

B.Sc. International Business and Politics
International Economics
Copenhagen Business School

Final Exam
October 19, 2009

Note: Your grade depends not just on the right answer but on the quality of the explanation and illustrations you provide. Write as clearly as possible, but keep it concise and to the point. When you draw diagrams, make sure they are also clearly labeled.

Problem 1 (Total points 20, 4 points each)

Assess whether the following statements are true or false, and explain briefly why.

- a) The US is more productive than Thailand in producing both computers and corn, so there is nothing to be gained from international trade between the two countries.

Answer: False. According to the theory of comparative advantage, even the US has absolute advantage in producing both computers and corn, the labor productivity in these two productions can be different, which leaves room for gains from international trade. The US will specialize in producing the thing where it has relatively higher productivity.

- b) Export subsidy helps countries to improve their term of trade, or TOT.

Answer: False. Export subsidy will unambiguously make a country's TOT deteriorate.

- c) The interest rate in the US is 5%, and the interest rate in Japan is 0.5%; the current spot exchange rate between US and Japan is 0.01 \$ per Yen and the expected exchange rate will be 0.012 \$ per Yen in one year. According to the information provided above, investors will be able to make profits within one-year time horizon if they borrow Yen and invest in US \$. (Note: it's safe to assume the interest rates will stay unchanged during the timeframe.)

Answer: False. First convert the given exchange rates using the US dollar as base currency. This gives you spot exchange rate: $1/0.01=100$ yen/\$; and expected exchange rate: $1/0.012=83.3$ yen/\$. In other words, within one year, the Japanese Yen will appreciate 16.7%, which is much bigger than the interest rate differential: $5\%-0.5\%=4.5\%$. Investor engaging in this carry trade will lose money.

- d) The reason that prices in developing countries are generally lower than developed countries is the labor productivity in developing countries is much lower in both tradable and non-tradable sectors.

Answer: False. In some non-tradable sectors, such as entertainment or haircut, there is not much difference in labor productivity between developed and developing countries. Two plausible explanations: one is Balassa-Samuelson effect and the other is difference in capital intensity (see discussions in Krugman and Obstfeld, 8e, pp. 399-401).

- e) Holding investment and government spending constant, a current account surplus simply means a country produces more than it consumes; a current account deficit simply means a country consumes more than it produces. .

Answer: True. $CA = Y - (C + I + G)$. When I and G are constant, $CA > 0$, if $Y > C$; $CA < 0$ if $Y < C$.

Problem 2 (Total points 30)

- a) Uncovered interest parity (UIP) condition is written as $R = R^* + (E^e - E) / E$. Explain intuitively what it means and why you expect it to hold, or not hold. (5 points)

Answer: The uncovered interest parity condition states that there will be no arbitrage opportunities between two currencies if the interest differential is just enough to be offset by future exchange rate movement, i.e. appreciation or depreciation.

We expect the condition to hold because the expected exchange rate should be just enough to offset the potential gains from interest rate differential between two countries; otherwise, the potential profits will be quickly arbitrated away, leaving no money on the table, anyway.

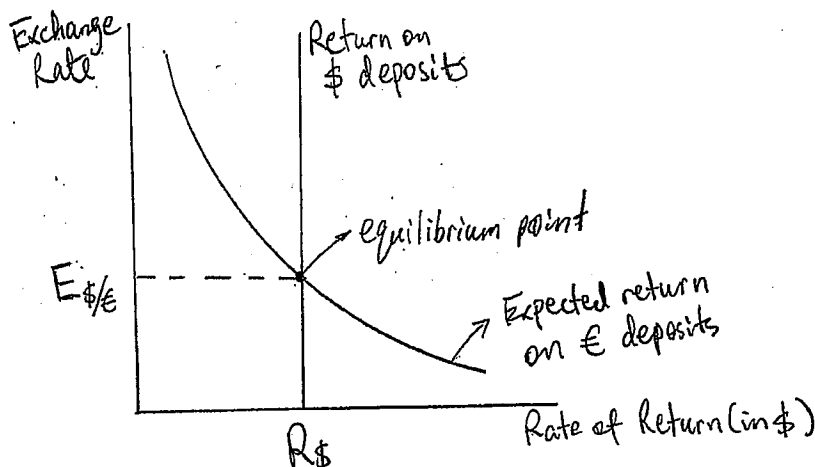
This condition requires the assumption of 1) fully-informed investors, and 2) investors always can and will arbitrage away profits. If these two assumptions break down, the interest parity condition will not hold.

- b) Write down the covered interest parity (CIP) condition in a similar fashion, and explain what it means intuitively. (5 points)

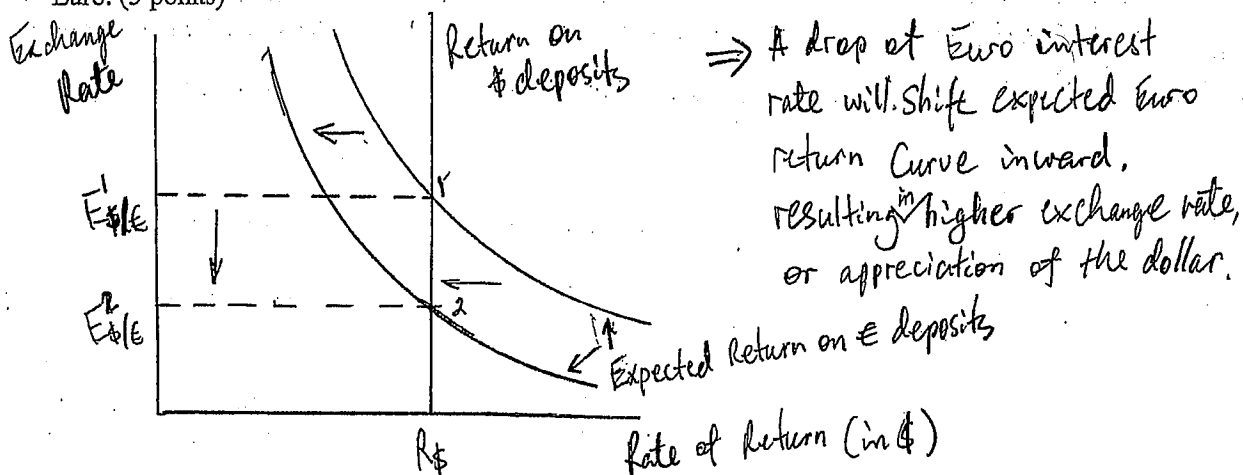
Answer: CIP is very similar to UIP. The only difference is to replace E^e with F , which is forward exchange rate, so we have $R = R^* + (F - E) / E$.

Intuitively, it means that the forward exchange rate will be just enough to offset the interest rate differential between two countries so there will be no profits to be made by moving money across countries.

- c) Now let's rewrite interest parity condition in a) with US dollar and Euro, so we have, $R_{\$} = R_{\text{€}} + (E^e_{\$/\text{€}} - E_{\$/\text{€}}) / E_{\$/\text{€}}$. Draw a diagram to show the equilibrium when the parity condition holds. (3 points)



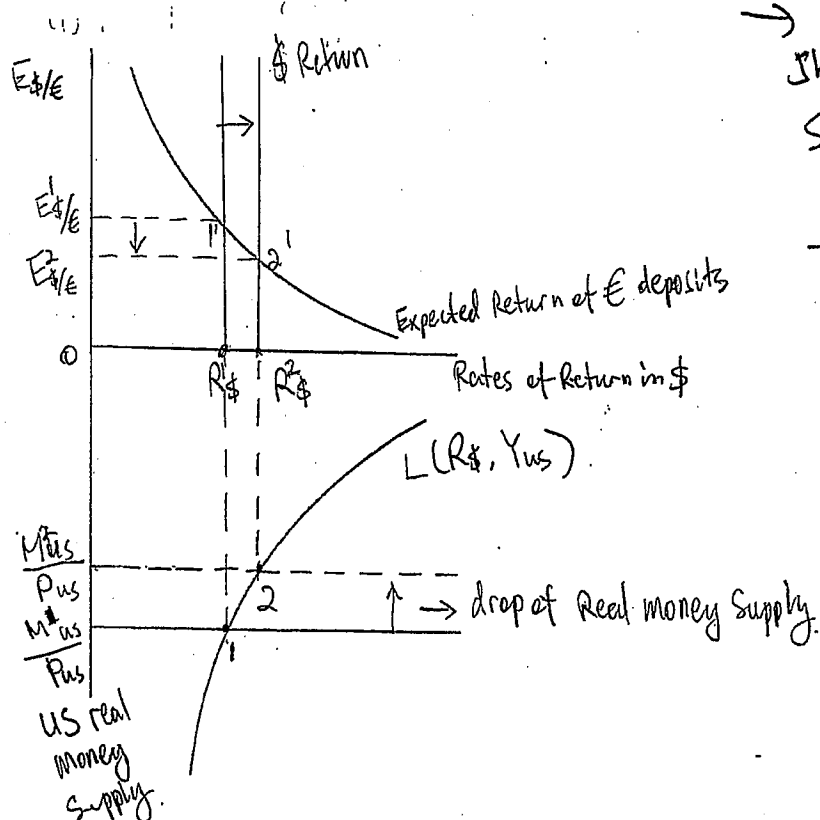
- d) Now there is a drop of Euro interest rate, draw a new diagram to show how this change of Euro interest rate will change the exchange rate between US dollar and Euro. (3 points)



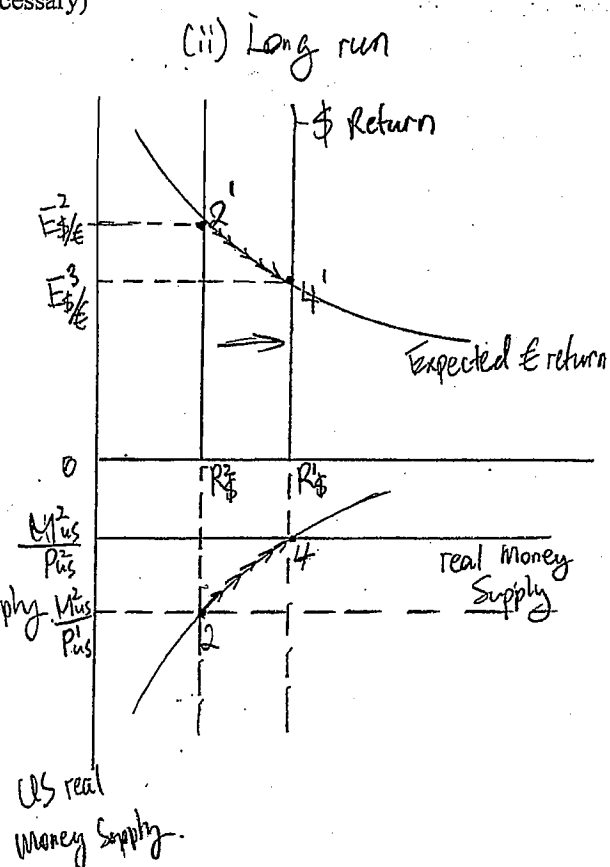
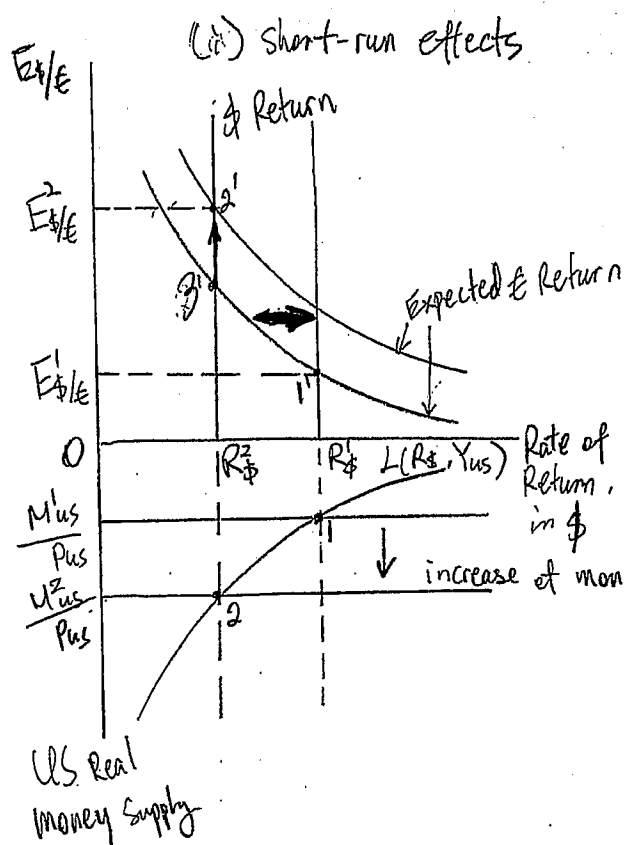
- e) Now, there is a sudden drop of money supply in the US. Show how this change of money supply will change the exchange rate between \$ and Euro in the short run (and compare it with the equilibrium in c). Use diagrams, if necessary, to help you explain. (6 points)

Note: It's OK not to consider "overshooting" at this point. But if you did, you'd be given credit too.

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- f) Finally, explain intuitively why an increase of money supply in the US will cause an overshooting of dollar exchange rate in the short run. Can you use the same intuition to explain an under-shooting of the dollar (i.e., overshooting on the down side) when money supply declines? (8 points, use graphs if necessary)



This is because in the short-run, price is sticky or slow to adjust, so an increase of money supply increases REAL money supply from $\frac{M^1_{us}}{P_{us}}$ to $\frac{M^2_{us}}{P_{us}}$.

More importantly, the increase of money supply raises people's expectation of U.S. inflation rate, decreasing the Real return of \$ deposits. In other words, the expected £ Return increases, shifting the curve outward. This causes the exchange rate to "overshoot" to 2' or $E^2_{\$/\pounds}$. In the long-run, $P^1_{us} \rightarrow P^2_{us}$, exchange rate will adjust back from $E^2_{\$/\pounds}$ to $E^3_{\$/\pounds}$, shown in the graph.

Yes, the opposite could be true if there's drop of money supply.

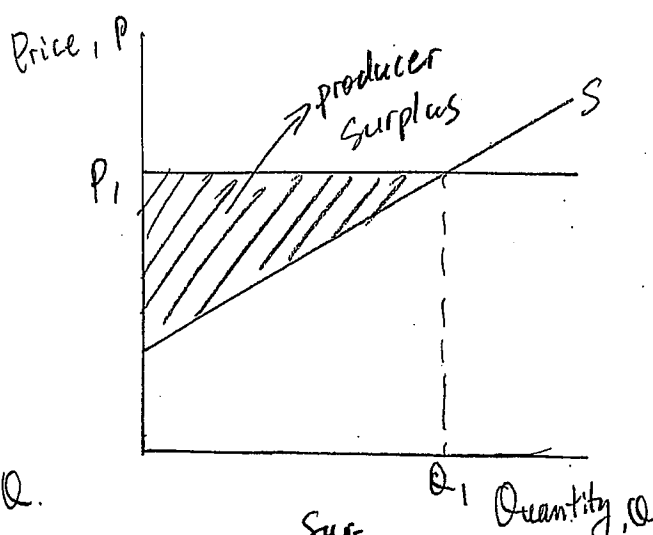
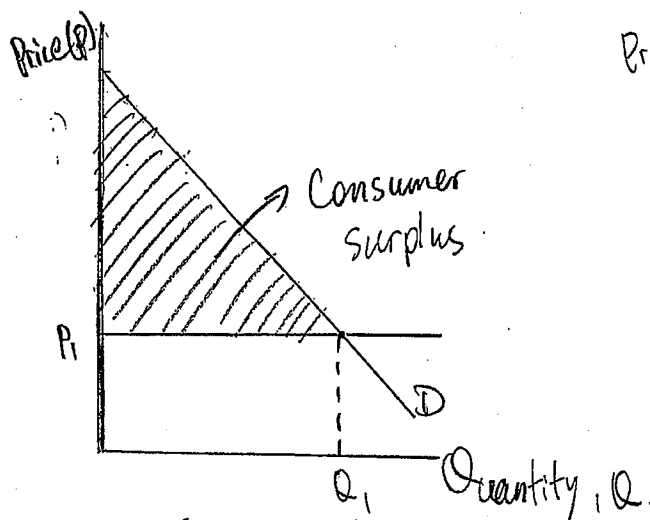
The drop of money supply lowers investor's expectation of US inflation rate, causing $E_{\$/\pounds}$ to overshoot on the down side, or larger appreciation of US dollar than without considering inflation expectations. In the long run, as price adjusts, the exchange rate will return to normal.

Problem 3 (Total points 25)

- a) What is TOT, or terms of trade? (2 points)

Answer: TOT is the relative price between a country's exports (P_x) and imports (P_m), or P_x / P_m .

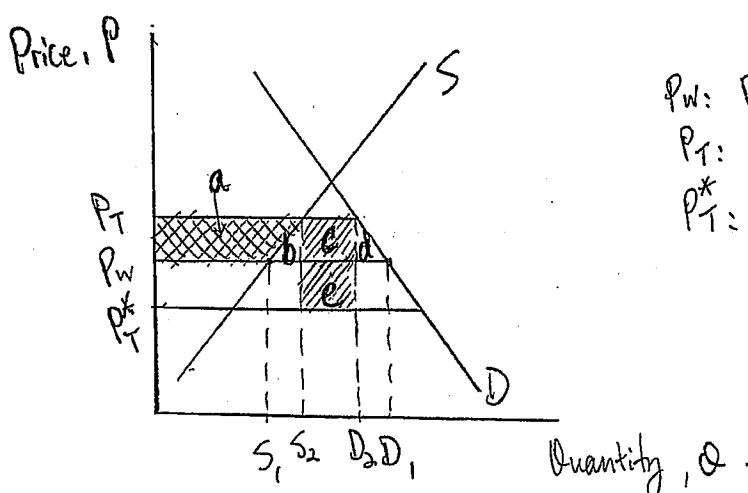
- b) What is consumer surplus and producer surplus, respectively? Draw graphs to illustrate and label clearly. (6 points)



sur-
Consumer plus is the sum of the gains between the price consumers are willing to pay, and the price they actually paid.

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producer plus is the sum of the gains from the extra money sold above producer's cost of supply.

- c) When home country, a large country, imposes a tariff on foreign imports, what are the impacts on home country's welfare? Draw a diagram and explain. Clearly label your graph. (10 points) (*Hint: welfare is a sum of gains/loss of three segments: consumer, producer and government.)



P_W : price before tariff
 P_T : domestic price after tariff
 P_T^* : foreign export price after tariff

When a large country imposes an import tariff, domestic price rises to P_T , and foreign export price declines to P_T^* . The total welfare is:

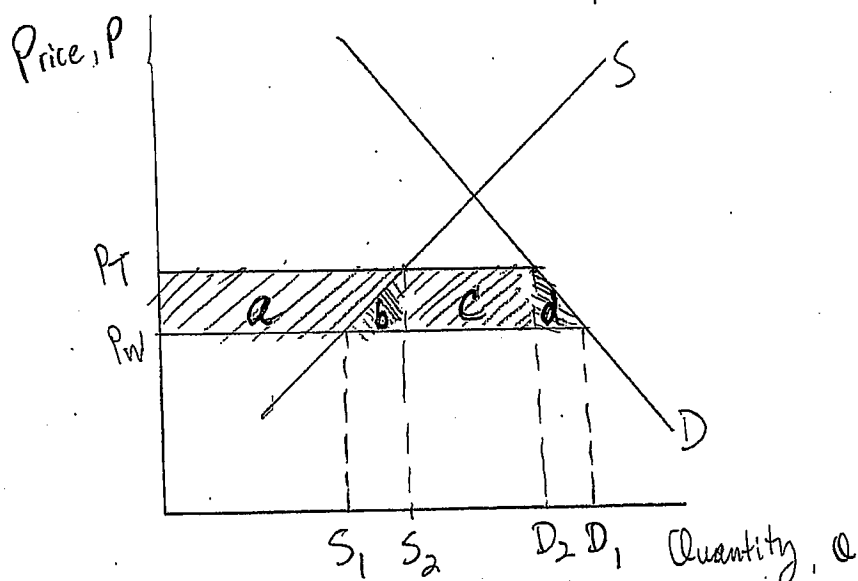
$$\begin{aligned} & \text{Consumer surplus} + \text{producer surplus} + \text{gov. revenue} \\ &= -(a+b+c+d) + a + (c+e) = -(b+d-e) \end{aligned} \quad 5$$

$$\text{Sum of welfare} = -(b+d-e)$$

The sign of the welfare is ambiguous, it depends on the relative size of e (TOT gain) and $b+d$ (efficiency loss).

- d) If home country is a small country, what are the welfare impacts? How is it different from the case in c)? Draw a diagram and explain. (7 points)

In the case of small country, since small country has no impact on world price, the export price will stay the same. domestic price will rise from P_W to P_T .



Consumer Surplus: $-(a+b+c+d)$

producer Surplus: a

government revenue: c

Total welfare: $-(\cancel{a+b+c+d}) + \cancel{a} + \cancel{c} = -(b+d) < 0$

So small country will suffer, unambiguously, a welfare loss.

Problem 4 (Total points 25)

The following questions are related to the issue of *trade and inequality*.

The US imports huge amount of goods from China each year. Because the labor cost in China is much cheaper (3% of US level according 2007 estimate), those imported goods tend to drive down the price of similar products in the US. Let's assume the US has two sectors: high-tech and low-tech, the latter of which is in direct competition with China.

- a) What is the impact of China's imports on relative wages between the two sectors in the US? Explain within the context of Stolper-Samuelson theorem. (5 points)

Answer: China's exports will drive down the price of low-tech goods in the US. According to Stolper-Samuelson theorem, this increase of relative price of high-tech goods will increase the relative return of the factor (i.e. high-skilled labor) used more intensively in the high-tech sector. The return of the high-skilled labor is just the wage they earn. So cheap Chinese exports will bring an increase of relative wage of high-skilled workers vs. low-skilled workers, thus increasing the income inequality between the two groups.

- b) If above effect as implied by Stolper-Samuelson theorem persists (because China is such a populous country), what impact would it have on the career choices of US labor force in the future? Imagine you are the parents who will be helping your children choose their college majors and career. (5 points)

Answer: If this income divergence effect were to persist, people will respond naturally by shifting into high-tech sector because the wage there is higher. Also, more people will want to pursue higher education, and build up their training and skills in school, and it's likely that people will want to avoid going into the industries that are in direct competition with China's cheap exports.

- c) Based on your answer in b), how would this new landscape in career choices affect the future growth rate of the US? Is this impact going to be positive or negative? What is your assessment and explain why you think so. (5 points)

Answer: It's likely that China's competition in low-tech goods will induce the US to shift focus and specialize more in high-tech sectors. This induced effect could put the US economy onto a more advantageous position in innovations and new technology in the coming decades. As we know, a country's long-term growth depends on innovation and technology, so this will be a positive development for the US.

China's cheap exports could also have large negative impact on the US, and the key here is how fast the US economy can adapt and shift out of the low-tech sector. If the US fails such transition, maintaining a large chunk of labor force in low-tech sector, it's very likely that either the US will change its stance on free-trade, or we will witness a large displacement of US low-skilled workers.

- d) Based on your answer in c), how will the wage inequality in the US be further affected? Essentially, this is your prediction of future US inequality, assuming everything else being equal. (2 points)

Answer: Initially, it's likely we will witness a continued increase of wage inequality between the two labor forces. But as more and more people shift their work into high-tech sectors, the inequality in the US will improve. So the inequality in the US is a function of the speed of labor transformations.

- e) Now let's turn to China: What's the prediction of China's wage in tradable sectors? Will it rise or fall? What about the wage in non-tradable sectors? Be sure to explain why you think so. (8 points)

Answer: According to Factor Equalization Theorem, the wage in China's tradable sectors will rise. In addition to rising pressure on labor cost, the larger international market, specialization, and increasing capital intensity all push up labor productivity in export sectors, thus resulting in higher wages.

The wage in non-tradable sectors is also likely to increase. This is because the increasing income in tradable sectors will increase demand for services, especially in the area where the export sectors are heavily concentrated. This spillover effect pushes up the wage in non-tradable sectors, which is line with the prediction of Balassa-Samuelson effect.

(Optional) Another factor to consider is the supply of labor. Above analysis assumes no change in labor supply but as we know, if China further relaxes its restriction on the movement of migrant workers from the rural area, this increased labor supply will likely push down wages, everything else being equal.