

**8. LATVIJAS MATEMĀTIKAS  
KONFERENCE**

Valmiera, 9.–10. aprīlis, 2010

**TĒZES**

**8<sup>th</sup> LATVIAN MATHEMATICAL  
CONFERENCE**

Valmiera, April 9–10, 2010

**ABSTRACTS**

**LATVIJAS MATEMĀTIKAS BIEDRĪBA  
VIDZEMES AUGSTSKOLA  
LATVIJAS UNIVERSITĀTE**

# ECONOMIC FORECASTS WITH BAYESIAN AUTOREGRESSIVE DISTRIBUTED LAG MODEL: CHOOSING OPTIMAL PRIOR IN ECONOMIC DOWNTURN

GINTERS BUŠS

*Central Statistical Bureau of Latvia*

Lāčplēša iela 1, Rīga LV-1301, Latvia

E-mail: [ginters.buss@csb.gov.lv](mailto:ginters.buss@csb.gov.lv)

Bayesian inference requires an analyst to set priors. Setting the right prior is crucial for precise forecasts. By using an autoregressive distributed lag (ADL) model, this paper analyzes how optimal Litterman prior changes when an economy is hit by a recession. The results show that a sharp economic slowdown changes the optimal prior in two directions. First, it changes the structure of the optimal weight prior by setting smaller weight on the lagged dependent variable compared to variables containing more recent information. Second, greater uncertainty brought by a rapid economic downturn requires more space for coefficient variation which is set by the overall tightness parameter. It is shown that the optimal overall tightness parameter may increase to such an extent that Bayesian ADL becomes equivalent to frequentist ADL.

## REFERENCES

- [1] G. Buss. Comparing Forecasts of Latvia's GDP Using Simple Seasonal ARIMA Models and Direct Versus Indirect Approach. MPRA Paper 16832, University Library of Munich, Germany, 2009.
- [2] T. Doan, R. B. Litterman and C. A. Sims. Forecasting and Conditional Projection Using Realistic Prior Distributions. *Econometric Reviews*, **3**(1): 1-100, 1984.
- [3] J. P. LeSage. *Applied Econometrics using MATLAB*, 1999.
- [4] J. P. LeSage and A. Krivelyova. A Spatial Prior for Bayesian Vector Autoregressive Models. *Journal of Regional Science*, **39**(2): 297-317, 1999.
- [5] J. P. LeSage and Z. Pan. Using Spatial Contiguity as Bayesian Prior Information in Regional Forecasting Models. *International Regional Science Review*, **18**(1): 33-53, 1995.
- [6] R. B. Litterman. Techniques of Forecasting Using Vector Autoregressions. Working Paper 115, Federal Reserve Bank of Minneapolis, 1979.
- [7] R. B. Litterman. Forecasting with Bayesian Vector Autoregressions - Five Years of Experience. *Journal of Business & Economic Statistics*, **4**(1): 25-38, 1986.
- [8] H. Theil and A. S. Goldberger. On Pure and Mixed Statistical Estimation in Economics. *International Economic Review*, **2**(1): 65-78, 1961.