Asset Pricing (Quants Finance Masters)

Group Coursework (2024/25)

(Dr Dirk Nitzsche)

Students should work in their allocated groups. The submission of the assignment has to be done via Moodle on or before the deadline.

Peer assessment applies.

Students should submit a report (not longer than 3 pages, excluding a cover sheet). The report needs to contain all the empirical results, graphs, tables as well as a discussion of the empirical findings which should be considered for grading. The report should be clearly structured and well presented, e.g. client focused. Apart from the report students can submit an Excel spreadsheet as well as other files used for the calculations (i.e. Python or other programming files).

You will have to collect some additional data from the one provided in the Excel file **cw2024AP.xlsx**.

Your investment period is from the **end of October 2014** to the **end of October 2024** – 10 years, 120 months.

Task 1 :
Collect your own data.
Use a forecasting model to decide whether you should invest in the UK stock market. Make a prediction every 6 months regarding whether you should invest in the stock market or not, starting at the end of October 2014 (then at end of April 2015, end of October 2015, end of April 2015, …). Based on your prediction you invest in the UK stock markets or the risk free investment (Task 3).

Task 2 :
Use data provided in Excel file.
Select 5 of the UK companies and calculate the efficient frontier, the market (also called optimum) portfolio and the minimum-variance portfolio every 6 months, starting at the end of October 2014 (using only information up to the end of October 2014), then at the end of April 2015 (using only information up to the end of April 2015), etc. until the end of April 2024 (using only information up to the end of April 2024). Include the efficient frontiers and key results in your report.

Task 3 :

Use data provided in Excel file.

Suppose you invest £1,000 at the end of October 2014. Calculate your terminal wealth (TW) over the 10 year investment period for the following portfolios:

- Invest in the market (i.e. optimum) portfolio weights as calculated in October 2014 without rebalancing.
- Invest in the minimum variance portfolio weights as calculated in October 2014 without rebalancing.
- Invest in the market (i.e. optimum) portfolio weights as calculated in October 2014. Rebalance every 6 months to the new market weights.
- Invest in the minimum variance portfolio weights as calculated in October 2014. Rebalance every 6 months to the new minimum variance weights.
- Invest in the FTSE All Share price index.
- Invest in the risk free rate
- Invest based on your prediction from the forecasting model (Task 1). If your prediction suggest you should invest in the stock market, invest in YOUR market portfolio (i.e. optimum portfolio) using the weights calculated using all the information available up to that point. Do not rebalance if you keep your money in the stock market for successive 6 month periods. If your prediction suggest you should not invest in the stock market you invest in the risk free asset.

Task 4 :

Write a clear, well structured, client facing report. Briefly explain your forecasting model, your stock selection and interpret all of your results. The focus should be on what those results mean for an investor. Present your empirical findings in a clear way and include practical issues of the mean-variance optimisation. Also provide a recommendation what an investor should do now if they want to invest in equity markets.

GOOD LUCK