## Chapter Twelve

## Futures Contracts and Portfolio Management

# **Multiple Choice**

* 1. Immunization strategies deal mostly with \_\_\_\_\_\_\_\_\_\_\_\_\_.
     1. credit risk
     2. market risk
     3. convenience risk
     4. interest rate risk

ANSWER: D

* 1. In a bullet immunization application, the manager seeks to get \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_to cancel.
     1. interest rate risk, reinvestment rate risk.
     2. interest rate risk, default risk.
     3. convenience risk, price risk.
     4. reinvestment rate risk, default risk.

ANSWER: A

3. A bank's funds gap equals

a. the extent to which asset duration exceeds liability duration.

b. total assets minus total liabilities.

c. total assets minus current liabilities.

d. rate sensitive assets minus rate sensitive liabilities.

ANSWER: D

4. Banks usually make duration adjustments by

a. altering the left side of the balance sheet.

b. altering the right side of the balance sheet.

c. altering both sides of the balance sheet.

d. altering only the equity account.

ANSWER: A

5. Disadvantages of immunization include all of the following *except*

a. the opportunity cost of being wrong.

b. it only works for long‑term investment horizons.

c. transactions costs.

d. it reduces the portfolio yield.

ANSWER: B

* 1. The two main types of duration matching are

a. horizon matching and rate matching.

b. bullet immunization and bank immunization.

c. duration immunization and bond immunization.

d. gap matching and direct immunization.

ANSWER: B

* 1. Two key factors in bullet immunization are

a. present value of outflows and their duration.

b. future value of outflows and one minus their duration.

c. the cheapest to deliver bond and its duration.

d. implied interest rates and convexity.

ANSWER: A

* 1. Bank immunization is concerned with bank

a. assets only.

b. liabilities only.

c. assets and liabilities.

d. budgets.

ANSWER: C

* 1. Duration is reduced by \_\_\_\_\_ coupons and \_\_\_\_\_ maturities.

a. raising, lengthening

b. raising, reducing

c. lowering, lengthening

d. lowering, reducing

ANSWER: B

* 1. The basis point value is the change in

a. bond price for a one basis point change in yield to maturity.

b. bond price for a one point change in yield to maturity.

c. bond yield for a one percent change in bond price.

d. bond yield for a one basis point change in bond price.

ANSWER: A

* 1. Basis point value may be a function of all of the following *except*

a. duration.

b. portfolio size.

c. conversion factor.

d. beta.

ANSWER: D

* 1. A characteristic of most portfolio immunization strategies is

a. reduced portfolio yield.

b. increased portfolio interest rate risk.

c. increased portfolio reinvestment rate risk.

d. lower transaction costs.

ANSWER: A

* 1. A strategy to take advantage of anticipated changes in world uncertainty is the \_\_\_\_\_\_\_ spread.

a. TED

b. NOB

c. LED

d. MOB

ANSWER: A

* 1. The NOB spread is used by individuals anticipating

a. a decline in interest rates.

b. a rise in interest rates.

c. a parallel shift in the yield curve.

d. a change in the slope of the yield curve.

ANSWER: D

**Short Answer/Problem**

* 1. Suppose you can earn 6% riskfree forever. You will need $100,000 in 12 years. A hypothetical riskfree zero coupon bond will "bullet immunize" this cash requirement.

a. What should the market price of this bond be?

b. What should the duration of this bond be?

c. What should the yield to maturity of this bond be?

ANSWER:

*a. $49,697*

*b. 12*

*c. 6%*

* 1. A bank has interest sensitive assets of $567 million; its interest sensitive liabilities are $233 million, with a duration of 5.56 years. What should the duration of the interest sensitive assets be in order to immunize the bank's portfolio?

ANSWER:





DA = **2.28**

* 1. Given the following data:

Portfolio par value = $75 million

Price of bond portfolio = 94% of par

Duration of bond portfolio = 11.50

Yield to maturity of bond portfolio = 7.75%

Price of selected futures contract = 97 % of par

Duration of cheapest to deliver bond = 9.00

Yield to maturity of cheapest to deliver bond = 7.95%

Price of cheapest to deliver bond = 100%

CBT correction factor for cheapest to deliver bond = 0.9200

What is the appropriate hedge ratio?

ANSWER:

*****1.14***

* 1. In Problem 3, suppose the task is to hedge 75% of a $100 million bond portfolio. How many of the indicated T‑bond futures contracts should be used?

ANSWER:

**570**

* 1. What is the basis point value of the bond portfolio in Problem 3?

ANSWER:

$78,122.08

* 1. What is the basis point value of the cheapest to deliver bond in Problem 3?

ANSWER:

**$0.94**

* 1. Suppose you wanted to increase the duration of the bond portfolio in Problem 3 to 13.00. How many of the indicated futures contracts would be necessary?

ANSWER:





*BPVfutures* = $0.94 x 100 = $94.00

= 107.54 🡪 **107 or 108 contracts**

* 1. *Include a current Wall Street Journal listing.* Listed below are summary statistics on a U.S. Treasury bond portfolio:

**par value market value duration**

$12,000,000 $10,100,000 10.55

If the cheapest to deliver bond sells for $980and has a duration of 12.0, how many "next March" Treasury bond futures must be bought or sold in order to hedge the entire portfolio?

ANSWER: Individual student response.

* 1. What role does the duration statistic play in hedging with interest rate futures?

ANSWER: Duration measures the interest rate risk contained in the portfolio. Knowing this statistic enables the portfolio manager to determine the “magnitude” of hedge needed to alter the portfolio risk as desired.

* 1. While reviewing some reference material, your supervisor finds the following statement: “While both stock index futures and put options can be used to reduce the risk of a stock portfolio, futures contracts are cheaper to use. The trade-off is between the option premium and the symmetric/asymmetric return distributions.”
     1. Explain why a futures contract might be a cheaper means of reducing portfolio risk than using put options.
     2. Explain how the return distribution of a stock portfolio hedged with index futures differs from the return distribution of a stock portfolio hedged with put options.

ANSWER:

* + - 1. You pay a premium for put options, but not for futures contracts.
      2. *Futures returns are symmetric; protective puts are not. With a protective put you have transferred the portion of the return distribution that contains large losses.*
  1. You manage a portfolio that is currently 75% stock, 25% bonds. You determine that 300 S&P 500 stock index futures would completely hedge the stock portion of the portfolio, and that 100 T-bond futures would completely hedge the bond portion. At present, you have no open futures positions. You decide to change your asset allocation to 50% stock, 50% bonds. Calculate the number of contracts of each type of futures contract you would buy or sell (state which) in order to achieve the desired mix without changing the underlying portfolio.

ANSWER:

*Stock: From 75% to 50% is a one-third reduction, so use 300/3 = 100 futures.* ***Sell 100 SPX futures***

*Bonds: from 25% to 50% is a 100% increase.* ***Buy 100 T-bond futures***