



2011 CEA Econometrics Occasional Seminars

Short course on:

LARGE DIMENSIONAL FACTOR MODELS

Lecturer: Professor Marco Lippi (University of Rome "La Sapienza", Italy)

Cass Business School, Centre for Econometrics Analysis
14-17 February 2011.

LECTURE 1.

Early use of Dynamic Factor Models in Macroeconometrics.

(14 February 2011, 15:00-18:00, Room LG003)

Suggested readings:

Geweke, J. (1977): "The Dynamic Factor Analysis of Economic Time Series," in *Latent Variables in Socio Economic Models*, ed. by D. J. Aigner and A. S. Goldberger. Amsterdam: North Holland.

Quah, D., and Sargent, T. J. (1993), "A Dynamic Index Model for Large Cross Sections", in *Business Cycles, Indicators, and Forecasting*, ed. by J. H. Stock and M. W. Watson. University of Chicago, Chicago.

Sargent, T., and C. Sims (1977): "Business Cycle Modelling without Pretending to Have too much a Priori Economic Theory," in *New Methods in Business Cycle Research*, ed. by C. Sims. Minneapolis: Federal Reserve Bank of Minneapolis.

LECTURE 2.

Large-dimensional dynamic factor models. Main differences with respect to previous models. Applications to Finance.

(15 February 2011, 15:00-18:00, Room 2006)

Suggested readings:

Chamberlain, G. (1983), "Funds, Factors, and Diversification in Arbitrage Pricing Models", *Econometrica*, 51, 5, 1305-1323

Chamberlain, G., and Rothschild, M. (1983), "Arbitrage, Factor Structure and Mean-Variance Analysis in Large Asset Markets", *Econometrica*, 51, 1305-1324.

LECTURE 3.

Recent literature on large-dimensional models and applications to Macroeconomic Modeling and Forecasting

(16 February 2011, 15:00-18:00, Room LG003)

Suggested readings:

Bai, J., and Ng, S. (2002), "Determining the Number of Factors in Approximate Factor Models", *Econometrica*, 70, 191-221.

Forni, M., Giannone, D., Lippi, M. and L. Reichlin (2009), "Opening the Black Box: Structural Factor Models with Large Cross-Sections", *Econometric Theory*, 25, 1319-1347

Forni, M., Hallin, M., Lippi, M. and L. Reichlin (2000), "The Generalized Dynamic Factor Model: Identification and Estimation", *Review of Economics and Statistics*, 82, 540-554.

Forni, M., Hallin, M., Lippi, M. and L. Reichlin (2005), "The Generalized Dynamic Factor Model: One-Sided Estimation and Forecasting", *Journal of the American Statistical Association*, 100, 830-840.

Stock, J. H., and Watson, M. W. (2002), "Forecasting Using Principal Components From a Large Number of Predictors", *Journal of the American Statistical Association*, 97, 1167-1179.

Stock, J. H., and Watson, M. W. (2005), "Implications of Dynamic Factor Models for Var Analysis", manuscript.

LECTURE 4.

Technical details. Principal component estimators in the time domain. Criteria to determine the number of factors in the static case. Spectral density matrix of a stationary stochastic vector. Principal components in the frequency domain and related estimators. Criteria to determine the number of factors in the dynamic case.

(17 February 2011, 15:00-18:00, Room 6032)

Suggested readings:

Bai, J., and Ng, S. (2002), "Determining the Number of Factors in Approximate Factor Models", *Econometrica*, 70, 191-221.

Hallin, M., Liska, R. (2007), "Determining the Number of Factors in the General Dynamic Factor Model", *Journal of the American Statistical Association*, 102, 603-617

Other References

Brillinger, D.R. (1981), "Time Series: Data Analysis and Theory", McGraw-Hill Inc., New York.

Brockwell, P.J. and Davis, R.A. (1987), "Time Series: Theory and Methods", Springer.

Organizer:

Lorenzo Trapani