**Advanced Risk Management (FIN 30270)**

**Tutorial 3: Volatility Weighted and Parametric VaR in Matlab**

**Required Preparation**

* Revise over the Non-Parametric notes covered in Lecture 2 and the Excel example provided
* Work through the Excel example provided for the Parametric approaches in Lecture 3
* **In advance of Tutorial 3 all students must take the Matlab file from last week’s Tutorial which is used to estimate the Historical Simulation VaR and build on this code in order to arrive at an estimate for the Expected Shortfall from the data set provided in Tutorial 2**
* Students will be required to show their tutor the workings they completed and the answers obtained

**Material**

* Matlab script – “*Tutorial\_2\_HistoricalSimulation\_VaR*”
* Matlab function – “*historicalVaR*”
* Excel file with sample data – “*VaR\_Data*”
* Excel file with sample data – “*VaR\_Data\_Tutorial\_3*”
* Matlab script – “*Tutorial\_3\_Volatility\_Weighted*”
* Matlab script – “*Tutorial\_3\_Parametric\_VaR*”

**Objectives**

* Students should demonstrate an ability to estimate Historical Simulation Expected Shortfall in Matlab given the approach demonstrated for the estimation of Historical Simulation VaR
* This tutorial will walk present the code required to estimate volatility using an Exponentially Weighted Moving Average (EWMA) Model and thus the code required to estimate a volatility weighted VaR
* The approach to be used for Parametric approaches to the estimation of VaR including the normal distribution and Monte Carlo Simulation will also be covered

**Tutorial Outline**

* The tutorial will begin by walking through the solutions students have arrived at for their estimated Historical Simulation Expected Shortfall values
* The tutor will discuss any coding issues encountered by students
* The approach to be used for estimating an EWMA Model and thus a volatility weighted non-parametric VaR with two loops will then be covered
* The use of a normal distribution for the estimation of a Parametric VaR will be outlined
* The tutorial will conclude by specifying the code required in order to estimate a Monte Carlo Simulation based VaR