Advanced Econometrics:
Forecasting and Predictability

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Tuesday 5.00 – 8.00
Edmond Safra Lecture Theater

Financial Econometrics II

- Linear Time-series Modeling (ARMA)
- Univariate Volatility Modeling
- Value-at-Risk Modeling
- Modeling Multiple Time-Series
- Correlation and Non-linear Dependence Modeling
    - All remaining components are time-series focused
    - Forecasting is a key component of each topic

- This course will focus on advanced forecast techniques
- Course divided into two components:

1. Technical indicators and data snooping
2. Forecasting in data-rich environments

Part 1: Forecast Evaluation with Many Forecasts

- Reality Check
- Test of Superior Predictive Ability
- Model Confidence Set
- Stepwise Testing
  - Examples/assignments using technical trading rules
  - Futures and equity index data

Part 2: Forecasting in Data Rich Environments

- Dynamic Factor Models
- Principle Component Regression
- The LASSO
- The Kalman Filter and missing data
- MIDAS
- Outliers and Structural Breaks
  - ▸ Examples/assignments drawn from Macro-Finance
  - ▸ Lower-frequency data: Quarterly or Monthly
  - ▸ Large number of predictors (>600)

Assessment

- Assessment will be based completely on empirical work
- Heavy use of MATLAB and data
- Focus will be on replicating and extending ideas in recent papers
- 2 Assignments
  - 1 Groups of 2 or 3 (40%)
  - 1 Individual (60%)

Selected References

1. Bajgrowicz, P. and O. Scaillet. "Technical Trading Revisited: False Discoveries, Persistence Tests, and Transaction Costs", Working paper, (2008)

2. Barras, L., O. Scaillet and R. Wermers "False discoveries in mutual fund performance: Measuring luck in estimated alphas", *Journal of Finance*, 65, (2010), 179-216.

3. Hansen, P. "A test for superior predictive ability" *Journal of Business and Economic Statistics*, (2005).

4. Hasanhodzic, J and A. Lo. "Can Hedge-Fund Returns Be Replicated?: The Linear Case". Working Paper, (2006).

5. Hastie, T., Tibshirani, R., Friedman, J. *The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition* (2009)

6. Hsu and Kuan. "Re-Examining the Profitability of Technical Analysis with White's Reality Check and Hansen's SPA Test" Working paper, (2005)

7. Rapach, Strauss and Zhou. "Out-of-Sample Equity Premium Prediction: Consistently Beating the Historical Average". 2008

8. Rossi, A. "Asset Allocation with High-Dimensional Information Sets". Working Paper (2010)

9. Sullivan, R., A. Timmermann and H. White. "Data-Snooping, Technical Trading Rule Performance, and the Bootstrap". *The Journal of Finance* 54, (1999), 1647-1691.

10. White, H., "A Reality Check for Data Snooping". *Econometrica*, (2000).