Financial Modelling (BEAM046) Term 1 2022/3

Week 3 Tutorial Case: Active Portfolio Management

Introduction

You are the manager of the 'G7 Equity Fund', which will invest in a broad selection of large stocks in the equity markets of the G7 countries (US, UK, Japan, Germany, France, Canada and Italy). You have decided to manage this portfolio actively by applying the Black-Litterman approach. You will evaluate the active portfolio that you construct using a simple back testing procedure. In particular, you will construct the portfolio using the first four years of data (the in-sample period), and then evaluate its performance using the last year of data (the out-of-sample period). You will compare the performance of the active portfolio over the out-of-sample period with that of the tangency portfolio and the optimal passive (i.e. market) portfolio.

1. The data

You can use the return index data from the Week 2 tutorial. Ignore exchange rate fluctuations (you could assume that the currency risk is perfectly hedged). Use the return index data to compute monthly simple returns. The first four years of data will be used for portfolio construction while the last year will be used for portfolio evaluation.

2. The tangency portfolio

Use the first four years of return data to compute the covariance matrix and the mean return vector. Assume that the risk-free rate is equal to zero. Use these inputs to estimate the tangency portfolio.

3. The passive portfolio

Use the Black-Litterman approach to compute the expected returns that are implied by the market portfolio. For this you will need the market value weights of the seven countries, which are given by:

US	60.02%
UK	10.24%
Japan	12.55%
Germany	5.05%
France	5.75%
Canada	3.34%
Italy	3.05%

Assume that the expected market return is 8% per annum.

4. The active portfolio

The fund's analysts have undertaken valuations of the markets and have formed the views that Canada will outperform (relative to the market-implied expected return) by 0.10% per month, and that Italy will outperform by 0.20% per month. The analysts have neutral views over the remaining markets. Use the Black-Litterman approach to compute the adjusted expected returns. Compute the optimal active portfolio that incorporates these adjusted expected returns

5. Performance evaluation

Compute the average return, standard deviation, and Sharpe ratio of the three portfolios over the out-of-sample period.