Replies, 10/20/03

Dear Students,

Thanks a lot for asking these great questions! The answer to my question (what is <u>matching</u> of cash flows & what type of exposure you can hedge with it?) is that matching of cash flows is offsetting an account receivable w/ debt in the same foreign currency, so that you can minimize the net forex exposure. It can be used to hedge an operating exposure.

Here are the answers to your questions.

For the option hedge in A/R do we compare at PV using discount rate of WACC? Because I thought you said FV in the slides for the premium?

That's right, we compare the future value of the money market hedge w/ the value of the forward market hedge, & w/ the future value of the option market hedge. In a quiz question, I would tell you to compare the FVs of the three contractual hedges.

When doing an A/R option hedge, why do you need to have high/ low bounds? Isn't the payoff = Strike Price x Premium x Volume anyway?

That's right, we do not need to have the high/low bounds, and the gross payoff in this case is indeed = to the Strike Price x Premium x Volume. However, you have to subtract from it the cost of the option.

Which type of hedge is used most in practice, a money market hedge, a forward hedge or an option hedge? Are forward market hedges the most common? Is this because it is usually the most conservative option?

Yes, forward market hedges are the most common. Why? Basically, they are most conservative and straightforward to handle.

Can you explain again why would you choose one kind of hedge over another? Is it by price or by strategy?

Let's consider an A/R. In this case, you wish to maximize the amount you would receive at maturity. So, you compare the receipts from a forward market hedge, a money market hedge, and the option market hedge. For example, in class we consider an A/R of 1,000,000 pounds (which for some strange reason I kept referring to as 1 billion pounds ⁽ⁱ⁾, for which I apologize). Now, lets compare the receipts from different hedges (slide 13). The receipts of the forward market hedge, as spelled in class, were \$1,754,000. The receipts of the money market hedge were \$1,772,605. The minimum receipts under an option market hedge was \$1,722,746. So which one to choose? The money market is the highest, but the option market hedge gives us an unlimited upside potential. So, if the tisk manager does not tolerate much risk, she would just take the money market hedge.

Let's consider now an A/P. In this case, we minimize the cost of such a payable. Take a look at the example in class (slide 16). We know that the payable under a money market hedge would

be (in future value) \$1,781,294. The payable under the option market hedge would be at the highest \$1,777,254, a little better than the money market. Finally, the payable under the forward market hedge would be \$1,754,000, which is the lowest of the three. So, which one to choose? If you are risk-tolerant, you might go for the option hedge, since it caps the payable, but allows for even lower cost of the payable, should the foreign currency (in which the payable is due) depreciate enough to make it worth not exercising the option. Otherwise, you simply pick the forward market hedge, as the cheapest hedge.

Transaction exposure – can we compare the PV of cost in determining which hedge we want to use? Pick the cheapest cost has to pay today.

I assume you refer to A/P. Yes you can compare the present value of the costs.

What exactly is WACC? With option hedge, what is WACC?

This is the weighted average cost of capital. Suppose Hewlett Packard has 40 % debt (on which they pay 7% interest) and they have equity 60% (the internal rate of return on which is, say, 12%). So, what is WACC in this case?

0.4 * 7 % + 0.6 * 12 % = 10 %.

Teaser question: can the WACC ever be negative??

What is the difference between a borrow rate and a lending rate? Aren't they the same thing?

Well, yes. The borrowing rate is the rate at which you get a loan in the foreign currency. The lending rate is the rate at which you loan your money, but I really mean invest/ deposit your money (only a bank allowed to loan money). So, let's say we will always use invest/ deposit as far as terminology goes.

#3 on the HW is what we covered in class today and I think the topics were covered a little too fast. Could you maybe give another example in the memo w/ a solution to it to better understand?

Sure, let's take the example from the sample questions for the quiz. So, here is the quiz question on hedging the account payable.

Oregon Scientific (OS) has signed a contract to purchase LCD panels from Germany for $\notin 1,300,000$. The purchase was made June, payment due 6 months later, in December. OS considers hedging its forex exposure. The following info is available.

- Spot exchange rate: \$0.89/€
- OS cost of capital is <u>12%</u>
- Euro 6-month <u>borrowing</u> rate is 9% (or 4.5% for 6 months)
- Euro 6-month <u>investment</u> rate is 7% (or 3.5% for 6 months)
- U.S. 6-month <u>borrowing</u> rate is 8% (or 4% for 6 months)

- U.S. 6-month <u>investment</u> rate is 6% (or 3% for 6 months)
- Dec. call option w/ strike price $\frac{\$.90}{0}$, premium is $\frac{2\%}{0}$
- Dec. put option w/ strike price <u>\$.90</u>, premium is <u>1%</u>

So, let's set up <u>a money market hedge</u>. Invest $\frac{EUR1,300,000}{1+0.07 \times \frac{180}{360}} = EUR1,256,039$ into a money

market account in Euro to receive back in six month EUR 1,300,000. At the current spot rate, we need

 $EUR1,256,039 \times \$0.89 / EUR = \$1,117,874$. The cost of these funds being invested into a EUR deposit, rather than being used by the company as working capital for six months, is:

 $1,117,874 \times \left(1 + 0.12 \times \frac{180}{360}\right) = 1,184,947$. That is the cost of the money market hedge.

How can we set up an option market hedge? Since we have an account payable, we need to obtain a call option on the EUR. The available call option is with a strike price of \$0.90/EUR with premium of 2%. So, what is the cost of this and hedge? $EUR1,300,000 \times 0.02 \times \$0.89 / EUR = \$23,140$, i.e. the premium of 2% times the current notional value of the contract. This is a present value cost of the option. In terms of a future value, we can use the cost of capital, 12% per annum, or 6% for six months, to carry this option premium six months forward, $$23,140 \times 1.06 = $24,529$. So, if we were to exercise the call option the total maximum expense that we have locked in to pay:

EUR 1,300,000 x \$.90/EUR + cost of option= \$1,170,000 + \$24,529 = \$1,194,529.

The call option would be exercised if the appreciation of the EUR is high enough, i.e. above the strike of \$0.90/EUR.

Finally, suppose that the 6-month forward rate is \$0.90/EUR. To set up <u>a forward market</u> <u>hedge</u> we need to buy forward EUR 1,300,000 @ \$0.90/EUR for a total cost of \$1,170,000.

Now, let's compare the future values of the three hedges of the account payable. The cost of the forward market hedge is \$1,170,000. The cost of the money market hedge would be \$1,184,947. The maximum cost under an option market hedge is \$1,194,529. This suggests that perhaps a forward market hedge is the cheapest hedge of all three available.

In the problem set, question 3, you stated that Plasti-grip could invest at the rates given above or borrow at 2% per annum above those rates. What is the significance of that 2% and under what circumstances would it be used?

The 2% is to be used to figure out the exact borrowing rate. When would you use this rate? If you need to set up a money market hedge on an A/R, you would need to borrow the foreign currency, at the borrowing rate. Now, Plasti-grip has an A/P so, if they are to set up a money market hedge, they will need to use the investment rate in Korea, 16%, rather than the borrowing rate in Korea, which in this case is 18%.

In an option market hedge, we come up w/ a total cost for the strategy. In essence, is it correct that the strategy could cost a lot less if the call expired (spot<strike) plus you end up just paying the amount you owe in the market at a lower price?

I assume you refer to an option market hedge on an A/P. Yes, that's right, if the currency of the payable depreciates enough in terms of US\$, so that there is no point exercise the call option, then you can end up paying the payable at a lower \$ price.

What will be the chapters/ topics covered in Quiz 3? Will chapter 7 be covered?

Quiz 3 will cover the second part of chapter 7 (starting w/ the types of options) and chapter 8. I have put greater detail on that in the review for quiz 3.

According to the syllabus we are supposed to be covering chapter 11 – we are as you know on 8-9. Are you going to be revising the syllabus because things are getting confusing? Also what are we expected to know for quiz 3? Hedging strategies are going to be difficult to ask without notes.

I am re-drafting the syllabus for the second part of the course. Basically, I will cut down on two topics that I believe are well known to you, so that we could spend more time on two of the topics of highest interest – international mergers and acquisitions, and I hope we get time to speak at least a little bit about international portfolio diversification.

This is a question from the last replies that we didn't answer.

You said in the example about good CG that the company had a separate CEO and chairman and that was one of the main reasons they had good CG – however it is common in the US for the CEO to be chairman as well – what do you make of that?

(Heidi's reply. Thanks, Heidi!) Here are some articles relating to the question about a separation of CEO and Chairman of the Board...although many US companies do not separate these, there is a great debate as to if they should be separate (especially with Sarbanes-Oxley). To note: many European, Canadian, and British companies <u>do separate</u> the roles of CEO and Chairman.

http://www.businessweek.com/magazine/content/02_45/b3807036.htm

<u>http://www.ctnet.com/practices/board/cbm2-03.asp</u> -** good case study/analysis (gives each side's point of view), McKinsey study found that 69% backed this separation (89% from website survey).

http://www.twincities.com/mld/twincities/business/columnists/5133723.htm http://www.msnbc.com/news/857171.asp\?cp1=1

http://www.protiviti.com/knowledge/current_feature/041703.html

<u>http://www.forbes.com/2003/01/09/cx_pp_0109separate.html</u> --this site gives you a list of largest Fortune 500 companies in the US where there are separate CEO and Chairman.