**Financial Risk Management (FRM)**

**ID: 13251**

**Q1.**

**Sol:**

Interest rate for 1 and 5 year discount bond: 12% and 8%

Maturity of 1-year discount bond: $2200

Maturity of 5-year discount bond: $3221.02

Now,

For 1-year at 12% = 2200/1.12 = 1964.28

For 1-year at 8% = 2200/1.08 = 2037.03

Now,

For 5-year at 12% = 3221.02/(1.12)^5 = 1827.69

For 5-year at 8% = 3221.02/(1.08)^5 = 2192.21

**Q3.**

**Sol:**

Step 1:

Year Payment Present value by 1%

1 1 0.99

2 1 0.980

3 1 0.97

4 1 0.96

5 101 96

Step 2:

Relative value = PV of payment/value

Year Payment present value of payment PV/value (e.g 0.99/100)

1 1 0.99 0.0099

2 1 0.98 0.0098

3 1 0.97 0.0097

4 1 0.96 0.0096

5 101 96 0.96

PV Total = 100

Relative value = 1

Step 3:

Year Relative value Relative Value x Years (e.g 1x0.0099)

1 0.0099 0.0099

2 0.0098 0.0196

3 0.0097 0.0291

4 0.0096 0.0384

5 0.96 4.80

Effective Maturity = 4.897

**Q4a:**

The expert system analysis is the secure process of financing anything that’s why banks still follow this process. By following expert system analysis, banks come to know about the character of the borrower that he/she has the ability to repay the loan or not. They check the credit history of borrower through different sources. Let’s take an example of building loan:

In a house building loan, the banks first sign an agreement of land to make themselves secure by taking half share in the land or HPA. After this, the banks check for the credit history of the borrower, the income, know about his/her business.

Another example can be of gold loan: Banks take gold from the borrower and the amount is given 25% less of the value of the gold. E.g the value of gold is 100 rupees in the market so, the bank will offer 75 rupees to the borrower.

**Q4c:**

The farmer will not enter in the short forward contract because the future contract is not appropriate and the weather creates uncertainty about the volume of crops. For example

If the weather is n-conditional or the weather is un-certain, and the production of crops is less than expected. The other farmers will be affected same. The overall production of corn will be low and the price of corn will become high.

The farmer’s problem arising from the bad harvest will be made worse by losses on the short future position. This problem emphasizes the importance of looking at the big picture when hedging. The farmer is correct to question whether hedging price risk while ignoring other risks is a good strategy.

**Q4b:**

Standardized rating approach for credit risk analysis lending fully secured by mortgages on residential property are risk weighted at 35% is because a residential property occupied by the browser or on rent is easy to be acquired in response of failure of credit return. The residential property is more secure than the commercial or real estate mortgaging. For example risk weight is 35% which means the banks have to set aside its own capital of at least 9% of 35%. Eg total loan is 100 so 35% will be 65 rupees and 9% of 65 rupees is 5.85. The Bank will have to set aside 5.85 to be on the safer side.

Now, standardized rating approach for credit risk analysis lending fully secured by mortgages on commercial property are risk weighted at 100% because of troubled asset in banking industry over the past few decades, the Basel committee holds to the view that mortgages on commercial property do not in principle, justify other than a 100% weighting of the loans secured and its very difficult for banks to vacate commercial properties so their risk is weighted 100% by Basel committee.

For example if the risk weight is 100% and the bank offers 100 rupees to borrower so, the bank will keep 9 rupees aside on the total capital.

**Q2a:**

Following are some reasons why long-term bonds are subject to greater interest rate risk than short-term bonds:

1. Long term bonds have a greater duration than short-term bonds. Duration measures the sensitivity of a bond’s price change in interest rates. For example:

A bond with duration of 6 will lose $6 for every 1% increase in rates. Because of this, a given interest rate change will have a greater effect on long-term bonds then on short-term bonds.

The concept of duration can be difficult to conceptualize but just think of it as the length of the time that the bond will be affected by interest rate change. Let’s suppose interest rate rise today by 25%. A bond with only one coupon payment left until maturity will be under paying the investor by 25% for only one coupon payment. On the other hand a bond with 20coupon payments left will be underpaying the investor for a much longer period. This difference in remaining payments will cause a greater drop in a long-term bonds price that it will in a short-term bonds price when interest rate rise.

1. There is a greater probability that interest rate will rise within a longer time period than within a shorter period. As a result, the investors who buy long-term bonds but then attempt to sell them before maturity may be faced with a deeply discounted market price when they want to sell their bonds. With short-term bonds, the risk is not as significant because interest rates are less likely to substantially change in the short –term. Short-term bonds are also easier to hold until maturity, thereby alleviating on investor’s concern about the effect of interest-rate driven changes in the price of bonds.
2. Long term bonds are more sensitive to interest rate changes. The reason lies in the fixed-income nature of bonds. For example when an investor purchases a corporate bond, for instance, they are actually purchasing a portion of a company’s debt. This debt is issued with specific details regarding periodic coupon payments, the principle amount of the debt and the time period until the bond’s maturity.

**Q2b:**

**Sol:**

From formula: Nf = Qs/Qf x delta S/delta F

Putting values: 1500/200 x (0.70/1)

= (7.5) x .7

= 5.25

As we are using a long hedge in cash market. Using a risk minimizing hedge means that we should take part in short position in future market.