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## **Time-varying vector autoregressive models with structural dynamic factors**

### *Abstract:*

This article introduces a general methodology to estimate vector autoregressive (VAR) models with time-varying coefficient matrices and conditionally heteroskedastic errors. The approach is based on combining a dynamic latent factor model for the VAR coefficient matrices with GARCH-type dynamics for the time-varying covariance of the error term. The estimation of the model can be easily performed by maximum likelihood given that the likelihood function is available in closed-form through a simple extension of the Kalman filter equations. The proposed approach is appealing since it is simple to implement and computationally fast compared to alternative Bayesian methods that are typically employed in the literature. A simulation study shows the reliability and robustness of the method against potential misspecifications of the volatility of the error term. The factor VAR is applied to model the relationship between inflation, industrial production and corporate bond spread, which describes the state of the financial market. The results show that there is time-variation in the linkage between economic and financial variables that is well described by a common factor. The impulse response analysis of financial shocks on economic output shows how financial shocks have different effects in crisis and non-crisis periods. These results are in line with previous findings in the literature.