

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

Final Exam  
October 22, 2010

*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 you clearly label them.*

**Problem 1 (Total points: 25; 5 points each)**

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

- a) When GDP per capita is measured by PPP, generally you observe people in developing countries have higher living standards than the level when GDP per capita is measured by nominal exchange rate.

**A: True.** PPP takes into consideration of the real purchasing power of consumers in each country. Because prices in developing countries are generally lower, especially for the goods and services in the non-tradable sectors, the real purchasing power in developing countries is generally higher when measured in PPP term.

- b) When a country has \$200 billion surplus on its current account, it implies that it also has \$200 billion surplus on its financial account because that's the amount of money it earned through net exports.

**A: False.** In Balance of Payments (BoP) accounting, a surplus (credit) on current account will be matched by a deficit (debit) on financial account, not the surplus. Plus, the explanation was also incorrect - a financial account surplus is not the payment received from net exports; it measures foreign capital inflow.

- c) The interest rate in Brazil is 10%, and the interest rate in the US is 0.25%. The current spot exchange rate between US and Brazil is 1.60 Brazilian real per US \$, and the forward contract in 6 months is traded at 1.80 Brazilian real per \$. According to the information provided above, investors will make money within 6 months by borrowing US \$ and invest in Brazilian real.

**A: False.** Interest differential is 9.75%. Since after 6 months, investors need to convert Brazil real into US dollar, we first express the exchange rates in terms of US \$ per Brazilian real. So 1.60 real/\$ becomes 0.625 (or 1/1.60) \$/real, and 1.80 real/\$ becomes 0.5556 (or 1/1.80) \$/real. How much will

Brazilian real depreciate in 6 months? The rate of depreciation is:  $(0.625 - 0.5556) / 0.625 = 11.1\%$  (alternatively, the depreciation rate can be calculated as  $(1.8 - 1.6) / 1.8 = 11.1\%$ ). Since the rate of depreciation of Brazilian real is bigger than the interest differential,  $11.1\% > 9.75\%$ , investors will lose money by moving money from the US and invest in Brazil.

- d) The current interest rate in the US is 0.25%, and the current interest rate for the EU is 1%. When the Fed is expected to raise interest rate sooner than the ECB (European Central Bank), US dollar will appreciate against the Euro.

**A: True.** When the Fed is expected to raise interest rate first, the interest differential between the US and EU is expected to become positive, and assets denominated in the US dollar are perceived by investors as relatively more attractive, and money will flow into the US. Thus, the US dollar will appreciate against the Euro.

- e) Under the gold standard, when the US lowers its interest rate, every other country under the gold standard has to lower their interest rate too.

**A: False.** Under the gold standard, when the US lowers interest rate, gold will flow out of the US. Other countries don't need to lower interest rate since they actually attract more gold inflows. However, the opposite is not true - if the US raises its interest rate, gold will flow into the US, then other countries will have to match the US' interest rates in order to maintain gold reserves within their borders. Otherwise, they face the danger of breaking the fixed link between their currencies and gold.

**Problem 2 (Total points: 15)**

The following table shows you the unit labor requirements for producing wine and car in the US and France. Assume there is no wage difference between the two countries, and there is no quality difference for the products that both countries produce.

Unit labor requirements		
	Wine	Car
The U.S.	0.5 hour/L	0.1 hour/unit
France	0.8 hour/L	0.2 hour/unit

- 1) What's the opportunity cost of producing TEN liters of wine in the US? What's the opportunity cost of producing TEN liters of wine in France? And in which industry does the US enjoy the comparative advantage? (5 points)

**Answer:** The opportunity cost of producing ONE liter of wine in the US is  $0.5/0.1 = 5$  cars. So the opportunity cost of producing TEN liters of wine in the US is  $5 \times 10 = 50$  cars. Similarly, the opportunity cost of producing TEN liters of wine in France is  $0.8/0.2 \times 10 = 40$  cars.

Since the opportunity cost of producing wine in the France is smaller than that in the US, France enjoys comparative advantage in producing wine and the US enjoys the comparative advantage in producing car.

- 2) First convert the table above into a table of labor productivity, i.e., instead of expressing the numbers in unit labor requirements, express them in terms of quantity of products that can be produced using 1 labor hour. Then, decide in which industry France enjoys relatively higher labor productivity. (5 points)

**Answer:** Express the numbers in labor productivity, the table will become,

Labor productivity, per labor hour		
	Wine	Car
The U.S.	2 liters/hour	10 units/hour
France	1.25 liters/hour	5 units/hour

In wine industry, the relative productivity between the US and France is  $2/1.25 = 1.6$ ; in auto industry, the relative productivity between the US and France is  $10/5 = 2$ . So the US enjoys relatively higher labor productivity in producing car, and France enjoys relatively higher labor productivity in wine industry. That's also where France has its comparative advantage.

- 3) From your answers above, in which industry does the US enjoy the absolute advantage? And briefly explain why the US can benefit from free trade. (5 points)

**Answer:** From the answers above, we know US has absolute higher labor productivity in both wine ( $2 > 1.25$ ) and auto industries ( $10 > 5$ ), so the US enjoys absolute advantage in both industries.

Even though the US has absolute advantage in both industries, it is relatively more efficient in producing cars than wine. If we were to allow the US to specialize (completely or marginally more) in auto industry, and let France specialize in producing wine, each country now produces the good, which they are relatively best at, so the total world output will increase. With free trade, both countries benefit from consuming more goods and at lower prices.

### Problem 3 (Total points: 20)

Home country's demand curve for banana is  $D = 100 - 2P$ , and its supply curve for banana is  $S = 20 + 2P$ . Home country is also one of the largest importers of bananas in the world. Its import demand curve is  $MD = 90 - 5P$ ; and it faces the following export supply curve:  $XS = -10 + 5P$ .

- a) With free trade, determine the equilibrium price and trade volume. (5 points)

**Answer:** The equilibrium price under free trade is when  $XS = MD$ , i.e.,  
 $90 - 5P = -10 + 5P$ .

Solve the equation, we have equilibrium price,

$$P_w = 10.$$

And the trade volume is:

$$XS = -10 + 5 \times 10 = 40 \quad (\text{or } MD = 90 - 5 \times 10 = 40).$$

- b) Now home country imposes an ad valorem tariff of 20% on foreign banana imports. Determine the new trade volume and how the tariff by home country has changed the world banana price. (5 points)

**Answer:** After imposition of ad valorem tariff, the new import demand curve  
 $MD = 90 - 5P(1+0.2)$

And the export supply curve,  $XS$ , is unchanged.

At the new equilibrium, again we have,

$$MD = 90 - 6P = XS = -10 + 5P,$$

solve the equation, we have new world price:

$$P = 9.1. \text{ Let's denote this price as } P_{T^*}, \text{ i.e., } P_{T^*} = 9.1.$$

So the new trade volume is,

$$MD = 90 - 6P_{T^*} = 90 - 6 \times 9.1 = 35.4$$

$$(\text{or } XS = -10 + 5P_{T^*} = -10 + 5 \times 9.1 = 35.5).$$

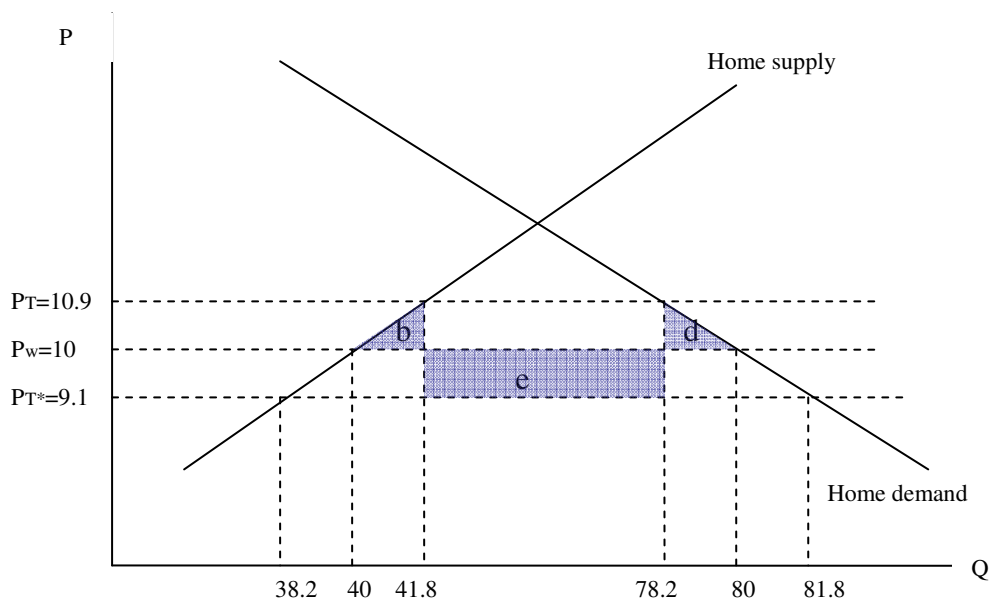
- c) Finally, by imposing the import tariff, has home country improved or reduced its net welfare? Draw graph(s) to illustrate and make sure to show your work. (10 points)

**Answer:** To draw the graph, we first calculate a few critical numbers on the x-axis.

Before imposing tariff,  $P_w = 10$ . Plug in  $P_w$ , we have domestic demand  $D = 100 - 2P_w = 100 - 2 \times 10 = 80$ , and domestic supply  $S = 20 + 2P_w = 20 + 2 \times 10 = 40$

After imposing tariff, domestic price  $P_T = P_{T^*}(1+0.2) = 9.1 \times 1.2 = 10.9$ . Plug in  $P_T$ , we have domestic demand  $D = 100 - 2P_T = 100 - 2 \times 10.9 = 78.2$ , and domestic supply  $S = 20 + 2P_T = 20 + 2 \times 10.9 = 41.8$

What would be the domestic demand and supply when  $P_{T^*} = 9.1$ ? Plus in  $P_{T^*}$ , we have domestic demand,  $D = 100 - 2P_{T^*} = 100 - 2 \times 9.1 = 81.8$ , and domestic supply  $S = 20 + 2P_{T^*} = 20 + 2 \times 9.1 = 38.2$



(Note: The new trade volume, as shown in the graph, is  $36.4 = 78.2 - 41.8$ , which roughly equals 35.4 calculated in section b.)

**Net welfare loss = consumer loss–producer gain–TOT gain =  $b + d - e$**

$$b = 0.5 \times (41.8 - 40) \times .9 = .81;$$

$$d = 0.5 \times (80 - 78.2) \times .9 = .81;$$

$$e = (78.2 - 41.8) \times .9 = 32.76$$

So  $b + d - e = .81 + .81 - 32.76 = -31.14 < 0$ . Since the loss is a negative number, home country must have gained by imposing tariff in this case.

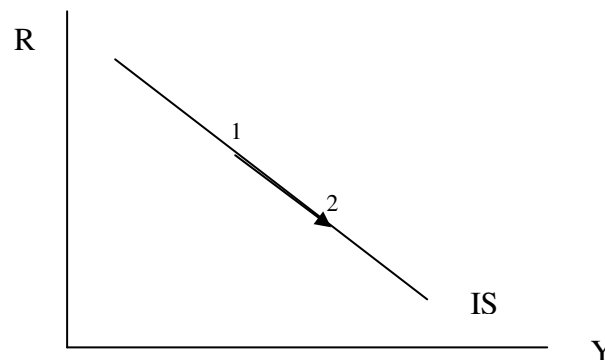
#### Problem 4 (Total points: 20)

Denmark pegs its currency, Danish Kroner (or DKK), to the Euro, at roughly 7.45 DKK per euro. Denmark's neighboring country, Norway, does not.

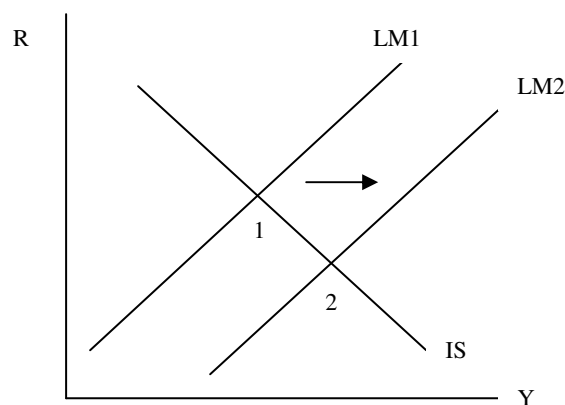
- a) When European Central Bank (or ECB) lowered its interest rate sharply during the recent global recession, how did it affect the monetary policy in Denmark? And how did this monetary expansion by ECB further affect the output level in Denmark? Draw graph(s) to help you explain. (5 points)

**Answer:** Since Danish Kroner is pegged the Euro, the interest rate in Denmark must equal to the interest rate controlled by the ECB, i.e.,  $R_{EU} = R_{DK}$ . When ECB lowers its interest rate, Denmark must also lower its own interest rate in order to keep Danish Kroner fixed to the Euro. In other words, an expansionary monetary policy at ECB automatically means a monetary expansionary in Denmark.

When Denmark lowers its interest rate  $R$ , according to IS curve, output  $Y$  will increase, as shown below:



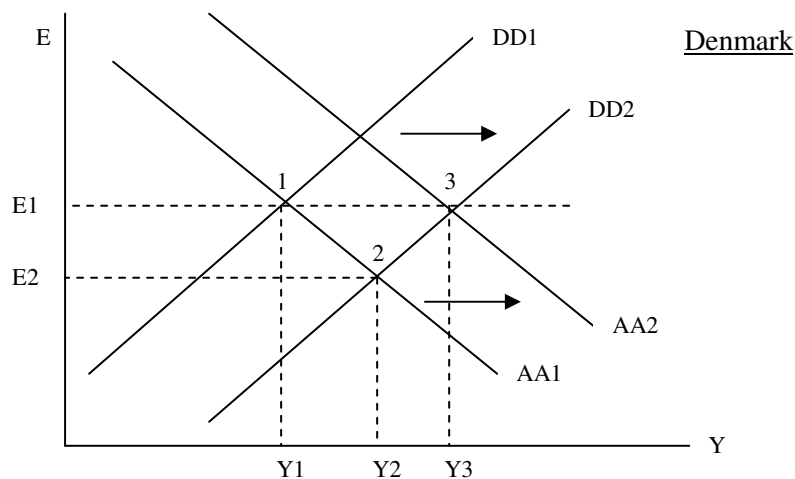
Alternatively, you can answer this question within the IS-LM framework. Since central banks often lower interest rate by increasing money supply (a shift of LM curve from  $LM1$  to  $LM2$  in the graph below), the equilibrium point move from point 1 to 2, corresponding to a higher output level.



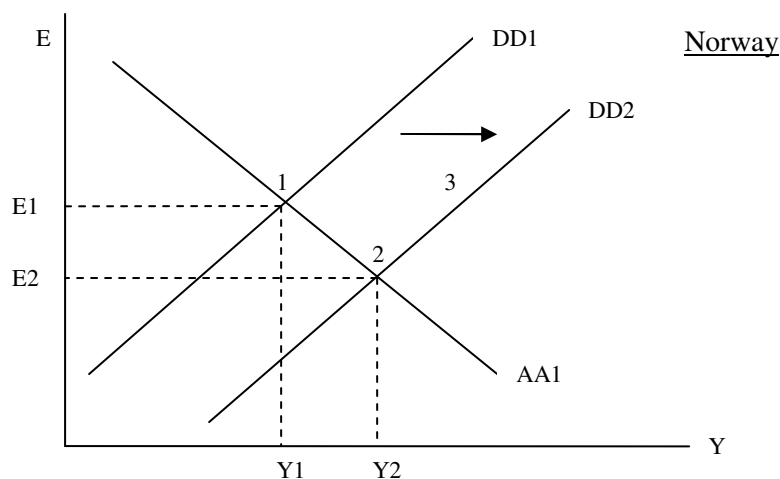
- b) To increase output and reduce unemployment, both Denmark and Norway engaged in expansionary fiscal policies during the recession. Compare and contrast the effects of fiscal policy on the output in both countries. Make sure you use diagram(s) to help you illustrate. (10 points)

**Answer:** Since Denmark has fixed exchange rate regime, the effect of an expansionary fiscal policy on its output will be magnified. In contrast, Norway has floating exchange rate regime, and its expansionary fiscal policy will have a smaller effect on output when compared to Denmark.

We can show this difference using a typical DD-AA schedule. At point 2, when an expansionary fiscal policy shifts DD curve from DD1 to DD2, exchange rate will appreciate from E1 to E2, and output will increase from Y1 to Y2. To keep exchange rate fixed at E1, Denmark has to increase its money supply so that AA1 shifts rightward to AA2. By doing so, exchange rate is restored to E1 (at point 3), and output increases from Y1 to Y3, which is at a higher level than Y2.



In contrast, since Norway does not need to keep its exchange rate at a fixed level, the output will just increase from Y1 to Y2, which is smaller than Y3.



- c) During the recent recession, Nordic countries, including Denmark, have had much better economic performance when compared to other member countries in the EU. Let's assume that this diverging economic performance is likely to persist over time and the difference is largely due to the different economic structures between the Nordic countries and other EU countries. Given the information provided above, discuss the potential drawbacks of fixing DKK to the Euro. (5 points)

**Answer:** When Denmark tends to have persistent better economic performance than other EU member countries, a too-easy monetary policy by the ECB tends to overheat Danish economy.

Let's imagine the scenario where Denmark and Euro area countries both fall into recession, but Danish recession is much less severe than other European countries. The more severe recession in the Euro area requires the ECB to lower its interest rate to a much lower level than that of Denmark, at which Danish economy is at its full employment level.

But since DKK is pegged to the Euro, Denmark lost its autonomy on monetary policy. So its interest rate has to stay at the same low level controlled by the ECB. This lower interest rate tends to cause inflation to rise over time to an undesirably high level, overheating the Danish economy.

### **Problem 5 (Total points: 20)**

Read the article from the New York Times (NYT) on the next page and answer the following questions.

- a) According to the article, it is estimated that so far in 2010, "\$825 billion will flow into developing countries this year, 42% more than in 2009". Without knowing interest rates in advanced and emerging economies, how would you adjust the theory of *Interest Parity Condition* (or UIP) you've learned in class to explain the large capital inflow to the emerging economies? Draw graph(s) if necessary to illustrate. (8 points)

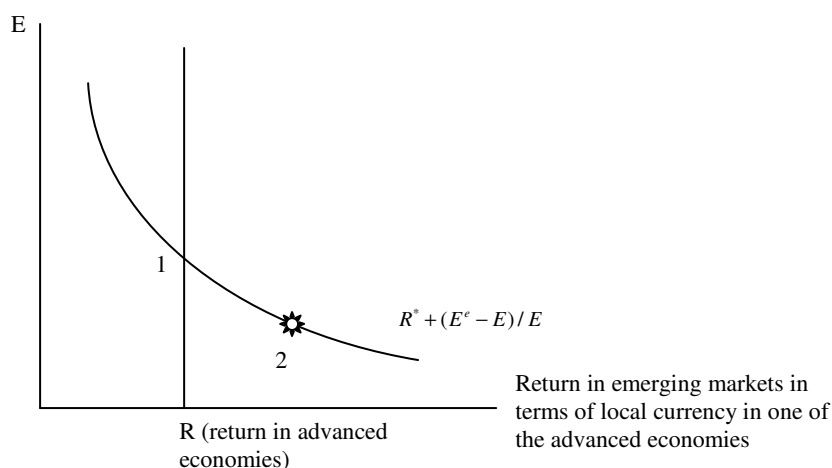
**Answer:** To explain the capital outflows from developed markets into emerging markets, we can relax the original interpretation of the interest rates embedded in interest parity condition,  $R = R^* + (E^e - E) / E$ . Instead of interpreting them as bank deposit rate, here we can interpret  $R$  (or  $R^*$ ) as the asset return in a broader sense, which could mean the return on bonds, stocks and many other investments.

Further, we assume higher growth rate is often correlated with higher asset returns (\*note that this is not *always* the case, but at least most investors anticipate so). Since the growth rate in emerging economies in 2011 is expected to be 6.3%, much higher than the 2.4% expected growth rate in advanced economies, it gives investors enough incentives to move their money in order to seek higher returns in emerging markets.



In the context of UIP, investors expect the following to hold true,  
 $R^* + (E^e - E) / E > R$ . As long as the above inequality condition holds,  
 investors will keep moving money into emerging economies.

To show it in graph, when investors engage in the emerging market carry trade,  
 the FX market is at point 2, a point out of equilibrium (point 1).



- b) According to the article, what are the chief concerns regarding the large capital inflows to emerging economies? (2 points)

**Answer:** When huge capital flows into emerging economies, they push up the value of their currencies, boosting imports and slowing exports, and they promote fast credit expansion — which tends to cause inflation, inflate asset bubbles and usually leave a pile of bad loans. Then when investors smell troubles, they tend to drive capital out of emerging economies all at once, in a panic mode, tipping countries into crisis – this is the so-called “carry-trade reversal”.

- c) One of the concerns is that large capital inflow is likely to cause inflation to rise and result in an overheated economy. Explain why this is likely to happen. (5 points)

**Answer:** When one country has large capital inflows, domestic money supply tends to be driven up as foreign investors convert foreign currency into local currency, and put them into local investment. We know  $MV = PQ$ , when the magnitude of capital inflows is large, domestic money supply can rise sharply due to either an increase of  $M$  or a rise of money velocity  $V$ , both of which tend to cause inflation to rise sharply, resulting in an overheated economy.

- d) To fight inflation, some propose that emerging economies raise their interest rates. Do you think the policy proposal will work as intended? Why or why not? What's the policy dilemma here? (5 points)

**Answer:** No, the proposal to raise interest rate will not be effective in containing inflation. Normally, higher interest rate will work because it decreases money supply and inflation is contained.

But as long as foreign capital is allowed to enter the country freely, higher interest rate tends to attract even more capital inflows because the interest differential between the country and advanced economies is widened. When these additional capital inflows are converted into local currency and invested, they again increase money supply and offset the contractionary effect of higher interest rate.

The policy dilemma here is that to fight inflation, central banks in emerging economies rely on raising interest rate and reducing money supply, but without some degree of capital control, foreign capital will continue to flood in, potentially rendering the policy ineffective.

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October 13, 2010

## **The Next Bubble**

It seems premature to start worrying about the next financial crisis. Yet amid the current gloom, Wall Street is snapping up assets of the “emerging economies” that are growing faster. According to recent IMF economic forecast, in 2011, advanced economies are projected to grow by only 2.4%, while emerging and developing economies are expected to grow by 6.3%.

The Institute of International Finance, which lobbies for big banks, estimates that \$825 billion will flow into developing countries this year, 42 percent more than in 2009. Investments in debt of emerging economies alone is expected to triple, to \$272 billion.

While developing countries often benefit from foreign investments, huge inflows of capital complicate their macroeconomic management. They push up the value of their currency, boosting imports and slowing exports, and they promote fast credit expansion — which can cause inflation, inflate asset bubbles and usually leave a pile of bad loans. This money turns tail at the first sign of trouble, tipping countries into crisis.

Those are the dynamics behind Mexico’s 1994 “tequila crisis,” the 1997 Asian crisis, the 1998 Russian catastrophe, the 1999 Brazilian debacle and the 2002 Argentine collapse. The housing bubble that burst here in 2008 was painfully similar, with irrational investments and then a sudden flight.

A collapse in emerging market bonds would further damage the weak balance sheets of American banks. Still, it is not time to panic. Developing countries are in relatively good economic shape, while interest rates in the wealthy countries are likely to stay low for years. Yet the financial system remains fragile. And a shock — say a default in Ireland or Greece — could prompt a fast U-turn away from emerging markets.

There is little policy makers in the rich world can do to stop these flows. Governments in the developing world must prepare now for when the money masters change their minds.

That means they cannot let their budgets get out of hand. And they have to keep a very close eye on their own banks. This might also be a good time to consider capital controls to slow inflows. Chile managed them successfully in the 1990s. Even the International Monetary Fund — long a foe of anything that got in the way of money — acknowledged this year that controls should be part of the toolkit.