**Financial Analysis and Modeling《国家金融学专题》**

**Chen Chuanglian，2025**

**1. Introduction to National Finance**

Financial Analysis and Modeling (National Finance) is a course that introduces how to use modern modeling and econometrics to predict, interpret, analysis and test relevant financial data, including DGE, DSGE, Volatility Modeling, Cointegration Modeling, VAR, TVP-VAR Models. These methods can be used to empirically test macro financial problems about fiscal policy and monetary policy. All the above modeling and estimated methods are implemented using Matlab, Oxmetrics, Stata, Eviews.

**Preliminary knowledge**

Advanced macroeconomics, advanced econometrics, advanced microeconomics, finance, programming fundamentals.

**2. Teaching objectives**

(1) Familiar with the main theories and techniques of modeling fiscal and monetary policies based on national finance.

(2) Using modern dynamic general equilibrium models, dynamic stochastic general equilibrium models, and econometric methods to construct a structural model to analyze the basic principles of fiscal and monetary policy using to regulate macro-economic operation.

**3. Teaching schedule**

The teaching schedules for this course are 9 lessons, and the teaching contents are arranged as follows:

**Introduction to National finance**

**Lecture 1 Volatility Modeling**

**Lecture 2 Cointegration Modeling**

**Lecture 3 Macro-finance modeling and application：Econometrics Ⅰ**

**Lecture 4 Macro-finance modeling and application：Econometrics Ⅱ**

**Lecture 5 Macro-finance modeling and application：DSGE**

**Lecture 6 Fiscal policy modelingⅠ**

**Lecture 7 Monetary policy modelingⅠ**

**Lecture 8 Fiscal policy modelingⅡ**

**Lecture 9 Monetary policy modelingⅡ**

**Reference**

(1) 陈创练，《金融建模：理论与实验》，北京大学出版社，2025年。

(2) Alfonso Novales et.al，《Economic Growth Theory and Numerical Solution Methods》(Chapter 3)，Springer-Verlag Berlin Heidelberg，2009.

或 阿方索等著，《经济增长：理论和数值求解方法(第2版) 》，东北财经大学出版社，2019。

(3) 陈创练，《财政金融协同的宏观调控研究：DSGE视角》，中国人民大学出版社，2024年。

**Further Reference**

1. Calvo G A. Staggered prices in a utility-maximizing framework [J]. *Journal of Monetary Economics*, 1983, 12(3): 383-398.
2. Clarida C, Gali J, and Gertler, M. Monetary policy rules and macroeconomic stability: Evidence and some theory [J]. *Quarterly Journal of Economics*, 2000, 115: 147–180.
3. Clarida R, Gali J, and Gertler M. The science of monetary policy: A new Keynesian perspective [J]. *Journal of Economic Literature*, 1999, 37(4): 1661-1707.
4. Granger C. Investigating causal relations by econometric models and cross-spectral methods [J]. *Econometrica*, 1969, 37(3): 424–438.
5. Kim C J, and Nelson C R. Estimation of a forward-looking monetary policy rule: a time-varying parameter model using ex post data [J]. *Journal of Monetary Economics*, 2006, 53: 1949-1966.
6. Koop G, Pesaran H, and Potter S. Impulse response analysis in nonlinear multivariate models [J]. *Journal of Econometrics*, 1996, 74(1): 119-147.
7. Pesarana H, and Shinb Y. Generalized impulse response analysis in linear multivariate models [J]. *Economics Letters*, 1998, 58(1): 17-29.
8. Sims C. Macroeconomis and reality [J]. *Econometrica*, 1980, 48: 1–48.
9. Tiao G C, and Box G E P. Modeling multiple time series with applications [J]. *Journal of the American Statistical Association*, 1981, 76: 802–816.
10. Bai J, and Ng S. Forecasting economic time series using targeted predictors [J]. *Journal of Econometrics*, 2008, 146(2): 304-317.
11. Banbura M, Giannone D, and Reichlin L. Large Bayesian vector auto regressions [J]. *Journal of Applied Econometrics*, 2010, 25(1): 71-92.
12. Blanchard O J, and Quah D. The dynamic effects of aggregate demand and supply disturbances [J]. *American Economic Review*, 1989, 79: 655-673.
13. Cuaresma J. C., Feldkircher M., Huber F. Forecasting with global vector autoregressive models: a Bayesian approach [J]. *Journal of Applied Econometrics*, 2016, 31(7): 1371-1391.
14. De Mol C., Giannone D. and Reichlin L. Forecasting using a large number of predictors: Is Bayesian shrinkage a valid alternative to principal components [J]. *Journal of Econometrics*, 2008, 146(2): 318-328.
15. Doan T., Litterman R. and Sims C. Forecasting and conditional projection using realistic prior distributions [J]. *Econometric Reviews*, 1984, 3(1): 1-100.
16. Engle R F, and Granger C W J. Co-integration and error correction: representation, estimation, and testing [J]. *Econometrica*, 1987, “ Vol. 55(2), 251-276.
17. Holtz-Eakin, Whitney D. N. and Harvey R. S. Estimating vector autoregressions with panel data [J]. *Econometrica*, 1988 (56): 1371-1395.
18. Litterman R B. Forecasting with Bayesian vector autoregressions: five years of experience [J]. *Journal of Business & Economic Statistics*, 1986, 4(1): 25-38.
19. Kalli M, and Griffin J E. Time-varying sparsity indynamic regression models [J]. *Journal of Business & Economic Statistics*, 2014, 32(4): 455-467.
20. Koop G. Forecasting with medium and large Bayesian VARs [J]. *Journal of Applied Econometrics*, 2013, 28(2): 177-203.
21. McCoskey S, and Kao C. A residual-based test of the null of cointegration in panel data [J]. *Econometric Reviews*, 1988, 17 (1): 57-84.
22. Park T, and Casella G. The Bayesian lasso [J]. *Journal of the American Statistical Association*, 2008, 103(482): 681-686.
23. Pesaran M H, Schuermann T, and Weiner S M. Modeling regional interdependencies using a global error-correcting macroeconometric model [J]. *Journal of Business & Economic Statistics*, 2004, 22(2): 129-162.
24. Simon G, and Zakrajšek E. Credit spreads and business cycle fluctuations [J]. *American Economic Review*, 2012, 102(4): 1692–1720.
25. Sims C A. Macroeconomics and Reality [J]. *Econometrica*, 1980, 48: 1-48.
26. Stock J H, and Watson M W. Forecasting using principal components from a large number of predictors [J]. *Journal of the American Statistical Association*, 2002, 97(460): 1167-1179.
27. Zellner A, and Chetty V K. Prediction and decision problems in regression models from the Bayesian point of view [J]. *Journal of the American Statistical Association*, 1965, 60(310): 608-616.
28. Balke N S. Credit and economic activity: credit regimes and nonlinear Propagation of Shocks [J]. *Review of Economics and Statistics*, 2000, 82(2): 344-349.
29. Hamilton J D. A new approach to the economic analysis of non-stationary time series and the business cycle [J]. *Econometrica*, 1989, 57(2): 357-384.
30. Kim C, and Nelson C R. Business cycle turning points, a new coincident index, and tests of duration dependence based on a dynamic factor model with regime switching [J]. *Review of Economics and Statistics*, 1998, 80(2): 188-201.
31. Kim C, and Nelson C R. Has the U.S. economy become more stable? A Bayesian approach based on a Markov-Switching model of the business cycle [J]. *The Review of Economics and Statistics*, 1999, 81 (4): 608–616.
32. Koop G, Pesaran H, and Potter S. Impulse response analysis in nonlinear multivariate models [J]. *Journal of Econometrics*, 1996, 74(1): 119-147.
33. Rothman P, Van Dijk D, and Franses P H. Multivariate STAR analysis of money output relationship [J]. *Macroeconomic Dynamics*, 2001, 5(4): 506-532.
34. Terasvirta T. Specification, estimation, and evaluation of smooth transition autoregressive Models [J]. *Journal of the American Statistical Association*, 1994, 89(425): 208-218.
35. Weise C L. The asymmetric effects of monetary policy: a nonlinear vector autoregression approach [J]. *Journal of Money, Credit and Banking*, 1999, 31: 85-108.
36. Bai J, and Ng S. Determining the number of factors in approximate factor models [J]. *Econometrica*, 2002, 70(1): 191-221.
37. Bernanke B S, Jean B, and Piotr E. Measuring the effects of monetary policy: a factor-augmented vector autoregressive (FAVAR) approach [J]. *The Quarterly Journal of Economics*, 2005, 120(1): 387-422.
38. Candès E J, and Tao T. The Dantzig selector: dtatistical estimation when p is much larger than n [J]. *The Annals of Statistics*, 2007, 35(6): 2313-2351.
39. Canova F, and Ciccarelli M. Estimating multi-country VAR models [J]. *International Economic Review*, 2009, 50(3): 929-959.
40. Carvalho C M, Chang J, Lucas J E, Nevins J R, Wang Q, and West M. High-dimensional sparse factor modeling: applications in gene expression genomics[J]. *Journal of the American Statistical Association*, 2008, 103,1438-1456.

Ciccarelli M, Ortega E, and Valderrama M T. Commonalities and cross-country spillovers in macroeconomic-financial linkages [J]. *The B.E. Journal of Macroeconomics*, 2016; 16(1): 231–275.

1. George E I, Sun D, and Ni S. Bayesian stochastic search for VAR model restrictions [J]. *Journal of Econometrics*, 2008, 142: 553-580.
2. Kadiyala K.R., Karlsson S. Numerical methods for estimation and inference in Bayesian VAR‐models [J]. *Journal of Applied Econometrics*, 1997, 12(2): 99-132.
3. Koop, G. and Korobili, D. Bayesian multivariate time series methods for empirical macroeconomics [J]. *Foundations and Trends in Econometrics*, 2010, Vol. 3(4): 267-358.
4. Koop G, Korobilis D. Large time-varying parameter VARs [J]. *Journal of Econometrics*, 2013, 177(2):185-198..
5. Korobilis, D. Assessing the transmission of monetary policy shocks using time-varying parameter dynamic factor models [J]. *Oxford Bulletin of Economics and Statistics*, 2013, 75: 157-179.
6. Nakajima J, and West M. Dynamic factor volatility modeling: a Bayesian latent threshold approach [J]. *Journal of Financial Econometrics*, 2013, 11: 116-153.
7. Primiceri, and Giorgio E. Time varying structural vector autoregressions and monetary policy [J]. *Review of Economic Studies*, 2005, 3: 821-852.
8. Sims C A. Macroeconomics and Reality [J]. *Econometrica*, 1980, 48(1), 1-48.
9. Calvo G A. Staggered prices in a utility-maximizing framework [J]. *Journal of Monetary Economics*, 1983, 12(3): 383-398.
10. Christiano L J, Motto R, and Rostagno M. Risk shocks [J]. *American Economic Review*, 2014, 104(1): 27-65.
11. Fujiwara I, Hirose Y, and Shintani M, Can news be a major source of aggregate fluctuations? a Bayesian DSGE approach [J]. *Journal of Money, Credit and Banking*, 2011, 43(1): 1-29.
12. Gertler M, and Kiyotaki N. Financial intermediation and credit policy in business cycle analysis [J]. *Handbook of Monetary Economics*, 2010, 3: 547-599.
13. Guerrier L, Iacoviello, and OccBin M. A toolkit for solving dynamic models with occasionally binding constraints easily [J]. *Journal of Monetary Economics*, 2015, 70 (C), 22-38.
14. Heutel G. How should environmental policy respond to business cycles? optimal policy under persistent productivity shocks[J]. *Review of Economic Dynamics*,2012,15 (2), 244-264.
15. Hopenhayn H A . Entry, exit, and firm dynamics in long run equilibrium [J]. *Econometrica*, 1992, 60(5): 1127-1150.
16. Hsieh C T, and Klenow P J. Misallocation and manufacturing TFP in China and India[J]. *The Quarterly Journal of Economics*, 2009, 124(4): 1403–1448.
17. Kaplan G, Moll B, and Violante G L. Monetary policy according to HANK [J]. *American Economic Review*, 2018, 108(3): 697-743.
18. Krusell P, and Jr A, Jr. Income and wealth heterogeneity in the macroeconomy [J]. *Journal of Political Economy*, 1998, 106(5): 867-896.
19. Krusell P, and Smith A A. Income and wealth heterogeneity, portfolio choice, and equilibrium asset returns[J]. *Macroeconomic Dynamics*, 1997, 1(2): 387-422.
20. Kydland F E, and Prescott E C. Time to build and aggregate fluctuations [J]. *Econometrica*, 1982, 50(6): 1345-1370.
21. Melitz M J. The impact of trade on intra-industry reallocations and aggregate industry productivity [J]. *Econometrica*, 2003, 71(6): 1695-1725.
22. Rotemberg J J. Sticky prices in the United States [J]. *Journal of Political Economy*, 1982, 90(6): 1187-1211.