

DEBT SECURITIES, SEMESTER 1, 2012 – TUTORIAL 1

CHAPTER 1: FEATURES OF DEBT SECURITIES

Problem 1)

Consider the following bond issues.

Bond A: 5% 15-year bond

Bond B: 5% 30-year bond

Neither bond has an embedded option. Both bonds are trading in the market at the same yield.

Which bond will fluctuate *more* in price when interest rates change? Why?

Problem 3)

A floating rate issue has the following coupon formula:

1-year Treasury rate + 30 basis points with a cap of 7% and a floor of 4.5%

The coupon rate is reset every year. Suppose that at the reset date the 1-year Treasury rate is as shown below. Compute the coupon rate for the next year:

Date	1-year Treasury rate	Coupon rate
First reset date	6.1%	?
Second reset date	6.5%	?
Third reset date	6.9%	?
Fourth reset date	6.8%	?
Fifth reset date	5.7%	?
Sixth reset date	5.0%	?
Seventh reset date	4.1%	?
Eighth reset date	3.9%	?
Ninth reset date	3.2%	?
Tenth reset date	4.4%	?

Problem 6)

An assistant portfolio manager reviewed the prospectus of a bond that will be issued next week on January 1 of 2000. The call schedule for this \$200 million, 7.75% coupon 20-year issue specifies the following:

The Bonds will be redeemed at the option of the Company at any time in whole or in part, upon not fewer than 30 nor more than 60 days' notice, at the following redemption prices (which are expressed in percentages of principal amount) in each case together with accrued interest to the date fixed for redemption:

If redeemed during the 12 months beginning January,

2000 through 2005 104.00%

2006 through 2010 103.00%

2011 through 2012 101.00%

from 2013 on 100.00%

provided however, that prior to January 1, 2006, the Company may not redeem any of the Bonds pursuant to such option, directly or indirectly, from or in anticipation of the proceeds of the issuance of any indebtedness for money borrowed having an interest cost of less than 7.75%.

The prospectus further specifies that:

The company will provide for the retirement by redemption of \$10 million of the principal amount of the Bonds each of the years 2010 to and including 2019 at the principal amount thereof, together with accrued interest to the date of redemption. The Company may also provide for the redemption of up to an additional \$10 million principal amount...annually,...such optional right being non-cumulative.

The assistant portfolio manager made the following statements to a client after reviewing this bond issue. Comment on each statement.

- “My major concern is that if rates decline significantly in the next few years, this issue will be called by the Company in order to replace it with a bond issue with a coupon rate less than 7.75%.”
- “One major advantage of this issue is that if the Company redeems it *for any reason* in the first five years, investors are guaranteed receiving a price of 104, a premium over the initial offering price of 100.”
- “A beneficial feature of this issue is that it has a sinking fund provision that reduces the risk that the Company won't have enough funds to pay off the issue at the maturity date.”
- “A further feature of this issue is that the company can accelerate the payoff of the issue via the sinking fund provision, reducing the risk that funds will not be available at the maturity date.”

e. In response to a client question about what will be the interest and principal that the client can depend on if \$5 million par value of the issue is purchased, the assistant portfolio manager responded: “I can construct a schedule that shows every six months for the next 20 years the dollar amount of the interest and principal repayment. It is quite simple to compute – basically it is just multiplying two numbers”.

CHAPTER 2: RISKS ASSOCIATED WITH INVESTING IN BONDS

Problem 1)

For each of the following issues, indicate whether the price of the issue should be par value, above par value, or below par value:

	Issue	Coupon rate	Yield required by market
a.	A	5¼%	7.25%
b.	B	6⅝%	7.15%
c.	C	0%	6.20%
d.	D	5⅞%	5.00%
e.	E	4½%	4.50%

Problem 3)

- Short-term investors such as money market mutual funds invest in floating-rate securities having maturities greater than 1 year. Suppose that the coupon rate is reset everyday. Why is the interest rate risk small for such issues?
- Why would it be improper to say that a floating-rate security whose coupon rate resets every day has no interest rate risk?

Problem 4)

John Smith and Jane Brody are assistant portfolio managers. The senior portfolio manager has asked them to consider the acquisition of one of two option-free bond issues with the following characteristics:

- Issue 1 has a lower coupon rate than Issue 2
- Issue 1 has a shorter maturity than Issue 2
- Both issues have the same credit rating.

Smith and Brody are discussing the interest rate risk of the two issues. Smith argues that Issue 1 has greater interest rate risk than Issue 2 because of its lower coupon rate. Brody counters by arguing that Issue 2 has greater interest rate risk because it has a longer maturity than Issue 1.

- Which assistant portfolio manager is correct with respect to their selection of the issue with the greater interest rate risk?
- Suppose that you are the senior portfolio manager. How would you suggest that Smith and Brody determine which issue has the greater interest rate risk?

Problem 15)

Identify the difference in the major risks associated with the following investment alternatives:

- For an investor who plans to hold a security for one year, purchasing a Treasury security that matures in one year versus purchasing a Treasury security that matures in 30 years.
- For an investor who plans to hold an investment for 10 years, purchasing a Treasury security that matures in 10 years versus purchasing an AAA corporate security that matures in 10 years.
- For an investor who plans to hold an investment for two years, purchasing a zero-coupon Treasury security that matures in one year versus purchasing a zero-coupon Treasury security that matures in two years.
- For an investor who plans to hold an investment for five years, purchasing an AA sovereign bond (with dollar denominated cash flow payments) versus purchasing a U.S. corporate bond with a B rating.
- For an investor who plans to hold an investment for four years, purchasing a less actively traded 10-year AA rated bond versus purchasing a 10-year AA rated bond that is actively traded.
- For a U.S. investor who plans to hold an investment for six years, purchasing a Treasury security that matures in six years versus purchasing an Italian government security that matures in six years and is denominated in lira.

Problem 17)

- A treasurer of a municipality with a municipal pension fund has required that its in-house portfolio manager invest all funds in the highest investment grade securities that mature in one month or less. The treasurer believes this is a safe policy. Comment on this investment policy.
- The same treasurer requires that the in-house portfolio municipality's operating fund (i.e., fund needed for day-to-day operations of the municipality) follow the same investment policy. Comment on the appropriateness of this investment policy for managing the municipality's operating fund.