

FIN 3080 Investment Analysis and Portfolio Management

Spring 2024 | CUHK (SZ)

Assignment III

Due: 23:59, April 19, 2024

Disciplines

- A delayed or incomplete submission before the suggested solution is released will result in a deduction of few points. No submission or submission after the suggested solution is released will result in a deduction of all points.
- A complete submission must include two files: (i) a typed PDF file (1.5-spaced, 11pt, no longer than 5 pages) including your arguments, tables and figures in English (excluding your codes), and (ii) a compressed package named “YourID_YourName” containing one or multiple code files that generate the empirical results in your PDF file.
- You may discuss with your peers but plagiarism and fabrication are strictly prohibited and will be directly reported to the Registry Office.
- You may choose any programming languages to finish the assignment. Excel is not considered as a programming language.

Problems

1. Please download daily *Closing Index* for the *CSI 300* index from *China Stock Market Series/Stock Trading/Market Index* table over 2004/1/1 to 2023/12/31, and finish the following tasks.
 - (a) Manually derive monthly *CSI 300* index returns and provide summary statistics on *mean*, *standard deviation*, *skewness* and *kurtosis* for monthly *CSI 300* index returns.
 - (b) Plot a histogram for *CSI 300* monthly returns.
 - (c) Discuss whether returns of the *CSI 300* index follow a normal distribution.
2. Since Jensen, Black, and Scholes (1972, hereafter BJS), there have been many attempts to empirically test the relation between asset risks and expected returns. Chen et al. (2019) conduct a simplified version of BJS’s test on the Chinese market. Please carefully read through Chen et al. (2019) and finish the following tasks.
 - (a) Download weekly *Returns Without Cash Dividend Reinvested* for all A-share mainboard stocks from *China Stock Market Series/Stock Trading/Individual Stock Trading* table from the first week of 2017 to the last week of 2022.

- (b) Calculate weekly market returns as the mean value of weekly returns of all mainboard stocks .
- (c) Load weekly risk-free return data from “*weekly_risk_free_rate.xlsx*” or “*weekly_risk_free_rate.dta*”.
- (d) Follow section 4 in Chen et al. (2019) to replicate Table 2 and 3 with data obtained from (a) - (c).
In other words, you reproduce two tables with the original methodology yet with different data.

Hints

1. When the number of observations of requested data is very large, CSMAR may split your data into multiple files. Do remember to concatenate all raw data files.
2. Denoted by $R_{k,t}$ the returns for index k at time t . You may calculate $R_{k,t}$ as follows:

$$R_{k,t} = \frac{I_{k,t}}{I_{k,t-1}} - 1,$$

where $I_{k,t}$ is the closing index for k at t . In other words, you do not have to worry about issues like *dividends* or *changes in tradable shares* when calculating index returns.

3. The file “*weekly_risk_free_rate*” contains weeklized returns of 1-year government bonds sourced from CBIRC. You can directly use “*risk_free_return*” therein as weekly risk-free returns.
4. You may find the combination of `bysort` and `asreg` in Stata helpful to run regressions by group and store coefficients as new columns correspondingly.
5. In an empirical replication, you do not necessarily have to generate exactly the same coefficients or t -statistics (nor is it possible) but you should follow the original design and find comparable results or slightly different results with solid justifications.

References

- Chen, Yifan et al. (2019). “Empirical test of CAPM in Shanghai securities market”. In: *Finance* 9, pp. 28–33.
- Jensen, Michael C, Fischer Black, and Myron S Scholes (1972). “The capital asset pricing model: Some empirical tests”. In: *Studies in the Theory of Capital Markets*.