

Final Workshop

EC2003 - Financial Econometrics I

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Learning Objectives

1. Learn about basics of fundamental analysis and its relation to market returns
2. Reinforce your knowledge about linear regression models and how they apply to Finance
3. Learn about Logistic regression models
4. Learn about the US market
5. Reinforce your financial data management skills using R/Rstudio

Description of the project

Students must work in teams of 2, maximum 3.

In this project you will do a fundamental analysis of the US market using econometric models.

You have to use R/RStudio. You must deliver a R markdown document (.Rmd and html) with your explanations, model outputs, interpretations, and conclusion.

Specific directions

1 Descriptive statistics of the US market

(10 pts) You will have to do the following:

1. Download the dataset <http://www.apradie.com/datos/us2020a.xlsx> into your RStudio. Using Economatica, I already constructed this dataset with annual financial and market data for ALL US firms from 2010 to the most recent fiscal year available (2020). This dataset has a panel-data structure and it has annual data about all active and not active firms. For each stock you can find several financial statement variables over many years. Those firms that did not exist in any of these years have missing values for all variables. All variables are in 1000's USD .
2. Create a table with the Descriptive Statistics for the main financial statement variables of ONLY the ACTIVE firms using ONLY the year 2020. For the descriptive statistics select the financial statement variables: Total Assets, Total Liabilities, Stock-holder Equity, Revenue, EBIT and Market Value. Here you have to show mean, median, minimum, maximum and standard deviation. You have to provide an explanation with your interpretation of these descriptive statistics.

3. Selecting year 2020, show a table by Industry with number of firms, median of total assets, median of Market Value. Interpret this table to illustrate the most important features of the US market (in terms of median size and market value of the firms by industry and overall).
4. Generate variables for annual continuously compounded (r_a) and annual simple market returns (R_a) for each firm-year.

2 Fundamental analysis

(60 pts) Download the same dataset we used in the previous part.

1. Learn about Accounting Fundamental Analysis. You have to:
 - (a) Read and summarize the paper “The Relevance of Using Accounting Fundamentals in the Mexican Stock Market”. Download the paper from [HERE](#). Your summary has to have:
 - i. A brief description of the study, the methodology used (half of a page).
 - ii. Detailed explanation about the way of computing the FScore proposed in the paper, and how this FScore is used in the paper. (No more than 2 pages)
 - iii. Explain with your own words the interpretation of the regressions reported in the paper (No more than 2 pages)
2. In the paper, two scores are calculated: FScore and LScore. Each score has several accounting signals related to profitability, operational efficiency and financial leverage. You have to calculate only the FScore for all firms-years.
3. You have to replicate the econometric models of the paper (except for the LScore models), but for US firms. You have to consider only non-financial firms. Run the corresponding models and show the results. Here you have to winsorize ratios such as BMR and EPSP, and use natural log of total assets for firm size.
4. Provide a detailed interpretation of the models, and also explain how these results compare to the results of the Mexican market (those of the paper).
5. Construct a portfolio with 10 firms with the best value for FScore in 2019. Assign equal weights for each stock. Calculate the Holding-period return of this portfolio for 2020. Compare the holding return of this portfolio with the annual return of the S&P500. You can download the S&P500 data for 2020 from Yahoo Finance Report your results.

3 Examining the probability of bankruptcy/surviving

(30 pts) You have to read the Chapter 16 - “Regression on Dummy Dependent Variable: The LPM, Logit, Probit and Tobit models”, book: Basic Econometrics by Gujarati (any edition). There is a new Spanish version by Gujarati called “Econometría”. Be sure you understand the logit and probit models. You have to do the following:

1. With your own words explain what is a logit model, what is the application of this model, and the mathematical equation used to represent the probability of success (or failure). You can search for youtube tutorials to learn how to run a logit model in R, and/or a tutorial to learn how to interpret the output of a logit model.
 - (a) Run a logit regression model to examine whether financial leverage and cash-flow ratio are related to the probability of surviving. Use status as the dependent variable. Status=1 if the firm is active, and 0 if the firm is not active. A firm that is not active it might be possible that the firm went bankrupt or was acquired by another firm. Make sure you provide a clear interpretation of results (coefficients, odd-ratios, p-values).
Hint: Click [HERE](#) to check how to run a logit model in R
 - (b) Provide a clear interpretation of this logit model

You have to submit your R Markdown file (.rmd) along with its corresponding pdf or html version. This document must have the following sections:

- Introduction - Here you have to briefly explain what you did in this workshop (which analysis you did) and which dataset you used. The rest of the sections of your document are the sections of this workshop, and at the end you have to write your team conclusions.
- Descriptive statistics of the US Market
- Fundamental analysis
- Examining the probability of surviving
- Conclusion