END OF CHAPTER EXERCISES

Chapter 11 : Foreign Currency Options

Financial Engineering : Derivatives And Risk Management

(Keith Cuthbertson, Dirk Nitzsche)

1. A US firm has to pay for imports from Germany of either € 2m or € 3m (depending on what has been delivered in the contract) in 6 months time. What are the advantages and disadvantages of hedging with futures or options?

2. Explain the key items in the following quotes taken from the *Wall Street Journal*.

   Philadelphia Exchange Options

£31,250 Brit Pound-cents per unit (19th August)			
Bpound	Strike	Calls (Sept)	Puts (Sept)
160.60	164	0.48	4.14

3. You are a US portfolio manager, holding €20m in stocks in 25 large European companies in 2000. You predict that the Euro is likely to fall over the next 6 months because of the ambiguous monetary policy statements of the new European Central Bank. You need a currency strategy that will be beneficial if your prediction is correct but will not lead to large losses if you are incorrect. Discuss the relative merits of using either an option or a futures contract to achieve your aims.

4. It is 12th December and a US producer expects to receive € 0.5milion from the sale of Barbie Dolls in Germany, and payment will arrive in March. The March-102 put contract on Euros has a premium of 6.0 (cents per Euro) and the current spot rate is 100 (cents per Euro). The contract size is € 62,500. What is the hedged position?

5. Swiss Franc (CHF) January-62 European call and put options have 6 months to maturity. The current spot rate is 64, the current US risk free rate is 6% p.a. and the Swiss rate is 3% p.a. (All currency quotes are in US cents per Swiss Franc). The volatility (σ) of the USD-CHF exchange rate is 20% p.a.
   (a.) Calculate the call and put premia (for these European options)
   (b.) What is the intrinsic and time value of the call ?
   (c.) What is the intrinsic and time value of the put ?

6. You are faced with the following quotes for calls and puts on the Philadelphia Stock Exchange on 26th September for sterling (GBP).

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B.Pound GBP	Strike Price	Calls (December)	Puts (December)
144	140	5.10	-
144	145	-	2.5

All quotes are in cents per £. The current spot rate is S = 144. Contract size = £31,250

(a.) Draw the payoff profile for the call and the put taken individually indicating the breakeven spot rate at expiry

(b.) Draw the payoff profile assuming you purchase one call and one put on sterling (clearly indicate how the key elements in the graph are calculated). If the spot rate at expiry is 150 what is the profit from the strategy ?

7. A US firm is bidding for a UK contract to supply Barbie (and Ken) dolls valued at £25m. The current spot and (3 month) forward rates are S = 165 and F = 162.4 cents per £. The 165-put is currently priced at P = 2.5 and the 160-call is priced at C = 5.1. Both options expire in 3 months, the contract size is £31,250 and the options are quoted as cents per £.

If the bid is successful the US firm will receive £25m in 3 months time. Clearly state the outcome for the US firm if it is

(a.) unhedged

(b.) hedged using forwards

(c.) hedged using options

when the bid is either "successful" or "unsuccessful". Possible outcomes for the spot price at expiry (in 3 months) are 168 and 150 cents per £.

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