

## Research Lab: Business Economics

### Assignment 3

#### Question 1 – CAPM and FF models (20 points)

The datafile mstocks.dta contains monthly (holding period) returns, from Jan 2001 to Dec 2019, of three stocks:

- Krispy Kreme Doughnuts (KKD)
- Amazon Com Inc (AMZN)
- Northrop Grumman Corp (NOC)

It also contains Fama-French factors and the one-month Treasury Bill rate.

- Estimate the CAPM for each stock above. Is any stock paying abnormal returns? What's their expected abnormal return in a year (12 months)? What is the riskiest stock? What is the safest stock? (5 points)
- Test the joint hypothesis for market efficiency. (5 points)
- Add SMB and HML to the model. Should you add these factors to the model? What does it happen to  $\alpha$  and  $\beta$  after you add these factors? (5 points)
- How do the stocks respond to SMB and HML? What's your interpretation? (5 points)

#### Question 2 – Event Study – Dodd-Frank Act (40 points)

From Wikipedia:

“The Dodd-Frank Wall Street Reform and Consumer Protection Act (commonly referred to as Dodd-Frank) is a United States federal law that was enacted on July 21, 2010. The law overhauled financial regulation in the aftermath of the financial crisis of 2007-2008, and it made changes affecting all federal financial regulatory agencies and almost every part of the nation's financial services industry.”

“On **June 25, 2010**, conferees finished reconciling the House and Senate versions of the bills and four days later filed a conference report. The conference committee changed the name of the Act from the “Restoring American Financial Stability Act of 2010”. The House passed the conference report, 237–192 on **June 30, 2010**. On **July 15**, the Senate passed the Act, 60–39. President Obama signed the bill into law on **July 21, 2010**.”

In this question, we study the effect of the Dodd-Frank Act on the value of financial institutions. We start the event on June 25, 2010.

The datafile dstocks.dta contains daily prices, from May 1, 2009 and Dec 31, 2010, and the following variables: SIC code, Share Volume, and Number of Shares Outstanding.

#### Steps:

- Define the estimation window from May 4, 2009 to April 29, 2010 (40 days before the event)
- Construct the following dummies for the following groups: (3 points)

- Financial institutions (*fininst*): SIC between 6000 and 6500 (excludes real estate and holdings)
  - Depository institutions (*bank*): SIC between 6000 and 6100
  - Credit institutions (*credit*): SIC between 6100 and 6200
- c. Calculate daily returns (*lret*) as the difference in log prices. **(2 point)**
- d. Calculate *alpha* and *beta* from stock-specific CAPM models. You don't have to report the regression. Just show the mean and standard deviation of alphas and betas in the sample. **(5 points)**
- e. Calculate the abnormal returns (*AR*) and the cumulative abnormal returns (*CAR*) starting 20 days before the event (May 27, 2010) **(5 points)**
- f. Estimate the average CAR on the day Obama signed the bill, July 21 2010 (17 trading days after the event). Also estimate the market portfolio CAR on that day. Please interpret your results. **(10 points)**
- g. For the same day, estimate weighted-value portfolio CAR as a function of the dummies constructed in b. Who wins and who loses with the Dodd-Frank Act? Is there any difference between banks and other credit institutions? **(10 points)**
- h. For the day before the event (June 24, 2010), estimate weighted-value portfolio CAR as a function of the dummies constructed in b. Was the market already pricing the Dodd-Frank Act? **(5 points)**

Question 3 – Difference-in-Difference (DiD) **(10 points)**

The datafile compustat.dta contains annual financial variables from nonfinancial firms listed in the US, from 2004 to 2017. The following variables are not original from their financial statements, but constructed:

- Asset growth:  $(at - l.at) / l.at$
- Sales growth:  $(sale - l.sale) / l.sale$
- Investment:  $capx / l.ppent$
- Leverage:  $(dlc + dltd) / at$
- CFTA:  $(ib + dp) / l.at$
- Market cap:  $csho * prcc\_f$
- Size:  $\ln(at)$

You will estimate the effect of **information disclosure on investment**, using the **SEC discontinuation of 10KSB in 2008** (more details on Cabazon (2018)). To do so, construct a treated group and a control group:

- Treated: companies with market cap lower than 25 million USD in 2007 (at the end of fiscal year).
- Untreated: companies with market cap greater than 25 million USD, but lower than 100 million in 2007.

- You may exclude the other companies
- Note that numbers in COMPUSTAT are in millions.

The post-treatment period is after 2008 and the pre-treatment period is before 2008 (including this year).

- a. For the years 2006-2009, estimate the following difference-in-difference model:

$$investment_{i,t} = \beta_0 + \beta_1 post + \beta_2 treat + \beta_3(post \times treat) + \varepsilon_{i,t}$$

where *post* is 1 if post-treatment period and 0 otherwise, and *treat* is 1 if treated group and 0 otherwise. **(5 points)**

- Don't forget to cluster the standard errors
- b. Please provide a short interpretation for  $\beta_0$ ,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$ . **(5 points)**

Question 4 – More Difference-in-Difference (DiD). Put parts a, b, c, and d in one table. **(20 points)**

- a. Estimate the same model as in Question 3, but expanding to the sample to years 2005-2017. Any change? **(5 points)**
- b. Estimate the same model as in Q4a., but including year dummies and industry (4-digit sic) fixed effects. Any change? **(5 points)**
- c. Estimate the same model as in Q4b., but including year dummies and firm fixed effects. Any change? **(5 points)**
- d. Estimate the same model as in Q4c., but controlling for lagged leverage and lagged CFTA. Any change? **(5 points)**

Question 5 – Even more Difference-in-Difference (DiD) **(10 points)**

- a. Perform a test for parallel trends. Be creative! **(5 points)**
- b. Is the DiD in Question 3 valid? Why or why not? **(5 points)**