DEBT SECURITIES, SEMESTER 1, 2012 – TUTORIAL 7

CHAPTER 7: INTRODUCTION TO THE MEASUREMENT OF INTEREST RATE RISK

Problem 6)
Lewis Marlo, an assistant portfolio manager, was reviewing a potential buy list of corporate bonds. The list provided information on the effective duration and effective convexity adjustment assuming a 200 basis point change in interest rates for each corporate bond on the list. The senior portfolio manager, Jane Zorick, noticed that Mr. Marlo crossed out each bond with a negative convexity adjustment. When Ms. Zorick asked Mr. Marlo why, he responded that a negative value meant that the particular corporate bond was unattractive. How do you think Ms. Zorick should respond?

Problem 8)
Suppose that you are given the following information about two callable bonds of the same issuer that can be called immediately:

	Estimated percentage change in price if interest rates change by:	
	-50 basis points	+50 basis points
Bond ABC	+2%	-5%
Bond XYZ	+11%	-8%

You are told that both bonds have about the same maturity and the coupon rate of one bond is 7% and the other 13%. Suppose that the yield curve for this issuer is flat at 8%. Based on this information, which bond is the lower coupon bond and which is the higher coupon bond? Explain why.

Problems 11, 12 and 15 are based on the following price information for four bonds and assuming that all four bonds are trading to yield 5%:

Yield	Coupon Maturity	5.0% 4	5.0% 25	8.0% 4	8.0% 25
3.00%		107.4859	134.9997	118.7148	187.4992
4.00%		103.6627	115.7118	114.6510	162.8472
4.50%		101.8118	107.4586	112.6826	152.2102
4.75%		100.9011	103.6355	111.7138	147.2621
4.90%		100.3593	101.4324	111.1374	144.4042
5.00%		100.0000	100.0000	110.7552	142.5435
5.10%		99.6423	98.5959	110.3746	140.7175
5.25%		99.1085	96.5416	109.8066	138.0421
5.50%		98.2264	93.2507	108.8679	133.7465
6.00%		96.4902	87.1351	107.0197	125.7298
7.00%		93.1260	76.5444	103.4370	111.7278

Percentage price change based an initial yield of 5%:

Yield	Coupon Maturity	5.0% 4	5.0% 25	8.0% 4	8.0% 25
3.00%		7.49%	35.00%	7.19%	31.54%
4.00%		3.66%	15.71%	3.52%	14.24%
4.50%		1.81%	7.46%	1.74%	6.78%
4.75%		0.90%	3.64%	0.87%	3.31%
4.90%		0.36%	1.43%	0.35%	1.31%
5.00%		0.00%	0.00%	0.00%	0.00%
5.10%		-0.36%	-1.40%	-0.34%	-1.28%
5.25%		-0.89%	-3.46%	-0.86%	-3.16%
5.50%		-1.77%	-6.75%	-1.70%	-6.17%
6.00%		-3.51%	-12.86%	-3.37%	-11.80%
7.00%		-6.87%	-23.46%	-6.61%	-21.62%

Question 11)
Assuming all four bonds are selling to yield 5%, compute the following for each bond:
a. duration based on a 25 basis point rate shock ($\Delta y = 0.0025$)
b. duration based on a 50 basis point rate shock ($\Delta y = 0.0050$)

Question 12)
Assuming all four bonds are selling to yield 5%, compute the value for C in the convexity equation for each bond using a 25 basis point rate shock ($\Delta y = 0.0025$).

Question 15)
a. Using the value for C computed in problem 12, compute the convexity adjustment for the two 25-year bonds assuming that the yield changes by 200 basis points ($\Delta y_* = 0.02$).
b. Compute the estimated percentage price change using duration (as computed in problem 11a) and convexity adjustment if yield changes by 200 basis points.
c. How does the estimated percentage price change using duration and convexity adjustment compare to the actual percentage price change for a 200 basis point change in yield?