

4. BANK SELLS SPOT JAPANESE YEN

Bank sells Japanese yen on LEFT

Ans: **263.15**

5. CUSTOMER BUYS SPOT SWISS FRANCS

Bank sells Swiss francs on LEFT

∴ Customer buys Swiss francs on LEFT

Ans: **3.30**

6. BANK BUYS JAPANESE YEN 2-M FORWARD

Bank sells Japanese yen on LEFT

∴ Bank buys Japanese yen on RIGHT

<u>ie</u> spot	263.25	
2-M	<u>+0.21</u>	dis
	<u>263.46</u>	

Ans: **263.46**

7. CUSTOMER BUYS DOLLARS TWO MONTHS FORWARD

Customer buys \$ at rate at which bank sells, ∴ on LEFT

<u>ie</u> spot	1.6325	
2-m	<u>(0.0135)</u>	pm
	<u>1.6190</u>	

Ans: **1.6190**

8. BANK SELLS DOLLARS TWO MONTHS FORWARD at 1.6190

9. BANK BUYS SWISS FRANCS THREE MONTHS FORWARD

Bank buys Swiss francs on RIGHT

<u>ie</u> spot	3.3075	
3-m	<u>(0.0150)</u>	pm
	<u>3.2925</u>	

Ans: **3.2925**

10. CUSTOMER SELLS JAPANESE YEN ONE MONTH FORWARD

Customer sells Yen at rate at which bank buys, ∴ on RIGHT

<u>ie</u> spot	263.25	
1-M	<u>+0.15</u>	dis
	<u>263.40</u>	

Ans: **263.40**

$$11. \quad \frac{1.6250 - 1.6325}{1.6325} \times \frac{12}{1} \times 100\%$$

$$= \quad - 5.51\% \text{ p.a.}$$

US\$ at premium

$$i_{\text{£}} > i_{\text{US\$}}$$

$$12. \quad \frac{1.6135 - 1.6335}{1.6335} \times \frac{12}{3} \times 100\%$$

$$= \quad - 4.90\% \text{ p.a.}$$

US\$ at premium

$$i_{\text{£}} > i_{\text{US\$}}$$

2. Currency Speculation

Blue Demon Bank expects that the Chinese currency (the renminbi) will depreciate against the dollar from its spot rate of \$0.15 to \$0.14 in 10 days. The following interbank lending and borrowing rates exist:

	Lending rate	Borrowing rate
US dollar	8.0%	8.3%
Chinese renminbi	8.5%	8.7%

Assume that Blue Demon Bank has a borrowing capacity of either \$10 million or 70 million RMB in the interbank market, depending on which currency it wants to borrow.

ANSWERS:

(a) Blue Demon Bank can capitalize on its expectations about the renminbi (RMB) as follows:

1. Borrow RMB 70 million

2. Convert the RMB 70 million to dollars:

$$\text{CNY } 70,000,000 \times \$0.15 = \$10,500,000$$

3. Lend the dollars through the interbank market at 8.0% annualized over a 10-day period. The amount accumulated in 10 days is:

$$\$10,500,000 \times [1 + (8\% \times 10/360)] = \$10,500,000 \times [1.00222] = \$10,523,333$$

4. Repay the RMB loan. The repayment amount on the renminbi loan is:

$$\begin{aligned} &\text{RMB } 70,000,000 \times [1 + (8.7\% \times 10/360)] \\ &= 70,000,000 \times [1.002417] = \text{CNY } 70,169,167 \end{aligned}$$

5. Based on the expected spot rate of \$.14, the amount of dollars needed to repay the renminbi loan is: $\text{RMB } 70,169,167 \times \$0.14 = \$9,823,683$

6. After repaying the loan, Blue Demon Bank will have a speculative profit (if its forecasted exchange rate is accurate) of:

$$\$10,523,333 - \$9,823,683 = \mathbf{\$699,650}$$

(b) Blue Demon Bank can capitalize on its expectations as follows.

1. Borrow \$10 million

2. Convert the \$10 million to renminbi (RMB):

$$\$10,000,000 / \$0.15 = \text{RMB } 66,666,667$$

3. Lend the renminbi through the interbank market at 8.5% annualized over a 30-day period. The amount accumulated in 30 days is:

$$\text{RMB } 66,666,667 \times [1 + (8.5\% \times 30/360)] = 66,666,667 \times [1.0071] = \text{RMB } 67,138,889$$

4. Repay the dollar loan. The repayment amount on the dollar loan is:

$$\$10,000,000 \times [1 + (8.3\% \times 30/360)] = \$10,000,000 [1.0069] = \$10,069,000$$

5. Convert the renminbi to dollars to repay the loan. The amount of dollars to be received in 30 days (based on the expected spot rate of \$.17) is:

$$\text{RMB } 67,138,889 \times \$0.17 = \$11,413,611$$

6. The profits are determined by estimating the dollars available after repaying the loan:

$$\$11,413,611 - \$10,069,000 = \mathbf{\$1,344,611}$$

NOTE: These profits are risky as they depend upon the bank's exchange rate expectations being fulfilled.

3. Bilateral currency arbitrage

Assume the following prices for the US dollar quoted against the New Zealand dollar:

	Bank X	Bank Y
Bid price of New Zealand dollar	\$0.401	\$0.398
Ask price of New Zealand dollar	\$0.404	\$0.400

Given this information, is locational arbitrage possible? If so, explain the steps that would reflect locational arbitrage and compute the profit from this arbitrage if you had \$1,000,000 to use. What market forces would occur to eliminate any further possibilities of locational arbitrage?

ANSWER:

Yes. One could purchase New Zealand dollars from Bank Y for \$0.40 and sell them to Bank X for \$0.401. With \$1 million available, 2.5 million New Zealand dollars could be purchased from Bank Y. These New Zealand dollars could then be sold to Bank X for \$1,002,500, thereby generating a profit of \$2,500.

Locational Arbitrage

1. Buy New Zealand dollars from Bank Y ($\$1,000,000/\0.4)	2,500,000
2. Sell New Zealand dollars to Bank X ($\text{NZ\$ } 2,500,000 \times \0.401)	1,002,500
US dollar profit ($\$1,002,500 - \$1,000,000$)	2,500

Market forces:

- *The demand for New Zealand dollars at Bank Y will force this bank's ask price on New Zealand dollars to increase.*
- *The sales of New Zealand dollars to Bank X will force its bid price down.*
- *Once the ask price of Bank Y is no longer less than the bid price of Bank X, locational arbitrage will no longer be beneficial.*