**FIN4150: Financial Data Analysis**

**Individual Coursework Assignment 1 and Solution**

(Total Marks 100; No Word Limit)

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# Preparation and Submission Guidelines

This assignment should be completed by using Microsoft Word. There are 4 parts in this assignment. Part 1 requires you to write the syntax of command that you would need to write in a STATA do **file** for the data used in this assignment in an accurate order. Part 2 requires Exploratory Data analysis, Part 3 requires Descriptive Measures analysis, and Part 4 requires Inferential Statistics analysis using the outputs from the STATA. The answers for Parts 2, 3 and 4 should be presented in the **WORD Document** format.

The **Word document file** containing answers for Parts 1, 2, 3, and 4 should be submitted follow the link provided on the FIN4150 module page on My Learning.

**The deadline: 23:55 5th April 2020**

**Part 1: Create STATA Data file (10 marks in total)**

* 1. This coursework uses the MS Excel data file ('coursework 1 data.xls' File) from ‘My Learning – FIN4150 Module Page in Individual Coursework Assessment 1 folder’. A STATA files is created using the data imported from the MS Excel file.

You would like to determine whether the monthly returns on Microsoft stock can be explained by reference to unexpected changes in a set of macroeconomic and financial variables. There are 250 monthly observations in the excel file, starting in March 1986 and ending in December 2006. Also, there are six series, i.e. the Microsoft stock price (MICRO), the S&P500 index value (SANDP), the consumer price index (CPI), an industrial production index (INDUST), a consumer credit series (CONS), and a credit spread series (SPREAD).

**For all six series, the monthly changes of the data in logarithms were created. The names of the new variables are as follows:**

microreturn (created from MICRO)

marketreturn (created from SANDP)

cpilogchange (created from CPI)

industlogchange (created from INDUST)

conslogchange (created from CONS)

spreadlogchange (created from SPREAD)

**Required:**

**Write the syntax of commands that you are supposed to write in the STATA do file in an accurate order.**

**You do not need to use STATA to do this, simply types them in your answer.**

**Part 2: Exploratory Data Analysis (10 marks each/ 20 marks in total)**

2.1 Below is the **time series plot** of **the monthly returns of Microsoft stock (variable named** microreturn)**, created** using the STATA data file created under Part 1 of the assignment.

You are required to **discuss/analyze** what you observe in the chart/graph.

(Your answer should focus on the trend, centre tendency, and variation of the data)

**Microsoft Stock Return 3/1986-12/2006**



2.2. This is the **frequency distribution graph** for the **Microsoft returns** variable. You are required to **discuss/analyze** what you observe in the graph.

Your comments should focus on shapes (skewness, mode), centre, range, outliers of the distribution.

**Histogram of the Microsoft returns**

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**Part 3: Descriptive Measures** **(10 marks each/ 20 marks in total)**

3.1 The mean, standard deviation, skewness and kurtosis of **Microsoft returns** (variable named microreturn) **and S&P500 returns** (variable named marketreturn**) are reported as below**.

What do you conclude about the **skewness and kurtosis of the two variables**?

**(10 marks/ 5 marks each )**

**Microsoft returns**

Mean = \_\_\_ .0003307 \_\_\_\_\_\_\_\_

Standard Deviation = \_\_\_ .1552541 \_\_\_\_\_\_\_\_

Skewness = \_\_\_ -1.739003 \_\_\_\_\_\_\_\_

Kurtosis = \_\_\_ 8.785954 \_\_\_\_\_\_\_\_

**S&P500 returns**

Mean = \_\_\_ .0071533 \_\_\_\_\_\_\_\_

Standard Deviation = \_\_\_ .0438032 \_\_\_\_\_\_\_\_

Skewness = \_\_\_\_ -1.15334 \_\_\_\_\_\_\_

Kurtosis = \_\_\_\_ 7.498729 \_\_\_\_\_\_\_

3.2 STATA provides the following output for the test for **normality** of **Microsoft returns**.

**Explain the results of this test.** **(10 marks)**

Jarque-Bera normality test results: Chi(2) = 472.8 p=2.e-103

**Part 4: Inferential statistics** **(50 marks in total)**

4.1 This STATA output reports the **correlation matrix** between the **Microsoft returns and the S&P500 returns**. Interpret your results in terms of significance and strength of correlation.

**(10 marks)**



4.2 The STATA output below reports the coefficients of linear equation involving Microsoft returns as dependent variable, and all other variables as independent variables.

**The model has the form:**

,

You are required to interpret the findings (i.e. **report the significance of the parameters, the R-squared, and F-test**).

**(20 marks)**



4.3 The equation in 4.2 is estimated again excluding the independent variables which are not significant. Also, a **dummy variable**, which takes the value one after January 2000 (covering the period after the dot-com bubble), is added to the model. STATA results is reported as below.

You are required to interpret the results (i.e. **report the significance of the parameters, the R-squared, and F-test**).

**(20 marks)**

