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Extra Swap Problems

1. Do Problem 8.14 in Chapter 8 in the text book.

2. Consider the following prices for lumber futures. Assume the annualized continuously compounded risk free rate is 2.1%. The prices are for 1000 board feet.

Delivery Date	Futures Price
Nov-01	218.5
Jan-02	232.8
Mar-02	244.7
May-02	250.1

Suppose a builder would like to lock in a purchase price for lumber in November, January, March and May. What would the swap price be? (Assume the November delivery date is 1 month from now.)

Solutions

8.14 The fixed interest rate on the swap is given by:

$$\frac{\sum_{t=1}^{n}(100 - F_{0,t,t+1})P_{0,t}}{100\sum_{t=1}^{n} P_{0,t}} = r_{FIXED}$$

Using the zero prices given in the problem we get:

EIGHT PERIOD SWAP PRICE

t	P_{0t}	r_{0t} (annualized)	$F_{0,t,t+1}$	$(100-F_{0,t,t+1})*P_{0t}$
0	1.0000			
1	0.9852	1.0615	98.5200	1.4581
2	0.9701	1.0626	98.4673	1.4869
3	0.9546	1.0639	98.4022	1.5252
4	0.9388	1.0652	98.3449	1.5538
5	0.9231	1.0661	98.3277	1.5437
6	0.9075	1.0668	98.3100	1.5336
7	0.8919	1.0676	98.2810	1.5332
8	0.8763	1.0683	98.2509	1.5327
Sum	7.4475			12.1673
r_{fixed}	0.0163			

FOUR QUARTER SWAP PRICE

t	P_{0t}	r_{0t} (annualized)	$F_{0,t,t+1}$	$(100-F_{0,t,t+1})*P_{0t}$
0	1.0000			
1	0.9852	1.0615	98.5200	1.4581
2	0.9701	1.0626	98.4673	1.4869
3	0.9546	1.0639	98.4022	1.5252
4	0.9388	1.0652	98.3449	1.5538
Sum	3.8487			6.0240
r_{fixed}	0.0157			

2. The swap payment is the payment which equates the PV of the futures to the present value of the swap payments, i.e., 3.9693*C = 938.6556 ===> C =263.48

Jan	**232.8**	**0.9949**	**231.6059**
Mar	**244.7**	**0.9915**	**242.6117**
May	**250.1**	**0.9881**	**247.1170**
	Total	**3.9727**	**939.4604**
		236.4793	