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## ECONOMETRICS RESEARCH SEMINAR

- May 06, 2010, 9:15 am
- HSII (lecture room II, groundfloor)  
Institut für Höhere Studien  
Stumpergasse 56, 1060 Wien

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### ***“Weighted-Covariance Factor Decomposition of Varma Models Applied to U.S. Monthly-Quarterly Macroeconomic Data”***

#### **ABSTRACT**

We develop and apply a method, called weighted-covariance factor decomposition (WCFD), for reducing an estimated VARMA "data" model of observed variables being considered to a smaller VARMA "factor" model of a subset of observed variables of primary interest. Although WCFD is conceptually and computationally closely related to principal components decomposition (PCD), it has 3 notably different features: (1) whereas PCD strictly applies only to stationary data, WCFD applies without change to any mixture of stationary and nonstationary data and models; (2) whereas PCD implicitly takes a long time perspective, in WCFD the user sets a time perspective of any finite duration; (3) like PCD, WCFD can reduce data to factors, but, unlike PCD, also reduces "data" models to "factor" models. We illustrate WCFD with U.S. monthly indicators (4 coincident, 10 leading) and quarterly real GDP. We estimate 4 monthly models of 5 and 11 variables, in log and differenced-log forms, apply WCFD to the estimated models, determine the number of significant factors for each model; reduce each model to a univariate "implicit-factor" GDP model; and compare the estimated "data" and reduced "factor" models in terms of RMSEs of out-of-sample GDP forecasts. The application's main conclusion is that WCFD can reduce moderately-large monthly models of quarterly GDP and up to 10 monthly indicators to univariate monthly GDP models which can forecast out-of-sample GDP at monthly intervals about as accurately as their larger antecedent models.

with Baoline Chen (Bureau of Economic Analysis, Washington).