Dear Students,

Thanks for asking these great questions! The answer to my question (what is a put) I you all got right: put is an option contract giving you the right to sell.

Here are the answers to your questions.

To buy and sell options do we need to contact the broker or can it be done from programs like Bloomberg?

Need to contact a broker ☹.

For the writer of the option whose profit is limited to the premium, it must be interesting to put such a premium value that he most likely doesn’t lose. So is the only possibility to gain the case in which something unexpected happens?

Yes, indeed, the price of the option is such so that the writer of the option will most likely not lose. To gain against in these circumstances one has to face an unexpected change.

If the spot rate is equal to the strike price in a long put, why would you exercise that option because although you are “at the money”, you still have losses because of the premium you paid for the option?

You are right, you are not going to exercise it. Actually, you are indifferent between exercising and not, since in both cases you have paid already the premium (the premium is due at the time the option is purchased)!

Could you explain how the premium is not necessarily revenue? I am not sure what you meant about the cost of replicating a portfolio? Does this have to do with Black-Scholes? I didn’t understand what you said about replicating a portfolio and the relation of this with premium you will receive when you write an option? What do you mean by the cost of replicating a portfolio is the premium when we are discussing “buyer of call”? Could you explain the concept of the option premium you gain as a writer, not being revenue in greater detail?

You see, the premium paid for buying an option is actually what the writer deems as a fair value to buy (in case of short call) or sell (in case of short put) the underlying asset (currency) to you. In other words, if you do not exercise it, and he has pocketed the premium, that does not mean he can save it! In fact, many option writers would continuously re-adjust their short option position, so that should the holder exercise, they can avoid huge losses. In fact, oftentimes, even though the options expire, the writer has spent the premium on replicating the payoff structure of the option throughout the life of the option! Maintaining a replicating portfolio is an expensive business!
How do you determine the exact price of an option?

Analysts who price the forex option look into the underlying currency interest rate, the US$ interest rate, the current spot rate, the volatility of this exchange rate, the time to maturity, and the strike price. These all enter the Black-Scholes option pricing equation, so that the analyst can obtain the price of the option.

Where can we see options that are “in the money “?

E.g. try Chicago Mercantile Exchange. Today’s (10/13) quotation on the Yen is $0.00918/ Yen (e.g. see http://www.xe.com/ucc/convert.cgi), however, the Nov’03 call option w/ strike $ 0.0091/ Yen is highly traded, and is at-the-money (why?).

I am confused about arbitrage strategy. I understand the concept of buy low/sell high. However for example .844/Euro vs. .90/Euro why is .844 low and .90 high? When needing $0.90/Euro as opposed to 0.844/Euro is actually paying higher for Euro (Dollar worth less)?

For Example…

- Suppose that:
  - you have $10 m.
  - Wish to speculate on Euro
  - $S = 0.885/ EUR, $F_{30} = 0.900/ EUR.

  - You expect $S_{30} = 0.844/ EUR (EUR depreciates).
  - Arbitrage strategy?

  - You expect $S_{30} = 0.944/ EUR (EUR appreciates).
  - Arbitrage strategy?

Okey, let’s go through the two arbitrages we set up in class ☺. Suppose that there is an expected depreciation of the Euro to $0.844/EUR (this is a depreciation of the Euro since now the Euro gets you only 84 cents). What is an arbitrage strategy? Sell the euro today @ $0.885/EUR and then in 30 days buy the Euro back at the lower price of $0.844/EUR. Is that the best you can do? Well, you can do better than that ☹. How? You can sell Euro forward @ $0.90/EUR instead of selling it today @ $0.885/EUR, to make a bit more. So:

1. Sell Euros 30-day forward (so obligation in 30 days to sell EUR 11,111,111.1)
2. At the end of the 30 days, buy these Euros spot (that is spend at the current spot rate $9,377,777.78)
3. At the end of the 30 days, sell euros forward to receive $10,000,000. The profit is then $10,000,000 - $9,377,777.78 = $622,222.22

Now, consider the second case. In this case, know that there is an expected appreciation of the EUR. What to do? The way to go, is to buy the Euro spot today @ $0.885/EUR and then in 30 days sell the Euros you got in the first step @ $0.944/EUR to reap a profit of ($0.944 - $0.885)/EUR per Euro. So,

1. Convert US$ to Euros @ current spot to get EUR 11,299,435.03 (you spent $10,000,000).
2. At the end of 30 days, convert back to US$ at spot rate, so you get $10,666,666.67.
3. Realized profit is $666,666.67.

I am confused about why you would buy the put option in the example on slide 19. Can you explain that again please? What effect does the put have on the appreciation/ depreciation of the yen?

I am confused about why you would buy the put option in the example on slide 19. Can you explain that again please? What effect does the put have on the appreciation/ depreciation of the yen?

Here is the slide you refer to 😊.

**For Example…**

- Suppose that:
  - You wish to speculate on fall of Yen vs. $.
  - Current $ = Yen 120/$ (or $.00833/Yen).
  - Maturity: 90 days.
  - Expected $s_{90} = Yen 140/$ (or $.00714).
- Two options available:

<table>
<thead>
<tr>
<th>Call on Yen</th>
<th>Put on Yen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strike:</td>
<td>Strike:</td>
</tr>
<tr>
<td>Yen 125/$</td>
<td>Yen 125/$</td>
</tr>
<tr>
<td>(or $.008/ Yen)</td>
<td>(or $.008/ Yen)</td>
</tr>
<tr>
<td>Premium:</td>
<td>Premium:</td>
</tr>
<tr>
<td>$.00046</td>
<td>$.00003</td>
</tr>
</tbody>
</table>

1. What option to buy?
2. Break even price on option of choice?
3. If $S = Yen 140/$, what is net profit?

So, suppose that you face the dilemma of choosing b/n a put and a call on the Yen. If you buy a put, you lock in the right to sell the yen @ $0.008/ Yen. If you buy the call, you lock in the right to buy the yen @ $0.008/ Yen. Now, you expect the dollar to appreciate, that is, the yen will be worth less cents, $0.00714/ Yen. So, which contract would you
buy? The put, of course 😊! Because, you lock in a rate of $0.008, which is higher than the expected rate of $0.00714/ Yen.

Who gets to write an option - only companies and banks? Or individuals do it too?

Companies, mutual funds, pension funds, investment banks, & commercial banks that have sufficient collateral value to guarantee the fulfillment of the short option obligation.

I once heard something about Warren Buffet exercising OTM options on silver market, do you know if this is true?

Nope, any ideas how can I check it? This is interesting, why would he reportedly try to do that?

You mentioned something about an insurance premium for an option on the graph on Market, Time, & Intrinsic Value (slide 21). Where is this area in the graph represented? How come at the money is at the strike price not at the breakeven price?

Ok, I have pasted the slide 21 graph below. I referred to the time value of the option as the insurance value. Think about it. What is the time value? The possibility that an out-of-money option going in the money – the longer the time to maturity the more likely is that some event could happen (e.g. a revaluation of the Chinese renminbi) that would bring a call option (giving right to buy) on the Chinese currency in the money. Alternatively, time value comes because an option in the money may actually go out of the money. Notice that in this case, you simply would not exercise the option (e.g. a put on Chinese currency). That is what I mean by insurance value – you lock in a stable rate plus some potential upside. Where in the graph? Well, basically the difference between the red line and the blue line – that is the time value (well, let us say we will call it time value from now on).
Now, how come that the at-the-money comes at the strike price, not at the break-even price? Well, by convention 😊. Here is the thinking about it. Suppose you have already paid the premium of the option and then you watch what is a good time to exercise. Of course, on the back of your mind you will always think “Gee, I paid so and so much for it, may I recover it?”, but this is not really your greatest concern – why did you in the first place buy the option? Usually for hedging. So to speak, the premium is an upfront cost, that you can not get back (via money back guarantee 😊), or so to speak a “sunk” cost, that is not as important when you take decisions on the option’s fate. So, why not call an at-the-money option the one where Spot=Strike?

Wouldn’t it make more sense if at the money is when the buyer of an option breaks even with premium.

I agree, but that is the convention 😊.

Would there be a situation where it could be strategically beneficial to exercise out-of-the-money call options? (i.e. potential to corner markets, short-term vs. long-term gains)

Sure, if the intent is to impact the volume of the trading in the underlying currency (or financial assets in general). The change in volume could, in its term, impact prices.

Does it ever make a sense to exercise an option when it is in the money but below the breakeven point?
It makes sense since you can recover at least some part of the cost of the option (the premium).

**Would a writer write both calls and puts because one will be in the money?**

An investor would consider writing both calls and puts in order to come with more sophisticated payoffs, such as a straddle, as we saw in the case of Nick Leeson. It is not necessary to write both call and put, because one of them will be in the money (if they are written with on the same underlying currency with the same strike price).

**Why are calls more expensive than puts (such as in the example given in class)?**

Calls are not always more expensive than puts. Usually call is more expensive than a put if, for the given strike price, the underlying currency is expected to appreciate (that is, increase in value).

**Can you go over the basis points system that’s not a Yen currency?**

Currency prices for the US dollar are usually expressed to four decimal points, hence a basis point is equal to 0.0001 of most currencies.

**Can we have a little longer to finish the quizzes?**

I would try to increase a bit more the time 😊.

**Would there be more short-term written options than long-term because of exchange rate risk (volatility)?**

Yes! The longer the maturity, the more expensive the option will be, so there may not be many investors willing to buy such an option.

**What is the minimum lot equivalent for buying an option? For stocks it is usually for block of 100 shares, what is it for FOREX?**

It is different for the different contracts. For example, the trading on the Philadelphia stock exchange for different currencies has the following contract sizes:
For more details, please check out the specific contracts at the Philadelphia Stock Exchange, [http://www.phlx.com/products/standard.html](http://www.phlx.com/products/standard.html)

What is the minimum number of options that an investor needs to buy? My question is – can one just buy one call or does one have to purchase options in batches?

One can purchase a single call, but it will be on a standardized amount of the underlying currency, as shown in the above answer.

Can you predict the movement of spot exchange rate by looking at difference in prices between put and call? Say, Put price > Call price, ergo bearish movement; or Call price > Put price, ergo bullish movement.

Yes.

You said that the company can hedge by buying an option. What happens with the company if the seller cannot deliver on contract?
Then the clearing house of the option exchange would go after him. Notice that the clearing house would honor the writer’s obligation, and then try to compensate itself from the pool of assets of the writer.