QBUS3830
Advanced Analytics

Semester 2, 2018

Homework Task 3: The Bootstrap

1 Bootstrapping regression models

Forecasting the equity premium is one of the most important problems in empirical asset pricing. The dataset for this task is updated version of the data used by Welch and Goyal (2007), who studied this question in detail. While several predictor variables have been proposed in the literature, there is a large degree of uncertainty and instability in estimates arising from equity premium forecasting models. See Gu et al. (2018) for a recent view on measuring asset risk premia.

Use the code provided to get started. Fit a linear regression and obtain confidence intervals for the coefficients based on Central Limit Theorem. Write functions that build confidence intervals for linear regression coefficients by bootstrapping the residuals and the observations. Compute the bootstrap confidence intervals based on the data. Compare the results.

2 Rules

The code for bootstrapping the regression must be your own work. You can and should use a package to fit the linear regression.

3 Rubric

You will get the full marks if you follow the instructions and obtain the correct confidence intervals.

References

Gu, S., B. T. Kelly, and D. Xiu (2018). Empirical asset pricing via machine learning.

Welch, I. and A. Goyal (2007). A comprehensive look at the empirical performance of equity premium prediction. *The Review of Financial Studies 21*(4), 1455–1508.