**Iqra National University**

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**Department :** Business Administration

**Subject :** Financial Risk Management

**Assignment** : Final Term Final Assignment

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**Question No.1** Suppose interest rate initially is 10 percent across all maturities. A one-year discount bond pays $2200 at maturity. A five-year discount bond pays $3221.02 at maturity. Calculate the present value of both discount bonds if (a) interest rate rises to 12 percent (b) falls to 8 percent. (10 marks)

**Requirements:**

* Interest rate rises to 12%
* Falls to 8%.

**Solution:**

One year discount bond paying = $2200

Five Year discount bond = $3221.02

At 12%

1 Year Bond Present Value = $2200/ (1.12) = 1964.285

5 year Bond Present Value = $3221.02/ (1.12) ^5 = 3221.02/1.76234 = 1827.69

At 8%

1 Year Bond Present Value = $2200/ (1.08) = 2037.037

5 year Bond Present Value = $3221.02/ (1.08) ^5 = 3221.02/1.4693 = **2192.213**

**Question #2. (A)** Will the duration of a risky bond shorter or longer than less risky bonds? Also, will prices of risky bonds fluctuate more or less in comparison to less risky bonds? Briefly explain your answer and provide the reason. (5 marks)

**Answers**:
Long-term bonds have a greater duration than short-term bonds. Duration measures the sensitivity of a bond's price to changes in interest rates. For instance, a bond with a duration of 2.0 will lose $2 for every 1% increase in rates. Because of this, a given interest rate change will have a greater effect on long-term bonds than on short-term bonds. This concept of duration can be difficult to conceptualize but just think of it as the length of time that your bond will be affected by an interest rate change.
 For example, suppose interest rates rise today by 0.25%. A bond with only one coupon payment left until maturity will be underpaying the investor by 0.25% for only one coupon payment. On the other hand, a bond with 20 coupon 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 bond's price than it will in a short-term bond's price when interest rates rise.

**(ii)**
There is a greater probability that interest rates will rise (and thus negatively affect a bond's market price) within a longer time period than within a shorter period. As a result, 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, this 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 an investor's concern about the effect of interest rate-driven changes in the price of bonds.

**(B)** Suppose you are long 1500 oz. of silver in the cash market. There are 200 oz. of silver per futures contract. For every $1.00 change in the futures price, the cash market changes by $0.70. You want to engage in a risk minimizing hedge. What position should you take in the futures market and why? Give reason. How many contracts should you use? (5 marks)

NF = Qs/Qf x ∆s/ ∆F NF = 1500/ 200 x .70/1.0

NF= (7.5) x .70 **NF= 5.25**

Because we are using a long hedge In case Market, using a risk management hedge mean that you should take part in short position in the future market.

**Question #3.** Calculate the effective maturity/ duration of a five-year 1 percent coupon bond with a face value of $100. (15 marks)

**Step# 1**

**Year Payment Present Value at 1%**

1 $1 .9900

2 $1 .980

3 $1 .97059

4 $1 .96098

5 $101 96.098

**Step# 2**

**Year Payment Present Value at 1% Relative Value = Present Value / 100**

1 $1 .9900 .0099

2 $1 .980 .0098

3 $1 .97059 .0097059

4 $1 .96098 .0096098

5 $101 96.098 .096098

**Step#3**

**Years Relative Value Year X Relative value**

1 0.0099 .0099

2 .0098 .0196

3 .0097059 .0291177

4 .0096098 .0384392

5 .096098 .4.8049

**Total 4.9019**

**The Effective Maturity of Five-Year 1% Coupon-Bond is 4.9019 Years**.

**Question #4**.
(A) Despite some major shortcomings of expert system of credit risk analysis, why do banks still use it? Briefly explain with the practical example of a bank using it for credit risk analysis. (2+3=5marks)

(B) Why does in standardized rating approach for credit risk analysis lending fully secured by mortgages on residential property are risk weighted at 35% while mortgages on commercial real estate are risk weighted at 100%? Briefly explain the reasons. (5 marks)

©. A corn farmer argues "I do not use futures contracts for hedging. My real risk is not the price of corn. It is that my whole crop gets wiped out by the weather." Discuss his view point. Should the farmer estimate his or her expected production of corn and hedge and try to lock in a price for expected production? Briefly explain your answer. (5 marks)

**Answers:**

**Part (A)**

In expert System the credit decision is left to be taken by branch lending officer and he grand credit on the basis of his expertise, subjective judgment and weighting other certain key factors.

Despite of Major Short Comings Banks are still using it because the branch lending officer of that specific area is well aware of his customers and the area and he better can evaluate the riskiness of the credit to be granted.

Example:
United Bank using expert system to grant credit in which their credit risk officer after evaluating each and everything grant the loan.

**Part (B)**
Standardize Rating approach weight the loan secured by mortgages on residential property at 35% because a residential property occupied by the browser or on rent is easy to be acquired in response of failure of credit return but on the contrary the commercial property has been a recurring cause of troubled asset in banking industry over the past few decades, the Basel Committee holds to the view that mortgages on commercial real estate do not, in principle, justify other than a 100% weighting of the loans secured and it’s very difficult for banks to vacate commercial properties so their risk is weighted 100% by Basel committee.

**Part (C)**

If weather creates a significant uncertainty about the volume of corn that will be harvested, the farmer should not enter into short forward contracts to hedge the price risk on his or her expected production. The reason is as follows. Suppose that the weather is bad and the farmer’s production is lower than expected. Other farmers are likely to have been affected similarly. Corn production overall will be low and as a consequence the price of corn will be relatively high. The farmer’s problems arising from the bad harvest will be made worse by losses on the short futures 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.