RULES

NEOMA
BUSINESS SCHOOL
REIMS · ROUEN · PARIS

1. 2 students minimum by group

2. 3 students maximum by group

3. Deadline: January 7, 11.59 pm

4. -2 points by day beyond the deadline

5. Your documents (word file + python file + excel file) must be uploaded under Courses in a single zipped file.

INSTRUCTIONS FOR STUDENTS (1)

1. Choose a U.S. corporate event that you are interested in (i.e. firm + event date). Some examples are provided in the last slide.

2. In an word file, explain what has happened on the event date.
   - ✓ *Why is it relevant for the firm value?*
   - ✓ *What do you expect to be the impact of the event on the stock price? Positive, negative, ambiguous? Please explain.*

3. Download the stock price data for the firm from 120 trading days before the event date to 5 trading days after the event date. And, download S&P 500 data for the same period.

4. Save the data in an excel file

5. Open Python and create a .py file

6. import the excel file to Python

7.   Instead of 4-5-6, you can directly extract the data from Yahoo Finance (hint: Panda package)

8.   Show graphically the evolution of the stock price over time. Show the volume on the same graph using the secondary axis.

9.   Calculate the stock returns from t-120 to t+5.

10. Let's define the control window as [t-120, t-6] where "t" is the event date. Compute the average returns and the volatility over the control window.

11. Let's define the event window as [t, t+5] where "t" is the event date. Compute the average returns and the volatility over the event window

12. For control window, obtain the stock's alpha $\hat{\alpha}$ and beta $\hat{\beta}$ by estimating the following regression (market model):

$$R_{t,cw} = \alpha + \beta \times R_{mt,cw} + \epsilon_t$$

Where $R_{t,cw}$ is the return of the stock on day t (control window) and $R_{mt,cw}$ is the return of the S&P 500 on day t (control window).

13. Compute the abnormal returns of the event window by subtracting the expected returns using market model from realized returns of the event window.

$$AR_{t,ew} = R_{t,ew} - \left(\hat{\alpha} + \hat{\beta} \times R_{mt,ew}\right)$$

Where $R_{t,ew}$ is the return of the stock on day t (event window) and $R_{mt,ew}$ is the return of the S&P 500 on day t (event window).

14. Compute the cumulative abnormal returns

$$CAR_{ew} = \sum_{t=event}^{5} AR_{ew}$$

15. Compute the following test statistics

$$Stat = \frac{CAR_{ew}}{\sqrt{6} * \sigma_{AR}}$$

Where σ_{AR} is the standard deviation of the abnormal returns over the **control window (not event window!)**.

16. Compared it to the critical value (use the normal distribution, confidence level = 95%). Is the CAR of the event window significantly different from 0?

INSTRUCTIONS FOR STUDENTS (5)

✓ Use the print instructions to display in the IPython console the results of steps 7 to 16.

✓ For clarity, please use sentences (eg. "Average stock return over the control window: xxx % ")

Corporation: XXX
        Ticker: XXX

Event nature: ...
    Event date: ...
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Summary
========

Control window

Average returns: ...
Volatility: ...

Event window

Average returns: ...
Cumulative returns: ...
.....
.....

INSTRUCTIONS FOR STUDENTS (6)

✓ The professor should be able to generate all your results by just clicking the <<Run>> buttton.

✓ Coding clarity is strongly recommended.

✓ You **MUST** use comments to describe your steps.

SAMPLE EVENTS

No.	Corporation	Event date	Event Nature
1	General Electric	2021 Nov 9	Spin-off
2	Paypal	2021 Nov 17	Key Analyst Downgrade
3	Pfizer	2021 Dec 10	Dividend Increase