

ECMT6003: Forecasting Stock Returns

Due: 22/May/2025 at 23:00

In this project, you are expected to conduct empirical analysis using the techniques you have learned in class. The page limit for the applied project is **5 pages**. This limit should encompass your main results along with a detailed description and their interpretation. It is encouraged to collaborate with your peers to achieve the best possible results.

Preliminaries

The technological developments allow economic relationships between countries to be less influenced by their physical distances. This triggers discussions about economic relationships between countries, not only within academia but also across industrial and public sectors. In Rapach, Strauss, and Zhou (2013, The Journal of Finance), the authors examined the relationship between US stock returns and stock returns in non-US industrialized countries, such as Australia, Canada, France, and others. They found statistically significant effects of US stock returns on non-US returns. In this applied project, we will revisit their study and try to forecast the stock returns in Australia by using the US returns. The data is available on the author's website, <http://apps.olin.wustl.edu/faculty/zhou/zpublications.html>.

The variables will be defined as follows.

- `dy_au`: log dividend-yield in Australia
- `tbill_au`: Australia's three-month Treasury bill rate
- `return_au`: monthly national currency return in Australia
- `return_us`: monthly national currency return in US

Note that, before analysis, the dividend-yield ratio need to be log-tranformed and stock returns need to be multiplied by 100. Your task is to study the predictability power of US stock return for that of Australia. In doing that, you need to do the following tasks:

- (a) Replicate the coefficient estimates of $\hat{\beta}_{AUS,b}$ and $\hat{\beta}_{AUS,d}$ in the first row of Table II in Rapach et al. (2013). Compute the Newey-West HAC estimator with lag order 4 and report the t-statistics. (Note that their t-statistics are computed by bootstrapping. Instead, obtain the t-statistic by using the HAC estimator is enough.)

- (b) Replicate the coefficient estimate $\hat{\beta}_{AUS,USA}$ in Table III of Rapach et al. (2013). Report the t-statistic computed with the HAC standard errors as in (a). Interpret your finding.
- (c) Replicate the out of sample R^2 statistic in the second column of Table VII.
- (d) Build your own model and investigate something that the authors did not report in the table, e.g., use rolling rather than recursive estimation, employ different models to predict stock returns, or add contemporaneous stocks returns in other countries which are available in the dataset. You need to clearly demonstrate the motivation of your approach.
- (e) Divide the data into training and testing sets as in (c) and compare the performance of your model with the historical average forecast. Interpret your finding.
- (f) Compare the performance of your model with the main model used in (b). Choose a statistic you would like to use for the comparison purpose. Interpret your finding.