

UNIVERSITY OF BRADFORD

BOND MARKET ANALYSIS & CREDIT RISK

MAN4261M

09 May 2013

09:15 – 10:45 hours

Main

This is a **CLOSED BOOK** examination

Answer **ONE** question from Part A, **TWO** questions from part B, and **ONE** question from part C.

The **total** number of marks allocated to each part is given in the brackets below.
The exam is worth 100 marks in total.

SECTION A

Answer ONE question from this section.
All questions carry equal weighting.

1. Below are two portfolios with a market value of \$500 million. The bonds in both portfolios are trading at par value. The dollar duration of the two portfolios is the same.

Issue	Years to Maturity	Par Value (in millions)
<u>Bonds Included in Portfolio I</u>		
A	2.0	\$120
B	2.5	\$130
C	20.0	\$150
D	20.5	\$100
<u>Bonds Included in Portfolio II</u>		
E	9.7	\$200
F	10.0	\$230
G	10.2	\$ 70

Answer the below questions:

- (a) Which portfolio can be characterized as a bullet portfolio?
(5 marks)
- (b) Which portfolio can be characterized as a barbell portfolio?
(5 marks)
- (c) The two portfolios have the same dollar duration; explain whether their performance will be the same if interest rates change. Assume that interest rates for all maturities change by the same amount.
(10 marks)
- (d) The portfolio manager has an assumed six-month investment horizon. If the performance of the two portfolios is different, how would you go about determining which of the two performs better?
(15 marks)

(Total 35 marks)

2. Consider a semi-annual bond selling at par (\$100) with an annual coupon rate of 6% and 10 years to maturity.

(a) What is the price of this bond if the required annual yield (yield to maturity) is 15%?
(7 marks)

(b) What is the price of this bond if the required annual yield (yield to maturity) increases from 15% to 16%, and by what percentage did the price of this bond change?
(7 marks)

(c) What is the price of this bond if the required annual yield (yield to maturity) is 5%?
(7 marks)

(d) What is the price of this bond if the required annual yield (yield to maturity) increases from 5% to 6%, and by what percentage did the price of this bond change?
(7 marks)

(e) From your answers to parts (b) and (d) above, what can you say about the relative price volatility of a bond in a high-interest-rate environment compared to a low-interest-rate environment?
(7 marks)

(Total 35 marks)

SECTION B

Answer TWO questions from this section.
All questions carry equal weighting.

3. "If two portfolios have the same duration, the change in their value when interest rates change will be the same." Explain why you agree or disagree with this statement.

(Total 15 marks)

4. The following excerpt is taken from an article titled "Denver Investment to Make \$800 Million Treasury Move," that appeared in the December 9, 1991, issue of *BondWeek*, p. 1:

"Denver Investment Advisors will swap \$800 million of long zero-coupon Treasuries for intermediate Treasuries... The move would shorten the duration of its \$2.5 billion fixed-income portfolio..."

Answer:

Why would the swap described here shorten the duration of the portfolio?

(Total 15 marks)

5. Explain the main characteristics of structural corporate default models, and discuss their usefulness.

(Total 15 marks)

6. Explain how a rating transition matrix can be used as a starting point in assessing how a manager may want to allocate funds to the different credit sectors of the corporate bond market.

(Total 15 marks)

SECTION C

Answer ONE question from this section.
All questions carry equal weighting.

7. You are a financial consultant. At various times you have heard comments on interest rates from one of your clients. How would you respond to each comment?

(a) Respond to: "The yield curve is upward-sloping today. This suggests that the market consensus is that interest rates are expected to increase in the future."
(10 marks)

(b) Respond to: "I can't make any sense out of today's term structure. For short-term yields (up to three years) the spot rates increase with maturity; for maturities greater than three years but less than eight years, the spot rates decline with maturity; and for maturities greater than eight years the spot rates are virtually the same for each maturity. There is simply no theory that explains a term structure with this shape."
(15 marks)

(c) Respond to: "When I want to determine the market's consensus of future interest rates, I calculate the forward rates."
(10 marks)

(Total 35 marks)

8. Explain the main characteristics of the Jarrow-Turnbull-Lando corporate default model, and discuss how this model represents an improvement to the more basic Jarrow-Turnbull model.

(Total 35 marks)

9. Can you tell from the following information which of the following three bonds will have the greatest price volatility, assuming that each is trading to offer the same yield to maturity?

Be sure to address all factors that affect the price volatility in your answer. This may include the ones for which you are not given any values in the table below. (*Hint: Keep all other factors constant, and vary one each time in your analysis.*)

Bond	Coupon Rate (%)	Maturity (years)
X	8	9
Y	10	11
Z	11	12

(Total 35 marks)

10. The following is reproduced from the Prospectus of the T. Rowe Price Institutional Core Plus Fund dated October 1, 2010:

“Principal Investment Strategies: The fund intends to invest at least 65% of its net assets in a “core” portfolio of investment-grade, U.S. dollar-denominated fixed income securities which may include, but are not limited to, debt securities of the U.S. government and its agencies, corporate bonds, mortgages, and asset-backed securities. Normally, the fund will also maintain a “plus” portion of its portfolio in other sectors of the bond market, including high yield, non-U.S. dollar-denominated, and emerging market securities, to seek additional value.

Under normal conditions, the fund expects to maintain an effective duration within +/-20% of the Barclays Capital U.S. Aggregate Bond Index. As of July 31, 2010, the effective duration of this index was 4.05; however, it will change over time. The fund, in the aggregate, will seek to maintain a weighted average credit rating of A- or better, based on the weighted average credit quality of the fund’s portfolio securities.

Individual bond investments in the core portfolio will be investment grade, with a minimum credit quality of BBB-. Ratings will be as determined, at the time of purchase, by at least one nationally recognized statistical rating organization (NRSRO) or, if not so rated, a comparable rating by T. Rowe Price. If a security is split-rated (i.e., one rating below investment grade and one at or above investment grade), the higher rating will be used.

The plus portion of the fund’s portfolio may consist of below investment-grade (junk) bonds of U.S. and other developed country companies (not to exceed 20% of net assets), below investment-grade emerging market fixed income securities (not to exceed 10% of net assets), non-U.S. dollar-denominated securities (not to exceed 20% of net assets), and convertible and preferred securities (not to exceed 10% of net assets), as well as other investments. The fund may hold non-U.S. currencies without holding any bonds or other securities denominated in those currencies.

The fund may continue to hold an investment in its core portfolio that is downgraded to below investment grade after purchase. If such rating downgrades cause high yield exposure to exceed 20% of net assets or below investment-grade emerging market securities to exceed 10% of net assets, the fund will reduce exposure within a reasonable period of time.

In keeping with the fund’s objective, it may also use futures, options, and swaps. The fund may sell holdings for a variety of reasons, such as to adjust the portfolio’s average maturity, duration, or credit quality or to shift assets into and out of higher yielding or lower yielding securities or different sectors.”

Discuss in detail the strategy of this fund.

(Total 35 marks)