

Conference programme

On the occasion of the 25-th anniversary of the
Faculty of Economics and Business Administration,
Maastricht University.

FACTOR STRUCTURES FOR PANEL AND MULTIVARIATE TIME SERIES DATA

September 18th-20th

Location

Faculty of Economics and Business Administration,
Tongersestraat 53
6211 LM Maastricht
The Netherlands

Local organization

Franz C. Palm (Maastricht University)
Jean-Pierre Urbain (Maastricht University)

Programme committee

Joerg Breitung (University of Bonn)
Franz C. Palm (Maastricht University)
Jean-Pierre Urbain (Maastricht University),
Joakim Westerlund (Lund University)

Sponsors



Thursday September 18, 2008

18.00 – 20.30 **Registration and Welcome drink / reception** (Ad Fundum)

Friday September 19, 2008

(All contributed and invited sessions take place in the Aula)

09.00 - 11.00 Contributed Session I: On Nonstationarity in Panels and Multivariate Time Series. Chair: Franz Palm, Maastricht University

Stefano Fachin, Università di Roma “La Sapienza”: *Testing for Cointegration in Dependent Panels via Residual-based Bootstrap Methods*
(with Francesca Di Iorio)

Christian Gengenbach, Maastricht University: *Panel Error Correction with Global Stochastic Trends*
(with Jean-Pierre Urbain and Joakim Westerlund)

Massimo Franchi, University of Insubria: *A Condition for Co-dependence in Vector Autoregressive Processes*
(with Paolo Paruolo)

Stephan Smeekes, Maastricht University: *Cross-Sectional Dependence Robust Block Bootstrap Panel Unit Root Tests*
(with Franz Palm and Jean-Pierre Urbain)

11.00 - 11.30 Coffee break - Room: Ad Fundum

11.30 - 12.30 Invited session 1. Chair: Rainer von Sachs, Université de Louvain

Marco Lippi, Università di Roma “La Sapienza” :
The Generalized Dynamic Factor Model with Unrestricted Dynamic Loadings

12.30 - 14.30 Lunch + Poster sessions I (see below) – Room: Ad Fundum

14.30 - 15.30 Invited session 2. Chair: Geert Dhaene, K.U. Leuven

M. Hashem Pesaran, Cambridge University:
Infinite Dimensional VARs and Factor Models
(with Alexander Chudik)

15.30 - 16.00 Coffee break - Room: Ad Fundum

16.00 - 18.00 Contributed Session II: Applications. Chair: Joakim Westerlund, Lund University.

David Veredas, ECARES, Université Libre de Bruxelles: *A Monthly Volatility Index for the US Economy*
(with Cecilia Frale)

Michael Binder, Johann Wolfgang Goethe University Frankfurt: *International Investment Positions and Exchange Rate Dynamics: A Dynamic Panel Analysis*
(with Christian Offermans)

Tomaz Wieladek, Graduate Institute of International Studies Geneva: *Are Sovereign Debt Crises Fundamentals Decoupling from Global Factors?*
(with Guillermo Felices)

Marta Banbura, European Central Bank and Université Libre de Bruxelles : *Maximum Likelihood Estimation of Large Factor Model with Missing Data: Forecasting Euro Area GDP with Mixed Frequency and Short-history Indicators*
(with Michele Modugno)

19.30 - Conference dinner, Maison Du Chêne (Boschstraat 104)

Saturday September 20, 2008

(All contributed and invited sessions take place in Room HO.06)

09.00 - 11.00 Contributed Session III: On Inference in Factor Models. Chair: Peter Boswijk, University of Amsterdam.

Siem Jan Koopman, VU University Amsterdam: *Likelihood-based analysis for dynamic factor models*
(with Borus Jungbacker)

Tommaso Proietti, SEFEMEQ, University of Rome Tor Vergata : *Estimation of Common Factors under Cross-Sectional and Temporal Aggregation Constraints: Nowcasting Monthly GDP and its Main Components*

Joerg Breitung, University of Bonn: *Testing for Structural Breaks in Dynamic Factor Models*
(with Sandra Eickmeier)

Michael Eichler, University of Maastricht : *Fitting Dynamic Factor Models to Nonstationary Time Series*
(with Giovanni Motta and Rainer von Sachs)

11.00 - 11.30 Coffee break - Room: Ad Fundum

11.30 - 12.30 Invited session III. Chair: Paolo Paruolo, University of Insubria.

Mark Watson, Princeton University:
Dynamic Factor Models with Structural Instability
(with Brandon J. Bates and James H. Stock)

12.30 - 14.30 Lunch + Poster session II (see below) – Room: Ad Fundum

14.30 - 15.30 Invited session IV. Chair: Joerg Breitung, University of Bonn.

Marc Hallin, Université Libre de Bruxelles:
Dynamic Factors in the Presence of Block Structure
(with Roman Liska)

15.30 - 16.00 Coffee break - Room: Ad Fundum

16.00 - 17.00 Contributed Session IV: Factor Models in Finance. Chair: Jean-Pierre Urbain, Maastricht University.

H. Peter Boswijk, University of Amsterdam: *Testing the Number of Factors in GO-GARCH Models*
(with Roy van der Weide)

Necati Tekatli, Institute for Economic Analysis, Autonom. University of Barcelona: *Generalized Factor Models: A Bayesian Approach with Comparative Analysis*

17.00 Closing of the conference.

Poster session 1

Bernd Schwaab, Siem Jan Koopman and Andre Lucas (VU University Amsterdam)
Forecasting Cross-Sections of Frailty-correlated Default

Erik Biorn (University of Oslo)
Measurement Errors in Dynamic Panel Data Analysis: A Synthesis on Modeling and GMM Estimation

Ard den Reijer (Sveriges Riksbank), Jan Jacobs (University of Groningen) and Pieter Otter (University of Groningen):
Information, Data Dimension and Factor Structure

Syed A. Basher (Qatar Central Bank) and Josep Lluís Carrion-i-Silvestre (University of Barcelona):
Deconstructing Shocks and Persistence in OECD Real Exchange Rates

Matteo Barigozzi (Max Planck Institute for Economics, Jena, and Laboratory of Economic and Management, Sant'Anna School for Advanced Studies, Pisa) and Marco Capasso (Urban & Regional research centre Utrecht (URU), Faculty of Geosciences, Utrecht University, and Tjalling C. Koopmans Institute (TKI), Utrecht School of Economics, Utrecht University):
Nonfundamental Representations of the Relation between Technology Shocks and Hours Worked

Geert Dhaene (K.U.Leuven) and Yu Zhu (Fudan University):
Median-Type Estimation of Dynamic Panel Models with Fixed Effects

Marcus Kappler (ZEW, Mannheim):
Business Cycle Co-movement and Trade Intensity in the Euro Area: Is there a Dynamic Link?

Laura Serlenga (University of Bari) and Camilla Mastromarco (University of Salento and CESifo):
A Dynamic Efficiency Model to Test for Technological Convergence

Poster session II

Carlos Castro (ECARES, Université Libre de Bruxelles):

Estimating Default and Downgrade Risk: Sector, Region and Structured Product estimates

Markus Eberhardt (St John's College and Centre for the Study of African Economies, University of Oxford) and Francis Teal (Centre for the Study of African Economies, University of Oxford):

Modeling Technology and Technological Change in Manufacturing: How do Countries Differ?

Christoph Hanck (Maastricht University):

An Intersection Test for Panel Unit Roots

Koen Jochmans (CEMFI and K.U.Leuven) and Geert Dhaene (K.U.Leuven):

An Adjusted Profile Likelihood for Non-Stationary Panel Data Models with Incidental Parameters

Juri Marcucci (Bank of Italy):

Are Common Factors Useful in Forecasting International Stock Market Realized Variances?

Ruey Yau (National Central University, Taoyuan, Taiwan):

The Effects of Monetary Policy and Foreign Exchange Intervention: Evidence from a FAVAR Model

Michael Binder, Qianying Chen and Xuang Zhang (Johann Wolfgang Goethe University Frankfurt):

On the Effects of Monetary Policy Shocks on Exchange Rates: A GVAR Approach

Abstracts

Invited Speakers

(** = presenter)

** Marco Lippi, University of Rome “La Sapienza”

The generalized dynamic factor model with unrestricted dynamic loadings

Abstract

The generalized dynamic factor model has been extensively and successfully used in prediction (basic papers are Stock and Watson, 2002a,b, Bai and Ng, 2002, Forni, Hallin, Lippi and Reichlin, 2005). However, with no exception, the model used for prediction has a finite dimensional specification. For example, it does not accommodate a case as simple as

$$(1 - \alpha_i L)x_{it} = u_t + \xi_{it},$$

where α_i is drawn from, say, the uniform distribution between -0.9 and 0.9 , in which the factor loading obeys no restrictions. Forni, Hallin, Lippi and Reichlin (2000) have shown how to estimate the common components in the unrestricted loading case, but employ two-sided filters, which are of n order for prediction. I show that a one-sided representation of the common components in the general case can be obtained within the framework of Forni, Hallin, Lippi and Reichlin (2000). That paper provides an estimator of the spectral density matrix of the common component vector, call it $\Sigma_n^X(\theta)$, where n is the number of variables. Here I propose a method to produce a rational approximation and a one-sided factoring of $\Sigma_n^X(\theta)$. The key fact is that the spectral density matrix $\Sigma_n^X(\theta)$ has large dimension n but is highly singular, its rank being q , the number of dynamic factors, which is typically very small as compared to n . This allows piecewise rational approximation and factorization by means of low dimensional VAR models.

** M. Hashem Pesaran, Cambridge University

Alexander Chudik, Cambridge University

Infinite Dimensional VARs and Factor Models

Abstract

This paper introduces a novel approach for dealing with the ‘curse of dimensionality’ in the case of large linear dynamic systems. Restrictions on the coefficients of an unrestricted VAR are proposed that are binding only in a limit as the number of endogenous variables tends to infinity. It is shown that under such restrictions, an infinite-dimensional VAR (or IVAR) can be arbitrarily well characterized by a large number of finite-dimensional models in the spirit of the global VAR model proposed in

Pesaran et al. (JBES, 2004). The paper also considers IVAR models with dominant individual units and shows that this will lead to a dynamic factor model with the dominant unit acting as the factor. The problems of estimation and inference in a stationary IVAR with unknown number of unobserved common factors are also investigated. A cross section augmented least squares estimator is proposed and its asymptotic distribution is derived. Satisfactory small

sample properties are documented by Monte Carlo experiments. An empirical application to modelling of real GDP growth and investment-output ratios provides an illustration of the proposed approach. Considerable heterogeneities across countries and significant presence of dominant effects are found. The results also suggest that increase in investment as a share of GDP predict higher growth rate of GDP per capita for non-negligible fraction of countries and vice versa.

** Mark Watson, Princeton University
Brandon J. Bates, Harvard University
Jim Stock, Harvard University
Dynamic Factor Models with Structural Instability

Abstract

This paper studies a large-N,T approximate factor model with temporal instability in the factor loadings and in the stochastic processes for the factors and idiosyncratic errors. Sufficient conditions are given that allow for (i) consistent estimation of the factor space, (ii) consistent estimation of the number of factors, (iii) asymptotic normality of the estimated factors, and (iv) asymptotic normality of estimated coefficients in regressions models estimated using the estimated factors. Empirical examples will be presented.

** Marc Hallin, Université Libre de Bruxelles
Roman Liska, IPSC, European Commission Joint Research Centre, ISPRA, Italy
Dynamic Factors in the Presence of Block Structure

Abstract

Macroeconometric data often come under the form of large panels of time series, themselves decomposing into smaller but still quite large subpanels or blocks. We show how the dynamic factor analysis method proposed in Forni et al. (2000), combined with the identification method of Hallin and Liska (2007), allows for identifying and estimating joint and block-specific common factors. This leads to a more sophisticated analysis of the structures of dynamic interrelations within and between the blocks in such datasets, along with an informative decomposition of explained variances. The method is illustrated with an analysis of the Industrial Production Index data for France, Germany, and Italy.

**Contributed Session I:
On Nonstationarity in Panels and Multivariate Time Series**

(** = presenter)

C I.1

** Stefano Fachin, Università di Roma "La Sapienza »

Francesca Di Iorio, University of Naples Federico II

Testing for cointegration in dependent panels via residual-based bootstrap methods

Abstract

We address the issue of panel cointegration testing in dependent panels, showing by simulations that tests based on the stationary bootstrap deliver good size and power performances even with small time and cross-section sample sizes and allowing for a break at a known date. They can thus be an empirically important alternative to asymptotic methods based on the estimation of common factors. Potential extensions include test for cointegration allowing for a break in the cointegrating coefficients at an unknown date.

C I.2

** Christian Gengenbach, Maastricht University

Jean-Pierre Urbain, Maastricht University

Joakim Westerlund, Lund University

Panel Error Correction with Global Stochastic Trends

Abstract

In this paper we consider a cointegrated panel with common factors. Starting from the triangular representation of the system we develop a Granger representation theorem. We obtain the conditional ECM representation of the system which we use as a basis to propose tests for the null hypothesis of no error correction in the spirit of Westerlund (2007). In particular, we consider a t -test and a Wald test corresponding respectively to tests proposed by Banerjee et al. (1998) and Boswijk (1994) in the time series literature. We show that for each individual panel member these test statistics are asymptotically nuisance parameter free and only depend on the number of non-stationary variables in the system. However, the individual statistics are not cross sectionally independent due to the common factors, which makes pooling difficult as a conventional CLT does not apply. Nevertheless, the average of the individual statistics still converges to some distribution, which although not analytically tractable can be simulated. Thus, pooled testing is possible in spite of cross sectional dependence.

We first consider the case of observed common factors and then extend the result to the case when factors are approximated by cross sectional averages of the observed data, as suggested by Pesaran (2007).

C 1.3

** Massimo Franchi, University of Insubria

Paolo Paruolo, University of Insubria

A condition for co-dependence in vector autoregressive processes

Abstract

We give necessary and sufficient conditions that link the existence of co-dependence in vector autoregressive processes to characteristics of the minimal polynomial. It is found that these conditions are 1 to 1 to the existence of co-dependence representations of pure AR or MA type.

C 1.4

** Stephan Smeekes, Maastricht University

Franz C. Palm, Maastricht University

Jean-Pierre Urbain, Maastricht University

Cross-Sectional Dependence Robust Block Bootstrap Panel Unit Root Tests

Abstract

In this paper we consider the issue of unit root testing in cross-sectional dependent panels. We consider panels that may be characterized by various forms of cross-sectional dependence including the popular common factor framework that account for cross-sectional correlation. We consider bootstrap versions of the group-mean Im, Pesaran and Shin (2003) and the pooled Levin, Lin and Chu (2002) unit root coefficient DF- tests for panel data, originally proposed for a setting of zero cross-sectional correlation. We consider various settings (1) where the common factors and the idiosyncratic components have unit roots, (2) where only the common factors have unit roots and the idiosyncratic components are stationary (cross-sectional cointegration), and (3) where the series are stationary (alternative). We derive the asymptotic distributions of the original (asymptotic) tests for our framework and we establish the asymptotic validity of the block bootstrap variants of the two tests. In a Monte Carlo simulation, the bootstrap tests are found to have rejection frequencies that are much closer to nominal size than the rejection frequencies for the corresponding asymptotic tests. The power properties of the bootstrap tests appear comparable to those of the asymptotic tests.

Contributed Session II: Applications

(** = presenter)

C II.1

** David Veredas. ECARES - Université Libre de Bruxelles

Cecilia Frale. University of Rome, Tor Vergata

A Monthly Volatility Index for the US Economy

Abstract

We estimate the monthly volatility of the US economy from 1968 to 2006 by extending the coincident index model of Stock and Watson (1991). Our volatility index, which we call VOLINX, has four applications. First, it sheds light on the Great Moderation. VOLINX captures the decrease in the volatility in the mid-80s as well as the different episodes of stress over the sample period. In the 70s and early 80s the stagflation and the two oil crises marked the pace of the volatility whereas 09/11 is the most relevant shock after the moderation. Second, it helps to understand the economic indicators that cause volatility. While the main determinant of the coincident index is industrial production, VOLINX is mainly affected by employment and income. Third, it adapts the confidence bands of the forecasts. In and out-of-sample evaluations show that the confidence bands may differ up to 50\% with respect to a model with constant variance. Last, the methodology we use permits us to estimate monthly GDP, which has conditional volatility that is partly explained by VOLINX. These applications can be used by policy makers for monitoring and surveillance of the stress of the economy.

C II.2

** Michael Binder, Johann Wolfgang Goethe University Frankfurt

Christian Offermans, Johann Wolfgang Goethe University Frankfurt

International Investment Positions and Exchange Rate Dynamics: A Dynamic Panel Analysis

Abstract

In this paper we revisit medium- to long-run exchange rate determination, focusing on the role of international investment positions. To do so, we develop a new econometric framework accounting for conditional long-run homogeneity in heterogeneous dynamic panel data models. In particular, in our model the long-run relationship between effective exchange rates and domestic as well as weighted foreign prices is a homogeneous function of a country's international investment position. We find rather strong support for purchasing power parity in environments of limited negative net foreign asset to GDP positions, but not outside such environments. We thus argue that the purchasing power parity hypothesis holds conditionally, but not unconditionally, and that international investment positions are an essential component to characterizing this conditionality. Finally, we adduce evidence that whether deterioration of a country's net foreign asset to GDP position leads to a depreciation of that country's effective exchange rate depends on its rate of inflation relative to the rate of inflation abroad as well as its exposure to global shocks.

C II.3

Guillermo Felices, Citibank London

** Tomasz Wieladek, Graduate Institute of International Studies, Geneva

Are Sovereign Debt Crises Fundamentals Decoupling from Global Factors?

Abstract

The paper assesses the extent to which common factors drive key measures of vulnerability to sovereign debt crises in emerging market economies (EMEs) and whether this link is changing over time. We use a Bayesian Dynamic Common Factor model to estimate common components in indicators of external debt liquidity, solvency and macroeconomic performance in a sample of 33 EMEs. We find that they account on average for 50% of the variation in debt crises fundamentals. The common drivers of these measures can be associated with global economic conditions such as measures of liquidity, commodity prices and US growth. We introduce timevariation into the model to investigate whether sovereign debt crises fundamentals are becoming independent of changes in external factors over time. We find that debt crises fundamentals are as dependent on external conditions today as at the beginning of the Millennium. These conclusions are confirmed with annual data over a longer time-horizon. Broadly speaking, the answer to the question is no.

C II.4

** Marta Banbura, European Central Bank and Université Libre de Bruxelles

Michele Modugno, European Central Bank and Université Libre de Bruxelles

Maximum likelihood estimation of large factor model with missing data: forecasting euro area GDP with mixed frequency and short-history indicators

Abstract

In this paper we show how to estimate the approximate factor model for datasets with arbitrary pattern of missing data. This allows us to deal efficiently and in a fairly automatic manner with sets of indicators characterized by different frequencies, sample lengths and publication delays. We apply this methodology to nowcasting and short-term forecasting of the euro area GDP based on a large panel of monthly and quarterly data. In contrast to most of the studies which typically use only monthly series with very few or no missing observations we can also include quarterly as well as very short monthly indicators. Short sample length is indeed a relevant problem for the euro area as substantial number of series has been compiled only since recently (e.g. PMIs or services surveys). On the other hand the employment, unit labour cost and hourly labour cost variables are available only at a quarterly frequency. The empirical results show that adding quarterly and short monthly indicators can lead to improvements in forecast accuracy.

Contributed Session III: On Inference in Factor Models

(** = presenter)

C III.1

** Siem Jan Koopman, VU University Amsterdam

Borus Jungbacker, VU University Amsterdam

Likelihood-based analysis for dynamic factor models

Abstract

We present new results for the likelihood-based analysis of the dynamic factor model that possibly includes intercepts and explanatory variables. The latent factors are modeled by stochastic processes. The idiosyncratic disturbances are specified as autoregressive processes with mutually correlated innovations. The new results lead to computationally efficient procedures for the estimation of the factors and parameter estimation by (quasi-)maximum likelihood. An illustration is provided for the analysis of a large panel of macroeconomic time series.

C III.2

Tommaso Proietti, SEFEMEQ, University of Rome "Tor Vergata"

Estimation of Common Factors under Cross-Sectional and Temporal Aggregation Constraints: Nowcasting Monthly GDP and its Main Components

Abstract

The paper estimates a large-scale mixed-frequency dynamic factor model for the euro area, using monthly series along with Gross Domestic Product (GDP) and its main components, obtained from the quarterly national accounts. The latter define broad measures of real economic activity (such as GDP and its decomposition by expenditure type and by branch of activity) that we are willing to include in the factor model, in order to improve its coverage of the economy and thus the representativeness of the factors. The main problem with their inclusion is not one of model consistency, but rather of data availability and timeliness, as the national accounts series are quarterly and are available with a large publication lag. Our model is a traditional dynamic factor model formulated at the monthly frequency in terms of the stationary representation of the variables, which however becomes nonlinear when the observational constraints are taken into account. These are of two kinds: nonlinear temporal aggregation constraints, due to the fact that the model is formulated in terms of the unobserved monthly logarithmic changes, but we observe only the sum of the monthly levels within a quarter, and nonlinear cross-sectional constraints, since GDP and its main components are linked by the national accounts identities, but the series are expressed in chained volumes. The paper provides an exact treatment of the observational constraints and proposes iterative algorithms for estimating the parameters of the factor model and for signal extraction, thereby producing nowcasts of monthly gross domestic product and its main components, as well as measures of their reliability.

C III.3

** Joerg Breitung, University of Bonn, Germany
Sandra Eickmeier, Deutsche Bundesbank, Frankfurt
Testing for structural breaks in dynamic factor models

Abstract

From time to time, economies undergo far-reaching structural changes. These changes give rise to the conjecture that the parameters of dynamic factor models are not constant over time. In this paper we investigate the consequences of structural breaks in the factor loadings for the specification and estimation of factor models based on principal components (PC) and suggest test procedures for structural breaks. It is shown that structural breaks severely inflate the number of factors identified by the usual information criteria. Although the common factors can be estimated consistently with PC even under (mild) time variation in the factor loadings, the PC estimator of the factor loadings is inconsistent. Based on the strict factor model the hypothesis of a structural break is tested by using Likelihood-Ratio, Lagrange-Multiplier and Wald statistics. The LM test which is shown to perform best in our Monte Carlo simulations is generalized to factor models where the common factors and idiosyncratic components are serially correlated. We also apply the suggested test procedure to a US dataset used in Stock and Watson (2005) and a euro-area dataset described in Altissimo et al. (2007). We find evidence that the beginning of the so-called Great Moderation in the US as well as the Maastricht treaty and the handover of monetary policy from the European national central banks to the ECB coincide with structural breaks in the factor loadings. Ignoring these breaks may yield misleading results if the empirical analysis focuses on the interpretation of common factors or on the transmission of common shocks to the variables of interest.

C III.4

Michael Eichler, Maastricht University
Giovanni Motta, Université Catholique de Louvain
Rainer von Sachs, Université Catholique de Louvain
Fitting dynamic factor models to nonstationary time series

Abstract

In this paper we propose a factor model with infinite dynamics characterized by a nonstationary behavior and nonorthogonal idiosyncratic components as in a static approximate factor model. This model generalizes the class of dynamic factor models as well as the class of nonstationary factor models. In the stationary case, the common components of a dynamic factor model can be estimated by the eigenvectors of a consistent estimator of the spectral density matrix. In the nonstationary framework the dynamics of the model is explained by a time-varying spectral density matrix. In this paper we show that the common components of a nonstationary dynamic factor model can be estimated consistently by the eigenvectors of a consistent estimator of the time-varying spectral density matrix.

Contributed Session IV: Factor Models in Finance

(** = presenter)

C IV.1

** H. Peter Boswijk, University of Amsterdam

Roy van der Weide, World Bank

Testing the number of factors in GO-GARCH models

Abstract

We propose two tests for the number of heteroskedastic factors in a generalized orthogonal GARCH (GO-GARCH) model. The first test is the Gaussian likelihood ratio test, the second is a reduced rank test applied to suitably defined autocovariance matrices. We characterize the asymptotic null distributions of the tests, and compare their finite sample size and power properties to an alternative test proposed by Lanne and Saikkonen (2007).

C IV.2

** Necati Tekatli, Institute for Economic Analysis, CSIC, Autonom. University of Barcelona

Generalized Factor Models: A Bayesian Approach with Comparative Analysis

Abstract

There is recent interest in the generalization of classical factor models in which the idiosyncratic factors are assumed to be orthogonal and there are identification restrictions on cross-sectional and time dimensions. In this study, we describe and implement a Bayesian approach to generalized factor models. A flexible framework is developed to determine the variations attributed to common and idiosyncratic factors. We also propose a unique methodology to select the (generalized) factor model that best fits a given set of data. Applying the proposed methodology to the simulated data and the foreign exchange rate data, we provide a comparative analysis between the classical and generalized factor models. We find that when there is a shift from classical to generalized, there are significant changes in the estimates of the structures of the covariance and correlation matrices while there are less dramatic changes in the estimates of the factor loadings and the variation attributed to common factors.

Poster sessions:

P.1

Bernd Schwaab, VU University Amsterdam

Siem Jan Koopman, VU University Amsterdam

Andre Lucas, VU University Amsterdam

Forecasting Cross-Sections of Frailty-correlated Default

Abstract

We propose a novel econometric model for estimating and forecasting cross-sections of time-varying conditional default probabilities. The model captures the systematic variation in corporate default counts across e.g. rating and industry groups by using dynamic factors from a large panel of selected macroeconomic and financial data as well as common unobserved risk factors. All factors are statistically and economically significant and together capture a large part of the time-variation in observed default rates. In this framework we improve the out-of-sample forecasting accuracy associated with conditional default probabilities by about 10-35% in terms of Mean Absolute Error, particularly in years of default stress.

P.2

Erik Biorn, University of Oslo

Measurement Errors in Dynamic Panel Data Analysis: A Synthesis on Modeling and GMM Estimation

Abstract

A panel data model which combines an autoregressive fixed effects panel data equation and a static equation with measurement errors is considered. Examples of models for pure time series data with errors in variables are the starting point. Two versions of the Generalized Method of Moments (GMM) for this panel data model are considered, with fixed effects accounted for by, respectively, (i) transforming the equation to differences and keeping the instruments in levels, (ii) keeping the equation in levels and transforming the instruments to differences. In specifying the set of valid moment conditions and instrument sets, patterns with finite memory of disturbances, of latent regressors and of the measurement errors are discussed. Focus is on examining how the potential instrument sets which satisfy both the rank conditions for the instrumented variables and the orthogonality conditions for the composite errors and disturbances, change when the model's memory pattern changes. Sometimes the joint occurrence of measurement errors and long memories implies that the potential instrument sets becomes too small to make consistent estimation possible.

P.3

Ard den Reijer, Sveriges Riksbank
Jan Jacobs, University of Groningen
Pieter Otter, University of Groningen
Information, data dimension and factor structure

Abstract

This paper employs concepts from information theory to choosing the dimension of a data set. We propose two relative information measures, which are connected to Kullback-Leibler numbers. By ordering the series of the data set according to these measures, we are able to obtain a subset of the data set that is most informative to model a variable of interest. The method can be used as a first step in the construction of a dynamic factor model or a leading index, as illustrated with a macroeconomic data set on The Netherlands.

P.4

Syed A. Basher, Qatar Central Bank
Josep Lluís Carrion-i-Silvestre, University of Barcelona
Deconstructing Shocks and Persistence in OECD Real Exchange Rates

Abstract

This paper analyzes the persistence of shocks that affect the real exchange rates for a panel of seventeen OECD developed countries during the post-Bretton Woods era. The adoption of a panel data framework allows us to distinguish two different sources of shocks, i.e. the idiosyncratic and the common shocks, each of which may have different persistence patterns on the real exchange rates. We first investigate the stochastic properties of the panel data set using panel stationarity tests that simultaneously consider both the presence of cross-section dependence and multiple structural breaks that have not received much attention in previous persistence analyses. Empirical results indicate that real exchange rates are non-stationary when the analysis does not account for structural breaks, although this conclusion is reversed when they are modeled. Consequently, misspecification errors due to the non-consideration of structural breaks leads to upward biased shocks' persistence measures. The persistence measures for the idiosyncratic and common shocks have been estimated in this paper always turn out to be less than one year.

P.5

Matteo Barigozzi, Max Planck Institute for Economics, Jena, and Laboratory of Economic and Management, Sant'Anna School for Advanced Studies, Pisa.

Marco Capasso, Urban & Regional research centre Utrecht (URU), Faculty of Geosciences, Utrecht University, and Tjalling C. Koopmans Institute (TKI), Utrecht School of Economics, Utrecht University.

Nonfundamental representations of the relation between technology shocks and hours worked

Abstract

Estimating the response of hours worked to technology shocks is often considered as a crucial step for evaluating the applicability of macroeconomic models to reality. In particular, Galí [1999] has considered the conditional correlation between employment and productivity as a key tool for building an empirical evaluation of Real Business Cycle theories and New-Keynesian models. Impulse-response functions are often identified by means of Structural Vector AutoRegressive models. However, a structural Moving Average model of the economy cannot be estimated by VAR techniques whenever the agents' information space is larger than the econometrician's one, that is when we face a problem of nonfundamentalness. We consider how factor models can be seen as an alternative to VAR for assessing the validity of an economic model without having to deal with the problem of nonfundamentalness. We apply this method to the well known business cycle model by Galí [1999], which originally was estimated using a VAR, and retrieve alternative nonfundamental representations of the relation between technology shocks and hours worked. Such representations always yield a positive correlation between productivity and hours worked when conditioning on a technology shock. This result is more robust than the results by Christiano et al. [2004], because it is independent of the transformation used for hours worked and moreover is perfectly consistent with the unconditional correlation observed between the common components of the variables considered.

P.6

Geert Dhaene, K.U.Leuven

Yu Zhu, Fudan University

Median-Type Estimation of Dynamic Panel Models with Fixed Effects

Abstract

We propose median-type moment conditions for the estimation of linear dynamic fixed effects models from large N , small T panels. The estimators, defined through sample medians, are consistent as N grows large while T remains fixed, and are robust to outlier contamination. Conventional GMM estimates, in contrast, are not robust to outliers. In the simple setting of estimating the AR(1) coefficient from stationary Gaussian data, the median-type estimator is (a linear transformation of) the median of the ratios D_{it}/D_{it-1} . The estimator is exactly unbiased and nearly median-unbiased (for fixed N and T) when there is no contamination, and has bounded influence function when the data are contaminated by independent or patched additive outliers. We derive the influence function and the gross-error sensitivity explicitly. Under independent additive outlier contamination, the estimator is asymptotically biased towards zero but remains sign-robust (hence its breakdown point is 1), regardless of the contamination rate and the outlier distribution.

P.7

Marcus Kappler, Centre for European Economic Research (ZEW) Mannheim

Business Cycle Co-movement and Trade Intensity in the Euro Area: Is there a Dynamic Link?

Abstract

This paper extends the recent literature that exclusively looks at the static link between bilateral trade intensity and business cycle synchronisation. A panel VAR framework with an unobserved common factor structure is used in order to apply the concept of Granger causality to test for dynamic links between variables. We conclude that although countries with intensive trade linkages also tend to have more similar business cycle in the long-run, the trade channel does not help to explain much of the short-run variation of business cycle co-movement in the euro area. These results are robust with respect to different measures of business cycle co-movement and bilateral trade intensity.

P.8

Laura Serlenga, University of Bari

Camilla Mastromarco, University of Salento and CESifo

A Dynamic Efficiency Model To Test for Technological Convergence

Abstract

This paper represents an important attempt to consider time delays in the adjustment process of efficiency. We propose a new approach to estimate stochastic frontier model with dynamic adjustments of efficiency. Our aim is to better disentangle causes and determinants of technological convergence. We follow recent developments of panel data studies and implement a factor model that allows for a certain degree of cross section dependence through unobserved heterogeneous time-specific effects. The estimation methodology proposed focuses on dynamic adjustments towards the technological frontier. Empirical results support the evidence of a slow technological catching-up process towards the frontier among 24 OECD countries over the observed period 1970-2005. Our findings demonstrate the importance of including short-term economic fluctuations in a stochastic frontier framework.

P.9

Carlos Castro, ECARES, Universite Libre de Bruxelles, Belgium

Estimating Default and Downgrade Risk: Sector, Region and Structured Product estimates

Abstract

In this paper Moody's databases, of corporate issuers of long term bonds and structured products, are used to estimate asset/default correlations across a group of sectors, world regions and products. The estimation is performed with the dynamic factor model for default risk proposed in Koopman, Lucas and Daniels (2005) and in McNeil and Wendin (2006). The results show significant differences in the estimated asset/default correlations across groups.

These findings are in line with some of the objectives of the Basel 2 accord, along the lines of accounting as much as possible for the heterogeneity of the issuers, in credit portfolio analysis.

P.10

Markus Eberhardt, St John's College and Centre for the Study of African Economies, University of Oxford

Francis Teal, Centre for the Study of African Economies, University of Oxford

Modeling Technology and Technological Change in Manufacturing: How do Countries Differ?

Abstract

In this paper we ask how technological differences in manufacturing across countries can best be modeled when using a standard production function approach. We show that it is important to allow for differences in technology as measured by differences in parameters. Of similar importance are time-series properties of the data and the role of dynamic processes, which can be thought of as aspects of technological change. Regarding the latter we identify both an element that is common across all countries and a part which is country-specific. The estimator we develop, which we term the Augmented Mean Group estimator (AMG), is closely related to the Mean Group version of the Pesaran (2006) Common Correlated Effects estimator (CCEMG) and accounts for cross-section dependence in the panel. Once we allow for parameter heterogeneity and the underlying time-series properties of the data we are able to show that the parameter estimates from the production function are consistent with information on factor shares.

P.11

Christoph Hanck, Maastricht University

An Intersection Test for Panel Unit Roots

Abstract

This paper proposes a new panel unit root test based on Simes' [Biometrika 1986, "An Improved Bonferroni Procedure for Multiple Tests of Significance"] classical intersection test. The test is robust to general patterns of cross-sectional dependence and yet straightforward to implement, only requiring p-values of time series unit root tests of the series in the panel, and no resampling. Monte Carlo experiments show good size and power properties relative to existing panel unit root tests. Unlike previously suggested tests, the new test allows to identify the units in the panel for which the alternative of stationarity can be said to hold. We provide two empirical applications to panels of real gross domestic product (GDP) and real exchange rate data.

P.13

Koen Jochmans, CEMFI and K.U.Leuven

Geert Dhaene, K.U.Leuven

An Adjusted Profile Likelihood for Non-Stationary Panel Data Models with Incidental Parameters

Abstract

We calculate the exact bias of the profile score for the first-order autoregressive parameter, ρ , in a Gaussian $N \times T$ panel data model with arbitrary initial conditions and arbitrary heterogeneity in intercepts, trends and error variances. The bias is a polynomial in ρ and does not depend on the initial values or the incidental parameters. Subtracting its integral from the profile loglikelihood leads to an adjusted profile likelihood which, in the case without incidental trends and error variances, coincides with Lancaster's (2002) marginal posterior density for ρ . We show, largely by simulation, that the expected adjusted profile loglikelihood (and hence the expected marginal posterior log-density), in addition to attaining a local maximum on $[-1, 1]$ at the true value of ρ , may attain a global maximum at 1. The latter occurs when the initial values are strong inliers relative to the stationary distribution, which leads to weakly informative data when the autoregressive parameter is moderate to large, even with very large N .

P.14

Juri Marcucci, Bank of Italy

Are common factors useful in forecasting international stock market realized variances?

Abstract

In this paper we compare standard univariate time series models and multivariate factor models in terms of their ability to forecast the realized variances of a group of international stock exchanges. We also try to assess to which extent the use of common pure variance factors helps in forecasting the univariate volatilities of each single stock market, exploiting the comovements among them. Our results show that models with equally weighted regional factors tend to outperform. In addition, models that use variance factors obtained from the canonical variates tend to outperform all the others that utilize different multivariate techniques confirming the predicting power of canonical correlation analysis.

P.15

Ruey Yau, National Central University, Taoyuan, Taiwan

The Effects of Monetary Policy and Foreign Exchange Intervention: Evidence from a FAVAR Model

Abstract

This paper examines the effects of monetary policy and foreign exchange intervention policy for the U.S. in a data-rich environment. A Factor-Augmented Vector Autoregression (FAVAR) model is employed to conduct the impulse response analysis and forecasts error variance decomposition for the two types of policy innovations. This econometric method helps us to identify a few underlying structural shocks that cause the two policy variables to respond to.

These common structural shocks include one shock to real output, one shock to prices, one shock to exchange rates, and one shock to interest rates and monetary aggregates. Factor-based monetary policy rule and intervention policy rule are obtained under this framework. We find that U.S. intervention policy is not fully-sterilized and the delayed overshooting is not observed.

P.17

Michael Binder, Qianying Chen, Xuang Zhang, Johann Wolfgang Goethe University Frankfurt
On the effects of monetary policy shocks on exchange rates: A GVAR approach

Abstract

It appears difficult to answer the question of how a change in a central bank's monetary policy affects the external value of its currency. From the perspective of economic theory, the long-standing answer used to be based on Dornbusch's (1976) work, predicting that in response to a contraction of domestic monetary policy, the exchange rate will exhibit an immediate appreciation, followed by a gradual depreciation until the long-run equilibrium involving overall appreciation in line with purchasing power parity is reached, that is, the exchange rate overshooting theory. Recent theoretical literature has re-examined this issue on the basis of dynamic stochastic general equilibrium models. Benigno (2004) argues that the dynamic adjustment pattern of the exchange rate after a monetary policy shock depends on the relative degrees of price stickiness in the domestic and foreign economies, as well as their monetary policy regimes. Steinsson (2008) argues that the impulse response function for the real exchange rate exhibits overshooting during the first one or two months after the monetary policy shock, and thereafter decays exponentially, consistent with Dornbusch (1976).

The empirical literature, on the other hand, has for various countries documented that the exchange rate will depreciate rather than appreciate in response to a monetary policy contraction, the so called the "exchange rate puzzle". When appreciate on does occur, it typically does not occur immediately but the impulse response function rather exhibits a hump-shape pattern, the so called "delayed overshooting puzzle".

Finally, there appears to be no evidence in favor of (uncovered) interest parity, which has been termed the "forward premium puzzle", and domestic prices appear to fall rather than rise after a contractionary monetary policy shock, which has been termed the "price puzzle".

The common framework for this empirical work have been bilateral vector autoregressions (VARs) incorporating key macroeconomic variables for the domestic and foreign economies, identifying the effects of a domestic monetary policy shock on the bilateral exchange rate. considered on the basis of a Cholesky decomposition involving a Wold recursive ordering of the VAR variables. Recent empirical work employing weak identification schemes such as sign restrictions, for example Scholl and Uhlig (2007), argues that the puzzles are not tied to the identification of VARs using Cholesky decompositions.

In this paper, we address the question to what extent the previous empirical findings may have been caused by working with separate bilateral VARs that neglect to account for simultaneous multi-country adjustments of the key macroeconomic variables. In a globalizing world economy, capturing the multilateral nature of crosscountry spillovers seems of prime importance. Furthermore, in regards to identifying monetary policy shocks, we rely as much as

possible on long-run restrictions, avoiding difficult to justify effective short-run restrictions. In particular, we consider a panel comprising nine industrial economies (Australia, Canada, France, Germany, Italy, Japan, New Zealand, United Kingdom, and the United States), using monthly data from 1978 to 2006.