EXERCISES: DERIVATIVES

The following self-assessment exercises on derivatives are taken from your book and may be subject to changes depending on the edition that you have (Mishkin/Eakins – Financial markets and institutions, Pearson). Solutions will be provided in a following video.

1. Suppose that the pension you are managing is expecting an inflow of funds of $100 million next year and you want to make sure that you will earn the current interest rate of 8% when you invest the incoming funds in long-term bonds.
   How would you use the futures market to do this?
   How would you use the options market to accomplish the same thing?
   What are the advantages and disadvantages of each alternative?

2. Suppose you buy a call option on a $100,000 Treasury bond futures contract with an exercise price of 105. If the price of the Treasury bond is 115 at expiration, is the option at the money, in the money or out of the money? Determine the premium if the profit equals $8,000.

3. Jason bought a put option on a $100,000 Treasury bond futures contract with an exercise price of 105 for a premium of $2,000. If on expiration the futures contract sells for 110, determine Jason´s profits and explain if he will exercise the right to sell the futures contract. How would your answer change if the futures contract sells for 95 on expiration?
   Determine Jason´s profits (for both prices on expiration date) if instead of buying a put option on a futures contract he sold a $100,000 Treasury bonds futures contract at par.

4. If your company has to make a 10 million euros payment to a German company in June, three months from now, how would you hedge the foreign exchange risk in this payment with a 125,000 euros futures contract?

5. Suppose that your company will be receiving 30 million euros six months from now and the euro is currently selling for 1 euro per dollar. If you want to hedge the foreign exchange risk in this payment, what kind of forward contract would you want to enter into?

6. A bank issues a $100,000 variable-rate, 30-year mortgage with a nominal annual rate of 4.5%. If the required rate drops to 4.0% after the first six months, what is the impact on the interest income for the first 12 months? Assume the bank hedged this risk with a short position in a 181-day T-bill future. The original price was 97,81 and the final price was 98,03 on a $100,000 face value contract. Did this work?

7. A trust manger for a $100,000,000 stock portfolio wants to minimize short-term downside risk using Dow put options. The options expire in 60 days, have a strike price of 9,700, and a premium of $50. The Dow is currently at 10,100. How many options should she use? Long or short? How much will this cost? If the portfolio is perfectly correlated with the Dow, what is the portfolio value when the option expires, including the premium paid?