

Midterm Exam I

Answer Sheet

1. (20%) Country X had a current account deficit of \$1 billion and a nonreserve capital account surplus of \$500 million in 2001.

(a) What was the balance of payments of X in that year? What happened to the country's net foreign assets?

brief answer Since non-central bank capital inflows fell short of the CA deficit by \$500 million, the B of P deficit ("above the line") was -\$500 million. The country had to finance \$1 billion so NFA declined by \$1 billion.

(b) Assume that foreign central banks neither buy nor sell X's assets. How did the central bank of X's foreign reserves change in 2000? How would this official intervention show up in the balance of payments accounts of X?

brief answer The Central Bank of X lost \$500 million in foreign reserves, to cover that portion of the CA deficit not financed by private capital flows.

(c) How would your answer to (b) change if you learned that foreign central banks had purchased \$600 million of X's assets in 2001?¹ How would these official purchases enter foreign balance of payments accounts?

brief answer If foreign CB's purchased \$600 million of X's assets the country had a BoP surplus of \$100 million. They needed only \$1 billion in inflows to offset the CA deficit, but \$1.1 billion flowed in. So reserves increased by an extra \$100 million.

2. (30%) Consider the economy of Macronesia (which is small despite its name). Here people have access to world capital markets but they choose neither to borrow or lend. In a two-period diagram draw production opportunities and indifference curves for Macronesia, and draw the world interest rate. Label the consumption point as A.

brief answer the production possibilities curve and the indifference curve are tangent to each other and the budget line with the slope $1 + \hat{r}$ where \hat{r} is the world interest rate (see figure 1):

3. (a) Imagine that a great innovation is discovered which will greatly increase future income in Macronesia. How does the production opportunities set shift? What would happen to consumption if Macronesia did not have access to world capital markets? Label this consumption point B.

¹Note that the exam actually said 2000 rather than 2001, an obvious typo. Since it was my fault I did not take away any points for those who did not recognize that it was just a typo. But here I produce the correct question and answer for your information.

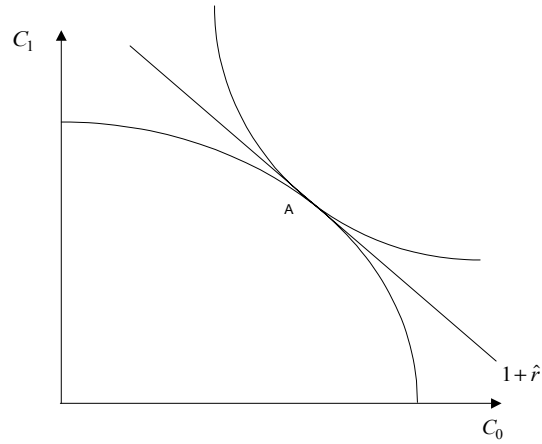


Figure 1:

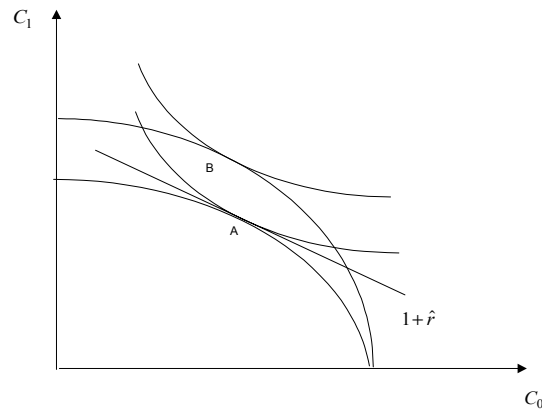


Figure 2:

brief answer Slope becomes steeper as there are more opportunities for future production. If there were no access to world capital markets then consumption would shift towards the future; hence, present consumption would likely decrease (see figure 2)

(b) *What happens to the autarky rate of interest in Macronesia? Explain.*

brief answer The autarky rate rises, as the interest rate where there is no desire for trade in future goods requires a higher rate to reflect the higher production opportunities.

(c) *If Macronesia has access to the world capital markets what happens to production and consumption? Explain. Label the new consumption point C. What happens to the current account balance of Macronesia?*

brief answer Macronesia will produce where $1 + \hat{r}$ is tangent to the production line. This will involve more future production. It will then borrow against this to finance current consumption. Current consumption will be higher than in part (b), see figure

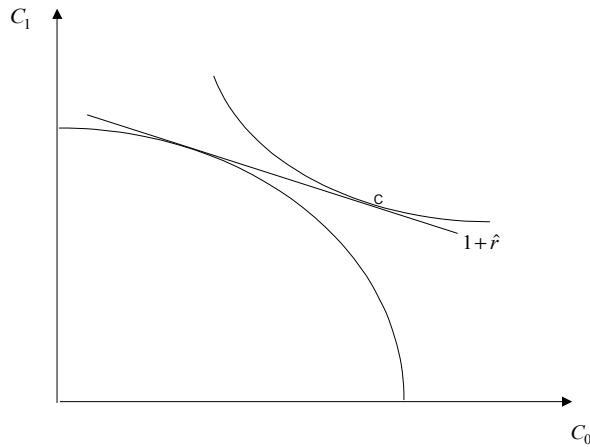


Figure 3:

3:

- (d) *Suppose that instead of discovering a great innovation a war elsewhere raises world interest rates. What happens to consumption and savings in Macronesia?*

brief answer With higher world interest rates Macronesia will increase savings and defer consumption to the future. The budget line becomes much steeper. The production point rotates to the southeast and the consumption point to the northwest. If the world interest rate rises high enough foreign lending becomes more profitable than domestic investment – the rate of return to the former is rising. Macronesia runs a current account surplus now to finance future consumption.

4. (20%) *Suppose that the domestic interest rate on a three month deposit is 5% and that the interest rate on a similar deposit in euroland is 10%. If the uncovered interest parity condition holds, what does the market predict will happen to the exchange rate (dollar price of euros)? Explain.*

brief answer UIP implies that the expected depreciation of the domestic currency is equal to the nominal interest differential:

$$i - i^* = \frac{\hat{e}_{t+1} - e_t}{e_t} \equiv \delta_t$$

so this means that the market predicts that the dollar will appreciate in value by 5%. The capital loss on holding euros is offset by the positive interest differential.

- (a) *What is the difference between covered interest parity and uncovered interest parity?*

brief answer In the covered transaction there is no currency risk because the investor has already purchased a forward (or futures) contract to repatriate the foreign currency back into dollars. In the uncovered transaction the investor has not hedged this currency risk.

- (b) *Why might uncovered interest parity not hold even though covered interest parity does? Explain.*

brief answer If investors are risk averse that would explain such a divergence. Such investors would demand a premium to hold the risky investment.

4. (10%) *From 1990 through 1996 Thailand experienced large current account deficits of approximately 8 to 9% of GDP. Subsequently, the current account went into a surplus of about 8% of GDP. Why was this shift associated with a sharp recession in Thailand? Explain.*

brief answer A sudden reversal in the current account requires a big switch in expenditure. Net exports must rise dramatically to accomplish this (you cannot rapidly increase interest income, that depends on past debt which takes time to adjust). How can net exports be increased quickly? Either imports must fall or exports must rise or both. Spending on consumption, investment, and government spending must decrease so that net exports can rise, recall that $Y = C + I + G + NX$. This fall in domestic spending is likely to spark a sharp recession. Moreover, the decrease in capital inflows almost surely raises interest rates which also hurts investment and pushes the economy to recession.

5. (20%) *Suppose that I hold a long position in the euro. I could hedge my risk with a futures contract or with an option. Explain how this would work and the advantages of each alternative.*

brief answer Since I am long in the euro the risk I face is that it might depreciate. I could purchase now a contract to deliver euros for dollars at a given rate, hence eliminating the currency risk via the futures market. Of course, I would lose any profits if the euro appreciates. Alternatively, I could buy a put option on the euro. This would entitle me to sell euros at some strike price, and would insure me against a significant fall in the value of the euro. If the euro appreciated I could let it expire and profit from my long position.

- (a) *What happens to my position if the euro appreciates? What happens if it depreciates?*

brief answer With the futures contract my position does not change with a change in the value of the euro. The opportunity cost is the foregone gains to offset the foregone losses. With the put option on the other hand my position gains value with euro appreciation and loses value with depreciation, to the floor provided by the strike price. This is evident in the figure:

- (b) *How does the underlying volatility of the euro exchange rate affect my decision between futures and options? Explain.*

brief answer Volatility makes the option alternative more advantageous. The key difference between the two is that the put option does not have to be exercised. It can expire if the euro appreciates. With futures contract potential profits are sacrificed. If the euro has low volatility then the likelihood of large gains are small, so why pay the insurance premium (the option price) for the small chance of these gains. But

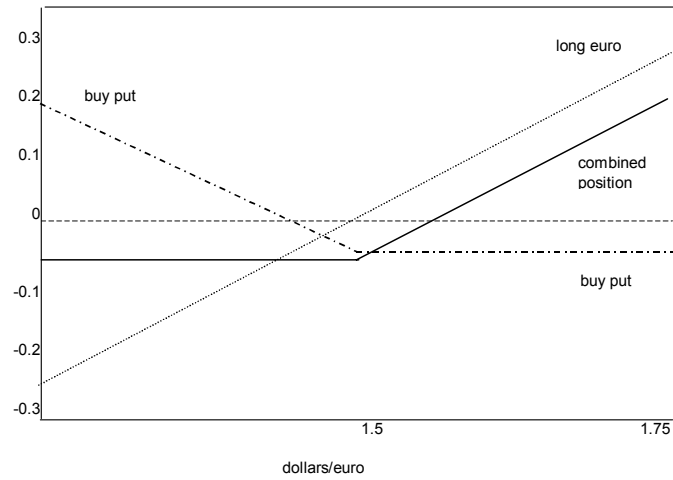


Figure 4: Using a put to hedge a long position in the euro

if the euro is more volatile then the chance for large gains is bigger. The option contract preserves the chance for these profits, while the futures contract eliminates them. So more volatility makes options more valuable.