For this assignment you will first download the master dataset. This file gives quarterly earnings, total assets, total liabilities and research & development expense for 20 random companies over the time period 2000-2015. The goal of this project is to demonstrate your knowledge of the method of ordinary least squares regression along with how to calculate the desired outputs using Microsoft Excel. To this end you will perform a series of regressions using the instructions below and answer the questions that follow. This project is to be completed with 3 to 4 other students that I will assign to groups and is due via email, by **May 1** at 11:59PM..

Another goal of the project is to allow you an opportunity to practice your oral presentation skills. To this end each group will present (via Power Point) information about their company for at most 5 minutes on **May 1** in class.

There are three things I want from each group by May 1. First, email me a Word document with the answers to the questions asked below. Second, e–mail me an Excel file with the regression output for each of the regressions you run. The output for each regression should be on a separate Excel worksheet (but all in the same Excel file). Third, you should also email me the PPT slideshow you will use for your group oral presentation.

Instructions

First, let TA, TL, E and RD represent total assets, total liabilities, earnings and research & development expense respectively. Next, I want you to use the method of least squares to estimate several different models (i.e. I want you to run several different regressions). The purpose of this exercise is to try and find the model that best explains variation in the dependent variable (E). The models I want you to examine are listed below where i represents the i'th observation (i'th row of the data matrix).

$$E_i = \beta_0 + \beta_1 TA_i \tag{1}$$

$$E_i = \beta_0 + \beta_1 TL_i \tag{2}$$

$$E_i = \beta_0 + \beta_1 RD_i \tag{3}$$

$$E_i = \beta_0 + \beta_1 TA_i + \beta_2 TL_i \tag{4}$$

$$E_i = \beta_0 + \beta_1 TA_i + \beta_2 RD_i \tag{5}$$

$$E_i = \beta_0 + \beta_1 TL_i + \beta_2 RD_i \tag{6}$$

$$E_i = \beta_0 + \beta_1 TA_i + \beta_2 TL_i + \beta_3 RD_i \tag{7}$$

You should run these regressions in Excel and make a worksheet tab for each regression that displays the regression output. You should also calculate the correlation matrix for the variables. The Excel file you turn into me (by e–mail) should thus have 8 tabs; one for each of the seven regressions you run and one for the correlation matrix. You can label the tabs "Reg. 1 Output", "Reg. 2 Output"... "Correlation Matrix". Finally, you should type the answer to the following questions in a Word document and submit to me as well (by e–mail).

Questions (round any numerical answer to 4 decimal places)

(1) What is the sample size?

(2) What is the estimated fitted line for each of the seven regressions?

(3) Are the coefficients on the independent variables in model (7) statistically significantly different from zero? Explain.

(4) What are the adjusted R^2's for each of the seven regressions?

(5) Which model is best able to explain variation in the dependent variable? What indicates this?

(6) Explain, in words, the adjusted R^2 for model (7).

(7) Why is the adjusted R^2 a better estimate of the model fit than the R^2?

(8) Compute the Correlation Matrix for the variables. What is the correlation between each pair of independent variables?

(9) Using your answer to Question (8) why is the coefficient on total liabilities in models (2) and (6) statistically significantly positive but in models (4) and (7) it is statistically significantly negative?

(10) Using the coefficients from model (7) what is the error in estimation for the 13'th observation?

Oral Presentation

Each group will be required to present for at most 5 minutes on one company that I will choose for you. The presentation must be delivered via Power Point. The following things should be covered at minimum in the presentation for the company you were assigned. Groups will be graded based solely on their presentation skills (eye contact, voice inflection, etc.) including the professional look of their Power Point presentation. I will provide constructive feedback to each group member regarding their presentation skills therefore each student should have a part in the presentation. I have also listed a rubric below that I will use to grade the oral presentation. The items in the rubric will all be graded on a 1 to 10 scale (basically a first impression judgement call on my part). I will be pretty lenient on the grading but will take notes for each person and give them constructive feedback afterwards.

Things at Minimum that Need be Covered in the Presentation

(1) A description of the company you analyzed, including what industry it is in, its main line of business and its major competitors.

(2) A plot and discussion of corporate earnings over the past 5 years.

(3) A plot and discussion of corporate stock price performance over the past 5 years.

(4) An interesting fact about the company in recent media coverage.

Presentation Rubric

(1) Voice inflection (i.e. too high, too low)

(2) Nervous ticks (e.g. fumbling of hands, saying "like" or "uh" repeatedly etc.)

(3) Eye contact (i.e. looking around the room instead of at only one part of the room...I am not the best at this by the way either)

(4) Body Language (e.g. illustrating points with hand gestures but not too much is a good thing whereas slumped shoulders and overall lack of enthusiasm is not so good)

(5) PPT presentation professional look