EMPIRICAL ANALYSIS OF FACTOR PRICING MODEL WITH UK DATASET

This coursework examines your understanding of factor pricing model and evaluate how you can empirically access it using real data.

To this end, you first read a paper by GTC (2013):
Gregory, A., R. Tharyan and A. Christidis, 2013. Constructing and Testing Alternative Versions of the Fama-French and Carhart Models in the UK. *Journal of Business & Accounting*, 40(1) & (2), 172-214.

Next, you download **RELEVANT DATASET FOR YOUR TASK** from http://business-school.exeter.ac.uk/research/centres/xfi/famafrench/ where they provide the UK **Fama-French and Momentum Factors, Portfolios and other Benchmark Portfolio Data**:For more details on the construction of the factors and portfolios below and asset pricing tests on these, please see GTC (2013).

Factor Data

Datasets containing the Daily, Monthly and Annual SMB, HML and momentum factors for the UK market 1980OCT-2015JUN (daily from 1988OCT to 2015JUN). The zip folders contains the relevant data files in excel (.xls), ascii (.txt) and STATA (.dta) formats.

Dataset Name	Description	Data File
Daily Factors	Daily smb, hml, umd factors, risk free rate and market returns, based on the largest 350 firms.	dailyfactors.zip
Monthly Factors	Monthly smb, hml, umd factors, risk free rate and market returns.	monthlyfactors.zip
Annual Factors	Annual smb, hml, umd factors, risk free rate and market returns.	annualfactors.zip

Portfolio Data

Datasets containing the Fama-french and momentum portfolios used to create the SMB, HML and UMD factors and other benchmark portfolios. The zip folders contains equally and value weighted returns data files in excel (.xls), ascii (.txt) and STATA (.dta) formats and a file containing information on the number of portfolios per year and the cutoffs points used to create the portfolios.

Dataset Name	Description	Data File
6 Size/BM Portfolios	6 Size/BM portfolios used to form the smb and hml factors.	6ports_size_bm.zip

6 Size/Mom Portfolios	6 Size/Mom portfolios used to form the umd factor.	6ports_size_mom.zip
25 Size/BM Portfolios	5 size portfolios – 4 portfolios formed from the largest 350 firms + 1 portfolio formed from the rest intersected with 5 B/M portfolios – based on the largest 350 firms.	25ports_size_bm.zip
25 Size/Mom Portfolios	5 size portfolios – 4 portfolios from the largest 350 + 1 portfolio from the rest Intersected with 5 Momentum portfolios – based on the largest 350 firms.	25ports_size_mom.zip
27 Size/BM/Mom Portfolios	3 Size portfolios – 2 portfolios formed from the largest 250 firms + 1 group from the rest, then within each size group we create 3 B/M groups and then within each of these 9 portfolios we form 3 momentum groups.	3way_size_bm_mom.zip
5 size Portfolios	4 portfolios from the largest 350 firms + 1 from the rest.	5ports_size_350.zip
5 simple quintile size Portfolios	5 portfolios formed on quintiles of size.	5ports_size.zip
10 simple decile size Portfolios	10 portfolios formed on deciles of size.	10ports_size.zip
5 B/M portfolios	5 portfolios formed from B/M of the largest 350 firms.	5ports_bm_350.zip
5 simple quintile BTM Portfolios.	5 portfolios formed on quintiles of B/M of all firms.	5ports_bm.zip
10 simple decile BTM Portfolios	10 portfolios formed on deciles of B/M of all firms.	10ports_bm.zip
Negative B/M Portfolio	Portfolios formed on negative B/M stocks.	port_neg_bm.zip
25 SD portfolios	25 standard deviation portfolios formed on prior 12 month returns.	25ports_sd.zip

IMPORTANT

- **<u>NOTE 1</u>: Please cite GTC (2013) and include acknowledgement for the source of datasets in your report. If it is missed from your report, there would be a penalty on your marking.**
- **<u>NOTE 2</u>: Although GTC (2013) use datasets from 1980 to 2010, you must use the up-to-date datasets. Otherwise, there would be a penalty on your marking.**
- **<u>NOTE 3</u>: You should attach STATA codes and a log file for each task. Since the log file is sometimes too long or complicated to read it, please make it compact as much as you can.**

(TASK 1) Report the summary statistics for factors following the Table 1 of GTC (2013) and discuss results. Note that you should describe how you compute mean(%), sd(%), skewness, max(%), min(%), p50(%) and kurtosis. (**10%**)

(TASK 2) Report the summary statistics for the 25 value-weighted size and book-to-market portfolios following the Table 3 of GTC (2013) and discuss results. Note that you should describe how you compute mean(%), sd(%), skewness, max(%), min(%), p50(%) and kurtosis. (**10%**)

(TASK 3) Report the summary statistics for the 27 value-weighted size, book-to-market and momentum portfolios following the Table 4 of GTC (2013) and discuss results. Note that you should describe how you compute mean(%), sd(%), skewness, max(%), min(%), p50(%) and kurtosis. (**10%**)

(TASK 4) Report the summary statistics for the 25 value-weighted prior 12-month standard deviation portfolios following the Table 5 of GTC (2013) and discuss results. Note that you should describe how you compute mean(%), sd(%), skewness, max(%), min(%), p50(%) and kurtosis. (**10%**)

(TASK 5) Run the time-series test with the 25 size and book-to-market portfolios and report results following the Table 6 of GTC (2013). Instead of GRS test, please apply SURE and GMM tests to the portfolios. Note that you should describe how you estimate α, compute its corresponding t-test statistic, Wald test statistics using SURE and GMM, mean R^2, mean $|\alpha|$ and mean SE. (**20%**)

(TASK 6) Run the time-series test with the 27 size, book-to-market and momentum portfolios and report results following the Table 7 of GTC (2013). Instead of GRS test, please apply the SURE and GMM tests to the portfolios. Note that you should describe how you estimate α, compute its corresponding t-test statistic, Wald test statistics using SURE and GMM, mean R^2, mean $|\alpha|$ and mean SE. (**20%**)

(TASK 7) Run the time-series test with the 25 standard deviation portfolios and report results following the Table 8 of GTC (2013). Instead of the GRS test, please apply the SURE and GMM tests to the portfolios. Note that you should describe how you estimate α, compute its corresponding t-test statistic, Wald test statistics using SURE and GMM, mean R^2, mean $|\alpha|$ and mean SE. (**20%**)