FIN 512 Financial Derivative

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Question One:

For the interest swap in UK (Use N to denote the notional principal in pound):

$$v_1 = N(\sum_{t=1}^{3} 4.85\% \times e^{-r_{uk}t} - \sum_{t=1}^{3} i_{f_{uk}t} \times e^{-r_{uk}t})$$

where r_{uk} is the risk free rate of the UK, r_{uk}=4.42%. $i_{f_{uk}t}$ is the float LIBOR rate for time t (in the UK). 12-month LIBOR rate from 2006~2008 is 5.051%, 6.08%, 5.645%, respectively.

For the interest swap in US (Use M to denote the notional principal in US dollar):

$$v_2 = M(\sum_{t=1}^{3} 5.1\% \times e^{-r_{us}t} - \sum_{t=1}^{3} i_{f_{us}t} \times e^{-r_{us}t})$$

where r_{us} is the risk free rate of the US, r_{us}=4.43%. $i_{f_{us}t}$ is the float LIBOR rate for time t. 12-month LIBOR rate from 2006~2008 is 5.325%, 5.124%, 3.089%, respectively.

For the pound-dollar currency swap (denoted in pound):

$$v_3 = -N\sum_{t=1}^{3} 4.85\% \times e^{-r_{uk}t} + \frac{M}{s_0}(\sum_{t=1}^{3} \frac{5.1\% \times e^{-r_{us}t}}{s_1})$$

Where s_0 stands for the current exchange rate, s_0=1.80 dollar/pound; s_1 stands for the swap exchange rate, s_1=1.75 dollar/pound.

Finally, the total cost=$v_1 + v_2 + v_3 = 0.0419N$, which is 419bps.

Question Two:

Since the overweight in the British asset and underweight of US asset, Grosvenor will try to figure out a way to sell British and buy US. One way to finish this transaction is by doing the swap exchange shown in the case, another way is to directly do the same thing in the physical property market. If we have to finish this reallocation, there are several things we need to think about that might influence our final decision.

We should consider about the illiquidity of the physical property. It is not like stocks or other financial derivatives that we can trade fast and freely everyday. We have to find a buyer who is willing to buy our asset, then wait him to transfer the money and sign mountains of paper. This process will definitely be time-consuming. Besides time, as shown in the case, brokerage commissions and taxations will also cost you a lot of money to complete the transaction. For every 100 million dollars, you need to pay 2.25+0.15+100*0.005=2.9 million dollars fees to different advisors and department. This is much higher than the transaction cost of swap exchange.

In a conclusion, based on the number we calculated and shown above, the swap exchange will have more benefits than physical exchange, according to the money and time cost. However, if we put the real financial environment into consideration, if we spent several months to sell our physical assets in UK in 2006, and got all our cash in at the beginning of 2007. Since it will also take us few months to buy and sigh all the paper work in US to buy physical assets, and if we wait until the August, 2007, everyone know what happened at that time. The whole financial market is under a deep depression, and so is the housing market. This means if we hold the cash in our hand in 2007, we can buy double or even triple amount of physical assets in 2006, which is a great benefit for Grosvenor. But the problem is, no one can predict how to financial market will go in 2007. The more rational choose would still be the swap exchange in 2006.

Question Three:

If such REITs do exist, we believe they will help us reduce the transaction cost during the swap exchange. Here are the steps we are considering to make it work in the perfect market:

1. We can short certain amount of stocks in UK, to get around 100 millions pounds cash.
2. Use these 100 million pounds in exchange for US dollars, suppose the currency exchange rate is 1.8.
3. Use such amount of money to long US REITs stock.

Using this method, we will be able to completely mirror the transaction of using swap exchange, with even lower transaction cost. This is a huge benefit we can get comparing to the swap exchange.

However, in the real market, such behavior might not work that well. Since first of all, if you want to short 100 million pounds of stock, not every company can borrow you such big amount of stock. Secondly, if you want to sell that great deal of stock, you will definitely influence the price of stock, which may not be able to perfectly mirror the UK Annual Index any more. Last but not the least, the currency exchange rate will also be influenced by such amount of money in the market.

But still, having that kind of stock in the market will never be a bad thing, at least it will help to complete the market. And as for our decision, if such stock does exist, we will have a high possibility to use it to complete our transaction.