Question: Derivatives in Portfolio Management (33 points)

You are portfolio manager at B&V Investment Management. Tomorrow morning you have an important meeting with the legal officer appointed by your best customer, a big European company, for analyzing their stock portfolio. Positive performance over the last semester aside, you expect that your customer will be particularly worried about, first, the effect of the global financial crisis in progress and, secondly, the high volatility in the EUR/USD exchange rate. Therefore, you are discussing with your staff the optimal financial strategies to suggest to your customer for the next year.

a) During the technical meeting with your staff, you suggest hedging the stock portfolio against a potential negative trend in the financial markets due to the unresolved effect of the global financial crisis with stock index futures. Although 20% of stocks in portfolio are not listed in European markets, you propose the EURO STOXX 50 as benchmark.

   Given that the stock portfolio market value is EUR 80 million and its beta with the EURO STOXX 50 index is equal to 1.10, calculate how many futures contracts are needed to fully hedge your managed position. The last quotation of the EURO STOXX 50 is 3,015, while the current value of the EURO STOXX 50 Futures with 1 year maturity is 2,960 and its contract size is EUR 10 per index point. (5 points)

b) Now, you concentrate on the opportunity of hedging the 20% of the managed portfolio quoted in USD currency by trading at the CME Globex Electronic Market in EUR/USD futures contracts (for 1 EUR, x USD is received; the contract size of each EUR/USD futures contract is EUR 125,000).

   b1) In order to protect the managed portfolio from a drop of the USD currency, do you need to buy or sell futures? Explain your answer. (3 points)

   b2) After discussing with your staff, you decide to totally hedge the USD portfolio component for the next semester and then you decide to verify and update your strategy. By assuming that in the next semester the market performance of the 20% of the managed portfolio invested in US Companies is zero, while the euro exchange rate appreciates against the dollar from USD 1.1050 / EUR to USD 1.1505 / EUR, describe the profit/loss of the managed portfolio at the end of the semester with and without the hedging strategy (Assume that the futures contract entered into has a delivery price equal to the current spot price i.e. 1.1050). (12 points)

c) As an alternative to hedging strategies, you evaluate a protective strategy using index put options. The target is to constitute a floor to protect the managed portfolio against a decline in capital value of more than 8% over the next year. The stock portfolio is effectively well-diversified and its dividend yield is 2% p.a. (continuously compounded), the same value of the dividend yield on the EURO STOXX 50 index. The risk-free interest rate is 1.0%.

   c1) Calculate the decline in the market index (EURO STOXX 50) that corresponds to the 8% decline in the capital value of the portfolio (6 points)

   c2) Assuming that the insurance cost is to be borne externally from the managed funds, define which options with maturity exactly one year from now should have been considered and how many option contracts should have been purchased or sold. (7 points)