FINM3033 Risk Management in Finance

Assignment 3

Problem 1.

Values for the NASDAQ Composite index during the 1,500 days proceeding March 10, 2006 are attached. Calculate the one-day 99% VaR and one-day 99% ES on March 10, 2006, for a $10 million portfolio invested in the index using:

a) The basic historical simulation approach

b) The exponential weighting scheme with $\lambda = 0.995$

c) The volatility-updating procedures with $\lambda = 0.94$ (Assume that the initial variance when EWMA is applied is the sample variance.)

d) A model where daily returns are assumed to be normally distributed with mean zero (Use the equally weighted approach to estimate the standard deviation of daily returns.)

Discuss the reasons for the differences between the results you get.

Problem 2.

A portfolio consists of two assets. $1 million is invested in Asset 1 and $2 million is invested in Asset 2. The estimated daily variance for the return of Asset 1 is 0.01, for the return of Asset 2 the daily variance is 0.005. The estimated covariance for daily returns of two assets is 0.002. What is the 10-day VaR at the 95% confidence level?