hints:* Write the present value budget constraint. Also, what is the key condition for optimal consumption?

1. The equilibrium level of consumption in period 1, $C_1$, equals:
   (a) 8
   (b) 7.6
   (c) 5
   (d) There is not enough information to determine $C_1$.

2. The equilibrium level of consumption in period 2 equals:
   (a) 8
   (b) 7.6
   (c) 10.2
   (d) 0

3. The *trade balance* in period 1:
   (a) is in deficit by 2.6 units.
   (b) is in deficit by 3 units.
   (c) is in deficit by 5.2 units.
   (d) is in surplus by 5.2 units.

4. Which one of the following statements is true of the *current account* in period 1?
   (a) It must be equal to the trade balance.
   (b) In period 1 there is a current account deficit and is larger than the trade deficit.
   (c) In period 1 there is a current account deficit but it is smaller than the trade deficit.
   (d) In period 1 there is a current account surplus that is larger than the trade surplus.
For questions 5-8, assume that the government imposes capital controls that prohibit borrowing from abroad ($B^*_1 \geq 0$).

5. With the capital controls, consumption in period 1 equals:
   (a) 7.6
   (b) 8
   (c) 5
   (d) 6

6. With the capital controls, consumption in period 2 equals:
   (a) 10.2
   (b) 11
   (c) 9
   (d) None of the above

7. With capital controls, the *domestic* interest rate must be approximately equal to:
   (a) 0.43
   (b) 0.66
   (c) 0.25
   (d) 0.1

8. The imposition of capital controls reduces the value of $U$ by approximately:
   (a) 1 unit of utility
   (b) 0.6 units of utility
   (c) 0.05 units of utility
   (d) It raises the value of $U$.

For questions 9-10 assume free capital mobility again, but now suppose that the household’s endowment in period 1 increases to $Q_1 = 9.2$, with the period 2 endowment unchanged.

9. Consumption in period 1 must now equal:
   (a) 9.2
   (b) 6
   (c) 8
   (d) 10.2

10. Which one of the following statements is false?
    (a) In period 1, the trade balance is now in deficit.
    (b) In period 1, the current account is zero.
    (c) Capital controls in period 1 would not be binding (i.e. affect equilibrium behavior).
    (d) $B^*_1$ must be zero.
Part III: An Economy With Investment

Consider a two period model of a small open economy with a single good each period. The representative household’s preferences are given by the utility function

\[ \log(C_1) + \log(C_2) \]

where \( C_t \) denotes consumption in period \( t = 1, 2 \), and \( \log \) denotes natural logarithm.

In period 1, the household receives an endowment of goods equal to \( Q_1 = 10 \).

In period 2, the household receives profits, denoted by \( \Pi_2 \), from the firms it owns. Households and firms have access to financial markets where they can borrow or lend at the interest rate of \( r_1 \). (i.e. \( r_1 \) is the interest rate on assets held between periods 1 and 2.)

Firms have zero initial wealth in period 1. However, they can borrow funds in period 1 to finance investment, which becomes capital in period 2. That is,

\[ K_2 = \text{capital in period } 2 = I_1 = \text{investment in period } 1 \]

The production function in period 2 is

\[ Q_2 = F(K_2) = \sqrt{K_2} \]

where \( Q_2 \) is output in period 2. Capital depreciates completely in production (i.e. \( \delta = 1 \)).

Assume that there is free international capital mobility and that the world interest rate is equal to \( r^* = 0.1 \). Hence \( r_1 = r^* = 0.1 \). Finally, assume that households have zero initial wealth (\( B^*_0 = 0 \)).

1. The firm’s optimal investment and choice of capital \( K_2 \) is given by the equality of \((1 + r^*)\) and:
   (a) \( F(K_2) \)
   (b) The average product of capital in period 2
   (c) The marginal product of capital in period 2
   (d) One cannot tell.

2. The firm’s optimal level of investment \( I_1 \) is approximately equal to:
   (a) 0.21
   (b) 1
   (c) 0.45
   (d) 2.12
   (Hint: The firm’s profit must be \( \Pi_2 = \sqrt{K_2} - (1 + r^*)I_1 \). Why?)

3. The typical firm’s profits in period 2, \( \Pi_2 \), must then (approximately) equal:
   (a) 0.23
   (b) 0
   (c) 1.12
4. The representative household’s consumption in period 1 is equal to:
   (a) 5
   (b) 12.12
   (c) 10
   (d) 5.10

5. The representative household’s consumption in period 2 is equal to:
   (a) 5
   (b) 12.12
   (c) 10
   (d) 5.61

6. The current account in period 1 is equal to:
   (a) 0
   (b) 4.67
   (c) 5
   (d) - 1.1

**Short Answer**

In the above model, consider an *investment surge*. Specifically suppose that, as a result of technological improvement, the production function changes to

\[ Q_2 = 2\sqrt{K_2} \]

7. Find the equilibrium levels of savings, investment, and the current account in period 1. Compare the results with those obtained in the previous case and provide interpretation and intuition.