END OF CHAPTER EXERCISES

Chapter 9 : Bond Market Strategies

Investments : Spot and Derivatives Markets

(Keith Cuthbertson, Dirk Nitzsche)

1. Give two reasons why the concept of duration is useful

2. What is meant by the convexity of a bond ? Why might you be willing to pay more for bond-A which has a greater convexity than bond-B.

3. Why might a pension fund use cash flow matching? Will it use this technique for the whole of its bond portfolio ?

4. Consider a 10 % coupon bond (annual coupons) with par value $100, yield to maturity of y = 10 % and 5 years to maturity. Calculate:
   (a.) the current market price, P.
   (b.) the Macaulay duration, D.
   (c.) the (approximate) price change if the yield to maturity rises to 10.5 % or falls to 9.5%.
   (d.) the 'true' price change for y = 10.5% and y = 9.5%.

5. What conditions are necessary to ensure a successful immunisation strategy ? Are these conditions met in practice?

6. What are the difficulties implementing a bond indexing strategy ?

7. <u>Portfolio A:</u> 1-year discount bond, face value = $2,000
   10-year discount bond, face value = $6,000
   <u>Portfolio B:</u> 5.95 year discount bond, face value = $5,000

   Current flat yield curve is y = 10% pa (continuously compounded)

   (a.) Show that the duration of portfolio-A equals that of portfolio-B
   (b.) What is the actual percentage change in value of portfolio-A for a 10-basis point increase in yield?
   Does the duration formula give approximately the same answer?
   (c.) Repeat (b.) for portfolios A and B for an increase in yield of 5% pa.
   Which portfolio has the higher convexity?

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