

Multiple Time Series Analysis, SS 2016

Helmut Lütkepohl

(TA: Annika Schnücker, email: aschnuecker@diw.de)

1 Review of Univariate Time Series Analysis

1.1 Stationary and Integrated Stochastic Processes

1.2 ARIMA Processes

1.3 Estimation of ARIMA Models

1.4 Model Specification

1.5 Model Diagnostics

1.6 Forecasting

1.7 ARCH/GARCH Processes

Literature: Lütkepohl (2004), Hamilton (1994, Ch 3-5, 17)

2 Vector Autoregressive Models

2.1 VAR Processes

2.2 Forecasting

2.3 Granger-causality Analysis

2.4 Impulse Response Analysis

2.5 Estimation of VAR Models

2.5.1 OLS/GLS/ML Estimation of VARs

2.5.2 GLS Estimation of Restricted VARs

2.5.3 Bayesian Estimation

2.6 Specification of VAR Models

2.7 Model Diagnostics

2.8 Uses of Estimated VARs

Literature: Lütkepohl (2005, Chapters 2-5)

3 Cointegrated VAR Processes

3.1 Cointegration

3.2 VECMs

3.3 Estimation of VECMs

3.3.1 Multivariate Unit Root Asymptotics

3.3.2 OLS Estimation of the Cointegrated VAR(1) Model

3.3.3 Other Estimators of the Cointegrated VAR(1) Model

3.3.4 Estimation of General VECMs

3.4 Specification of VECMs

3.5 Model Diagnostics

3.6 Forecasting

3.7 Granger-causality Analysis

3.8 Impulse Response Analysis

Literature: Lütkepohl (2005, Chapters 6-8)

4 Structural Vector Autoregressive Analysis

4.1 SVARs with Restrictions on Impact Effects

4.1.1 The A-Model

4.1.2 The B-Model

4.1.3 The AB-Model

Literature: Lütkepohl (2005, Chapter 9), Breitung, Brüggemann and Lütkepohl (2004), Christiano, Eichenbaum and Evans (1999), Amisano and Giannini (1997)

4.2 Identification Through Long-Run Restrictions

4.2.1 Blanchard-Quah Model

4.2.2 Structural VECM

Literature: Lütkepohl (2005, Chapter 9), Breitung et al. (2004), Blanchard and Quah (1989), King, Plosser, Stock and Watson (1991)

4.3 The Sign Assignment Problem

Literature: Lütkepohl (2013b)

4.4 Sign Restrictions

Literature: Canova (2007), Uhlig (2005), Fry and Pagan (2011), Inoue and Kilian (2013)

4.5 Identifying SVARs via Changes in Volatility

Literature: Lütkepohl (2013a), Lütkepohl and Netšunajev (2015)

4.6 Special Topics

Literature: TBA

References

- Amisano, G. and Giannini, C. (1997). *Topics in Structural VAR Econometrics*, 2nd edn, Springer, Berlin.
- Blanchard, O. and Quah, D. (1989). The dynamic effects of aggregate demand and supply disturbances, *American Economic Review* **79**: 655–673.
- Breitung, J., Brüggemann, R. and Lütkepohl, H. (2004). Structural vector autoregressive modeling and impulse responses, in H. Lütkepohl and M. Kräzig (eds), *Applied Time Series Econometrics*, Cambridge University Press, Cambridge, pp. 159–196.
- Canova, F. (2007). *Methods for Applied Macroeconomic Research*, Princeton University Press, Princeton.
- Christiano, L. J., Eichenbaum, M. and Evans, C. (1999). Monetary policy shocks: What have we learned and to what end?, in J. B. Taylor and M. Woodford (eds), *Handbook of Macroeconomics*, Vol. 1A, Elsevier, Amsterdam, pp. 65–148.
- Fry, R. and Pagan, A. (2011). Sign restrictions in structural vector autoregressions: A critical review, *Journal of Economic Literature* **49**: 938–960.
- Hamilton, J. D. (1994). *Time Series Analysis*, Princeton University Press, Princeton, New Jersey.
- Inoue, A. and Kilian, L. (2013). Inference on impulse response functions in structural VAR models, *Journal of Econometrics* **177**: 1–13.
- King, R. G., Plosser, C. I., Stock, J. H. and Watson, M. W. (1991). Stochastic trends and economic fluctuations, *American Economic Review* **81**: 819–840.
- Lütkepohl, H. and Netšunajev, A. (2015). Structural vector autoregressions with heteroskedasticity - A comparison of different volatility models, *Discussion Paper 1464*, DIW Berlin.
- Lütkepohl, H. (2004). Univariate time series analysis, in H. Lütkepohl and M. Kräzig (eds), *Applied Time Series Econometrics*, Cambridge University Press, Cambridge, pp. 8–85.

- Lütkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*, Springer-Verlag, Berlin.
- Lütkepohl, H. (2013a). Identifying structural vector autoregressions via changes in volatility, *Advances in Econometrics* **32**: 169–203.
- Lütkepohl, H. (2013b). Reducing confidence bands for simulated impulse responses, *Statistical Papers* **54**: 1131–1145.
- Uhlig, H. (2005). What are the effects of monetary policy on output? Results from an agnostic identification procedure, *Journal of Monetary Economics* **52**: 381–419.