Pricing of Financial Securities and Derivatives Final Exam 16.12.2011
Time: 5 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

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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. You are bearish on Deutsche Telecom Stock and you decide to sell 100 stocks short at the current market price of 50 per share.
   a) How much in cash or securities must you put into your brokerage account if the brokers initial margin requirement is 50% of the value of the short position?
   b) How high can the price of the stock go before you get a margin call if maintenance margin is 30% of the value of the short position? (BKM 3.10) **15p**

2. A 30-year maturity bond has a 7% coupon rate, paid annually. The face value is 1000. It sells today for 867.42. A bond market analyst forecasts that in 5 years, 25-year maturity bonds will sell at yields to maturity of 8%. Because the yield curve is upward sloping the analyst believes that the coupons will be invested in short-term securities at a rate of 6%. What is the annual expected rate of return over the 5-year period? (BKM 16.19 modified) **15p**

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? (If you do not remember how to calculate it then assume that the probability $p = 0.7$) (Hull 12.17) **20p**

PART II: Theory

1. Briefly explain the following words and expressions
   a) Maintenance margin
   b) Indexed bond
   c) Hazard rate
   d) Basis risk
   e) Gamma **10p**

2. Briefly (no more than 10 lines / answer!) answer the following questions. Remember to explain your answers!
   a) Give an example of three financial intermediaries and explain how they act as a bridge between small investors and large capital markets or corporations. (BKM 1.13)
   b) Describe one advantage and one disadvantage for the investor to invest in a callable bond. (BKM 14, CFA 5)
   c) "When the zero curve is upward sloping, the zero rate for a particular maturity is greater than the par yield for that maturity. When the zero curve is downward sloping, the reverse is true." Explain why this is so. (Hull 4.18)
   d) Explain the difference between the credit risk and the market risk in a financial contract. (Hull 7.6)
   e) Is it correct to use the Balck-Scholes model to price an American *i)* call option and *ii)* put option on a non-dividend paying stock? **20p**

When answering the following questions start with a table of contents!

3. Which are the three main methods for estimating the default probability for publicly traded debt (bonds), and why do the different methods produce different estimates on default probability? (Hull ch. 14) **10p**

4. Theories of the term structure of interest rates and the shape of yield curves. (BKM ch. 15, Hull ch 4) **10p**