Portfolio Management

2010-2011

Question 1

a) Why would a portfolio manager be willing to assume the credit risk of a bond or an issuer?

b) Explain the relationship between credit spread risk and downgrade risk.

c) If a portfolio manager wants to estimate a portfolio's credit spread risk exposure what analytical measure can be used?

d) Explain the risk exposures the total return receiver accepts in a total return swap?

e) Why is a total return swap more transactionally efficient than cash market transactions to obtain exposure to a diversified portfolio of corporate bonds?

f) How can a total return swap be used to short a corporate bond?

Question 2

John Smith is a fixed income portfolio manager. His firm's credit research group has just released a credit report on XYZ Corporation. The credit research group feels strongly that within one year the firm's credit fundamentals will strengthen such that the market will demand a lower credit spread. Mr. Smith believes that the conclusion of the credit research group is correct.

Next week, XYZ Corporation will be coming to market with a 12-year senior bond issue at par with a coupon rate of 11%, offering a spread of 500 basis points over the 12-year treasury issue.

Rather than purchase the bonds, Mr. smith prefers to express his view on the company's credit risk by entering into a total return swap that matures in one year with the reference obligation being the senior bonds that will be issued by XYZ Corporation. The total return swap calls for an exchange of payments semiannually with the total return receiver paying the 6-month Treasury rate plus 250 basis points. The notional amount for the contract is $15 million.

Suppose that over the one year, the following occurs:

- The 6-month Treasury rate is 5% initially
- The 6-month Treasury rate for computing the second semiannual payment is 6%
- At the end of one year the 11-year Treasury rate is 6.5%
- At the end of one year the credit spread for the reference obligation is 350 basis points.

a) Would Mr. Smith enter the total return swap as the total return receiver or total return payer? Explain why.

b) What is the 12-year Treasury rate at the time the bonds are issued?

c) If at the end of one year the 11-year Treasury rate is 6.5% and the credit spread declines to 350 basis points, what will be the price of the reference obligation?

d) What is the cash flow paid for the year to the total return receiver assuming that the issuer makes the coupon payments?

e) What are the payments that will be made by the total return receiver?

f) What is the net payment made by the total return receiver?

Question 3

Mr. Mateus manages a corporate bond portfolio. He is interested in seeking credit protection for one bond issue in his portfolio, XYZ Senior Bonds that mature in 7 years. The par value of XYZ Senior Bonds in the portfolio is $25 million and the market value of the bond is 60.

Mr. Mateus is considering the purchase of a credit default swap with a schedule term of five years and with XYZ Senior Bonds the reference obligations. The swap premium is 600 basis points and the payments are made quarterly. This is the first time he is using a credit default swap and he has asked you the following questions:

a) What is meant by the credit default swap having a "schedule term of five years"?

b) How much should the notional value of the credit default swap be if he wants to protect the entire market value of XYZ Senior Bonds in his portfolio?

c) If the first quarter in which the swap premium must be paid has 90 days, how much will the payment be?

d) If a credit event occurs, what happens to the credit default swap after payment is received from the protection seller?

Solutions

Question 1

a) A portfolio manager may be willing to assume credit risk if he or she has a positive outlook for the bond or the issuer. The portfolio manager may believe that the bond or issuer will be upgraded, resulting in a favorable price performance relative to other credits. The portfolio manager may have an expectation of other credit events which may have a positive effect on the bond or issuer such as an advantageous merger or acquisition by a strong credit. Finally, there are times in the economic cycle where banks may be willing to provide term loans to high-yield companies at more attractive rates than the bond markets, resulting in the calling of an outstanding issue at a premium to par or market value and thereby enhancing return.

b) When there is an actual or anticipated downgrade of an issue or issuer, the market will require a higher spread. There is also a risk because credit spreads will likely widen before there is a downgrade – and they may widen without a downgrade occurring. Credit spread risk is the risk that the market will require a higher credit spread.

c) Spread duration can be used. It is the estimated change in the value of a portfolio for a 100 basis point change in the spread. Spread duration must be properly estimated to focus only on a spread change due to credit risk.

d) The total return receiver realizes the cash flow from the reference obligation or basket of reference obligations which includes the change in the market value. The change in the market value can be attributable to a change in both the credit spread and the level of interest rates. Consequently, there is exposure to interest rate risk as well as credit risk.

e) A portfolio manager seeking to a diversified portfolio of corporate bonds can purchase the individual bond issues in the market. This requires an upfront capital allocation and total transaction costs are relatively high. A more transactionally efficient way of realizing the total return from that diversified portfolio of corporate bonds is to enter into a total return swap as the total return receiver.

f) A portfolio manager who wants to short a corporate bond would find it difficult to do so in the corporate bond market. By shorting a corporate bond the portfolio manager pays the total return. The same can be accomplished by using a total return swap as the total return payer with the corporate bond that the portfolio manager seeks to short as the reference obligation.

Question 2

a) Since Mr. Smith expects the credit spread to decline, he will be the total return receiver.

b) Since the spread over the 12-year Treasury rate is 500 basis points and the bond is issued at par with a coupon rate of 11%, then the 12-year treasury rate is 6%.

c) The required market yield would be 10% for the reference obligation (6.5% plus 350 basis points). Thus the reference obligation would be priced as an 11-year 11% coupon bond trading at 10%. The price for this bond is 106.58 per 100 par value.

d) The total cash flow is:

Coupon payments total $1,650,000 (=11% × $15 million)

Change in market value:

Initial price:	$15,000,000
Market price one year later	$15,987,000 (=1.0658 × $15 million)
Capital appreciation	$987,000
Total swap payment to total return receiver	$2,637,000 (=$1,650,000 + $987,000)

e) The two payments are:

First swap payment paid: $15 million × 7.5%/2	= $562,500
Second Swap payment paid: $15 million × 8.5%/2	= $637,500
Total payments	= $1,200,000

f) Mr. smith, the total return receiver, will receive payments of $2,637,000 and make payments of $1,200,000. The net payment received is $1,437,000

Question 3

a) A "schedule term of five years" means that assuming the swap is not terminated as the result of a credit event prior to five years after the swap is initiated, then it is scheduled to terminate in five years.

b) Since the market is 60 per 100 par and the par value is $25 million, the market value of the bonds is $15 million and this is the notional amount for the swap.

c) The quarterly payment is determined as follows:

$$\text{Quarterly swap premium payment} = \text{notional amount} \times \text{swap premium (in decimal)} \times \frac{\text{actual no. of days in quarter}}{360}$$

Since the notional amount is $15 million and there are 90 actual days assumed in the quarter, then if the annual rate is 600 basis points (0.06), the quarterly swap premium payment made by the protection buyer would be:

$$\$15{,}000{,}000 \times 0.06 \times \frac{90}{360} = \$225{,}000$$

d) The swap is terminated and there are no more payments made by the protection buyer.