Pricing of Financial Securities and Derivatives Final Exam 15.1.2013
Time: 4 hours Examinator: Henrik Palmén
Calculator may be used
Minimum to pass:
1. Final exam only: min. 50 p
2. Midterm + Final exam: Midterm min 25p and theory section in Final Exam min 20p, altogether min 50p

PART I: Calculation (If you have passed the midterm then you can skip this. You may try to increase your points from the midterm in which case the better result of those two will be credited in the final grading.

1. Calculate both the real and nominal rates of return on the inflation protected TIPS bond (shown in table) in the second and third year. The coupon rate is 4% with yearly payments. (BKM 14.18) **15p**

Time	Inflation in Year Just Ended	Par Value	Coupon Payment	+	Principal Repayment	=	Total Payment
0		$1,000.00					
1	2%	1,020.00	$40.80		$ 0		$ 40.80
2	3	1,050.60	42.02		0		42.02
3	1	1,061.11	42.44		1,061.11		1,103.55

2. A $100 million interest rate swap has a remaining life of 10 months. Under the terms of the swap, six-month LIBOR is exchanged for 7% per annum (compounded semi-annually). The average of the bid–offer rate being exchanged for six-month LIBOR in swaps of all maturities is currently 5% per annum with continuous compounding. The six-month LIBOR rate was 4.6% per annum two months ago. What is the current value of the swap to the party paying floating? What is its value to the party paying fixed? (Hull 7.3) **20p**

3. A stock price is currently $40. Over each of the next two three-month periods it is expected to go up by 10% or down by 10%. The risk-free interest rate is 12% per annum with continuous compounding. What is the value of a six-month American put option with a strike price of $42? (Hull 12.17) **15p**

PART II: Theory

1. Briefly explain the following words and expressions
   a) Systemic risk
   b) Eurodollars
   c) Marking to market
   d) Theta
   e) Z-score **10p**

2. Briefly (no more than 10 lines / answer!) answer the following questions. Remember to explain your answers!
   a) Suppose housing pricing across the world double. *i)* Is society any richer after the change? *ii)* Are homeowners wealthier? *iii)* Is anyone worse off as result of the change? (BKM 1.6)
   b) Explain the impact of adding a call feature to a proposed bond issue on i) the offering yield and ii) the bonds expected life. iii) Describe one advantage and one disadvantage of including callable bonds in a portfolio (BKM cfa 14.5)
   c) How were the risks in ABS CDOs misjudged by the market? (Hull 8.9)
   d) How should the Black-Scholes model be modified for valuing *i)* European stock index options, and *ii)* European stock options on a stock paying a known dividend of $D before the option expires?
   e) Explain why risk neutrality can be assumed when valuing options. **20p**

When answering the following two essay-type questions, start with a table of contents!

3. Passive bond management strategies. (BKM, 16.3) **10p**

4. Arguments for and against hedging. (Hull, 3.2) **10p**

$$p = \frac{e^{r\Delta t} - d}{u - d}, \qquad \begin{aligned} c &= S \times N(d_1) - Xe^{-rT} \times N(d_2) \\ p &= Xe^{-rT} \times N(-d_2) - S \times N(-d_1) \end{aligned}, \qquad \begin{aligned} d_1 &= \frac{\ln\left(S/X\right) + \left(r + \sigma^2/2\right)T}{\sigma\sqrt{T}} \\ d_2 &= d_1 - \sigma\sqrt{T} \end{aligned}$$