**FIN333 Global Finance**

Homework Assignment 2

Please submit your homework on CourseSite in a single file in .pdf format with file name as ‘your last name FIN333HW2.pdf’. The deadline is Sep. 29th, 2021(Wed), 11:59 pm.

*\*You need to show your work to get credit.*

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1. (5 points) Suppose the spot ask exchange rate, Sa($|£), is $1.90 = £1.00 and the spot bid exchange rate, Sb($|£), is $1.89 = £1.00. If you were to buy $10,000,000 worth of British pounds and then sell them five minutes later, how much of your $10,000,000 would be "eaten" by the bid-ask spread?

The investor buy £ at Sa($|£), sell £ at Sb($|£)

$10,000,000/($1.90/£)=£5,263,157.90

£5,263,157.90\*($1.89/£)=$9,947,368.42

$10,000,000-$9,947,368.42=**$52,631.58**

1. (15 points) Use the table below to answer question a-d.

|  |  |  |
| --- | --- | --- |
|  | In U.S. $ (Direct quotations) | |
|  | Bid | Ask |
| Canadian Dollar (CAD) | 0.8653 | 0.8667 |
| Euro (€) | 1.4000 | 1.4200 |

1. What is the **bid** price of Canadian dollars in terms of euro **Sb(€/CAD)?**

Sb (€/CAD)= Sb (€/$)\*Sb ($/CAD)=(1/ Sa ($/€))\*Sb ($/CAD)=(1/1.42)\*0.8653=**0.6094**

1. What is the **ask** price of Canadian dollars in terms of euro **Sa(€/CAD)?**

Sa (€/CAD)= Sa (€/$)\*Sa ($/CAD)=(1/ Sb($/€))\*Sa ($/CAD)=(1/1.40)\*0.8667=**0.6191**

1. What is the **bid** price of euro in terms of Canadian dollars **Sb(CAD/€)?**

Sb (CAD/€)=1/ Sa (€/CAD)=1/0.6191=**1.6153**

1. What is the **ask** price of euro in terms of Canadian dollars **Sa(CAD/€)?**

Sa (CAD/€)=1/ Sb (€/CAD)=1/0.6094=**1.6410**

1. (10 points) Suppose you are a U.S.-based investor with $1,000,000 to invest. The dollar-euro exchange rate is quoted as $1.60 = €1.00 and the dollar-pound exchange rate is quoted at $2.00 = £1.00. If a bank quotes you a cross rate of £1.00 = €1.20. Are there any arbitrage opportunities? What transactions will you carry out? How much profit in $ can you make?

The no arbitrage cross rate S(€/£)=S(€/$)\*S($/£)=(1/1.60)\*2.00=1.25

The bank quotes S(€/£)=1.2, thus £ is undervalued.

1. Convert $1,000,000 to €625,000 at $1.60 = €1.00,
2. Convert €625,000 to £ 520,833 at the bank quote £1.00 = €1.20
3. Convert £ 520,833 to $ 1,041,667 at $2.00 = £1.00

Profit=1,041,667-1,000,000=**$41,667**

1. (15 points) Using the table below to answer question a-c

|  |  |
| --- | --- |
| Country | In US $ |
| **UK Pound** | 2.0000 |
| 1-mos forward | 2.0100 |
| 3-mos forward | 2.0200 |
| 6-mos forward | 2.0300 |
| **Euro** | 1.5000 |
| 1-mos forward | 1.5100 |
| 3-mos forward | 1.5200 |
| 6-mos forward | 1.5300 |

1. What is the spot cross-exchange rate between pounds and euro **S(£/€)**?

S(£/€)=S(£/$)\*S($/€)=(1/ S($/£))\*S($/€)=(1/2.00)\*1.5=**0.7500**

1. What is the 6-month forward cross-exchange rate between pounds and euro **F6(£/€)**?

F6(£/€)=F6(£/$)\*F6($/€)=(1/ F6($/£))\*F6($/€)=(1/2.03)\*1.53=**0.7537**

1. What is 3-month forward premium or discount (expressed as an annual percentage rate) for the U.K. pound versus U.S. dollars (assuming 90 days for the 3-month forward)?

(F-S)/S\*(360/90)=(2.02-2.00)/2.00\*4=0.04=**4%**

1. (10 points) If the annual inflation rate is 2.5 percent in the United States and 4 percent in the U.K., and the pound depreciated against the dollar by 1.6 percent.
2. What is the real exchange rate?
3. What implication can we make about the competitiveness of domestic products based on the real exchange rate calculated in part a?

The competitiveness of domestic products deteriorates.

1. (5 points) As of today, the spot exchange rate is €1.00 = $1.60 and the rates of inflation expected to prevail for the next year in the U.S. is 2% and 3% in the euro zone. What is the one-year forward rate that should prevail?

F=S\*(1+π$)/(1+π€)=1.6(1+2%)/(1+3%)=**1.5845**

Or (F-S)/S≈ π$-π€ F≈ (π$-π€)\*S+S =(2%-3%)\*1.6+1.6=**1.584**

1. (40 points) Suppose that the annual interest rate is 5% in the U.S. and 15.5% in the U.K. The spot exchange rate S($/£)= 1.25. Assume that the arbitrager can borrow up to $1,000,000 or £800,000.
2. If the one-year forward rate is F($/£)= 1.1494. What transactions will the arbitrager carry out? How much profit can the arbitrager make in terms of dollar? Discuss how IRP will be restored in this case.

The no arbitrage forward rate implied by IRP is F=S\*(1+i$)/(1+i£)=1.25\*(1+5%)/(1+15.5%)=1.1364, compare to the 1.1494, pound is overvalued and dollar is undervalued.

1. Borrow $1,000,000, repayment in one year will be $1,000,000\*(1+5%)=$1,050,000
2. Convert $1,000,000 to £800,000 at the spot rate
3. Lend £800,000 and the maturity value in one year will be £800,000\*(1+15.5%)=£924,000
4. Sell £924,000 forward at the forward rate F($/£)=1.1494 in exchange for $1,062,046 ($1,062,046=£924,000 \*$1.1494 /£)

Profit=$1,062,046-$1,050,000=**$12,046**

Following the arbitrage transactions described above,

The dollar interest rate will rise;

The pound interest rate will fall;

The spot exchange rate will rise;

The forward exchange rate will fall.

These adjustments will continue until IRP is restored.

1. If the one-year forward rate is F($/£)= 1.1236. What transactions will the arbitrager carry out? How much profit can the arbitrager make in terms of dollar? Discuss how IRP will be restored in this case.

The no arbitrage forward rate implied by IRP is F=S\*(1+i$)/(1+i£)=1.25\*(1+5%)/(1+15.5%)=1.1364, compare to the 1.1236, pound is undervalued and dollar is overvalued.

1. Borrow £800,000, repayment in one year will be £800,000\*(1+15.5%)=£924,000
2. Convert £800,000 to $1,000,000 at the spot rate
3. Lend $1,000,000 and the maturity value in one year will be $1,000,000\*(1+5%)=$1,050,000
4. Buy £924,000 forward at the forward rate F($/£)=1.1236 using $1,038,206 ($1,038,206=£924,000 \*$1.1236/£)

Profit=$1,050,000-1,038,206=**$11,794**

Following the arbitrage transactions described above,

The dollar interest rate will fall;

The pound interest rate will rise;

The spot exchange rate will fall;

The forward exchange rate will rise.

These adjustments will continue until IRP is restored.