



# RESEARCH NEWS

2006:2

APP/Forskningsenheten, editor: Peter Sellin, Ph. 7870652

## News from the Research Division

### People at the Research Division

**Tor Jacobson**, head of research (econometrics, bank- and creditrisks)

**Kasper Roszbach**, deputy head of research (micro-econometrics, bank- and creditrisks)

**Malin Adolfson**, researcher (international macroeconomics, monetary policy)

**Sophie Claeys**, researcher (empirical banking)

**Mikael Carlsson**, researcher (macroeconomics, econometrics)

**Paolo Giordani**, researcher (Bayesian econometrics, forecasting, monetary policy, exchange rates)

**Mathias Trabandt**, researcher (monetary economics, public economics)

**Mattias Villani**, researcher (Bayesian analysis, econometrics, forecasting)

**Karl Walentin**, researcher (macroeconomics, financial economics)

**Erik von Schedvin**, research assistant

**Rickard Sandberg**, guest researcher

**Lena Löfgren**, secretary

### Guest program

During the second half of 2006 the following researchers visited the Research Division: Franklin Allen (Wharton School, University of Pennsylvania), Dan Waggoner (Federal Reserve Bank of Atlanta), Robert Kohn (University of New South Wales), Stefan Norrbin (Florida State University), Satyajit Chatterjee (Federal Reserve Bank of Philadelphia), Matteo Iacoviello (Boston College), Bent Vale (Norges Bank), and Morten Bech (Federal Reserve Bank of New York).

During the first half of 2007 we expect visits from the following researchers:

- Lars E.O. Svensson (Princeton University). Research areas: Monetary policy.
- Kjell Björn Nordal (Norges Bank). Research areas: Banking.

- Erik Hjalmarsson (Board of Governors). Research areas: Financial markets, econometrics and international finance.
- Hans Degryse (Tilburg University). Research areas: Banking, market microstructure and the industrial organisation of financial markets.
- Steven Ongena (Tilburg University). Research areas: Empirical banking.
- Antonella Trigari (Bocconi University). Research areas: Labour markets, wage setting and unemployment dynamics in equilibrium business cycle models.

*For questions regarding the guest program please contact Kasper Roszbach; Ph. 7870823.*

### Changes in the research staff

Mathias Trabandt joined the permanent research staff in December 2006. Mathias is expected to receive his Ph.D. from Humboldt University Berlin in spring 2007. His main research interests focus on the fields of monetary economics and public economics. For example, he analyzes the consequences of information stickiness versus price stickiness in general equilibrium. Further, he explores the positions of the US and EU-15 on their Laffer curves and examines the pre-announcement effects of tax reforms.

Malin Adolfson spent the second half of 2006 at the European Central Bank. She visited DG-R/Econometric modelling as an ESCB/IO Expert, where she has been involved in the development and estimation of the New Area Wide Model.

Jesper Lindé left the Research Division in September to become head of the Model Division. He will now be in charge of running the DSGE model for the Swedish economy, which he developed together with Malin Adolfson, Stefan Laséen and Mattias Villani.

Stefan Palmqvist from the Monetary Policy Department spent the fall at the Research Division. During this time he worked on two papers on imperfect competition (on the goods and labor market, respectively) and the consequences for inflation. He also started a project that deals with combining model-based forecasts and judgment, a project that is joint work with Michael Andersson of the Forecasting Division and Dan Waggoner of the Federal Reserve Bank of Atlanta.

Rickard Sandberg joined the Research Division as a guest researcher in October. He received his Ph.D. from the Stockholm School of Economics (SSE) in the autumn of 2004. He was then a visiting fellow at University of Technology Sydney and thereafter at the University of Cambridge. During 2005 he also received the Wallander Post-Doctorial scholarship. In 2006 he was employed as an assistant professor at SSE and the Department of Economic Statistics and Decision Support. His main interests lay within econometric theory and nonlinear time series and panel data models with applications to the term structure of interest rates. Currently he is involved in a project on nonlinear cointegration with Pentti Saikkonen (University of Helsinki) and Changli He (SSE). He has published work on testing the unit root hypothesis in nonlinear time series models.

Gabriela Guibourg has moved to the Applied Research Division as from February 1. She will conduct in depth studies in areas related to monetary policy and write background material for speeches held by the Executive Board members. During her time at the Research Division, she studied the demand for cash in Sweden that derives from unrecorded transactions and estimated the size and the evolution of the shadow economy in Sweden in 1990-2004. This was a joint project together with Björn Segendorf from the International Secretariat. In a second project, she estimated the social and private costs for cash and card payments and the breakeven-point in terms of transaction size above (below) which a card payment is more (less) cost efficient than a cash payments. This was compared with consumers' actual choice between cash and card payments as function of transaction size. The was a joint project with Björn Segendorf and with Mats Bergman from the Swedish Competition Authority.

Peter Sellin has returned to the Financial Markets Division after having spent nine months at the Research Division. During this time he developed a new exchange rate forecasting model, which was handed over to the Forecasting Division.

Erik von Schedvin replaced Rikard Nilsson as research assistant, after Rikard left the bank to pursue a career at Svenska Handelsbanken. Erik has a B.A. in economics from the Department of Economics at Stockholm University. He is currently working on his Msc thesis in mathematical statistics at the Department of Mathematics.

## Research projects

### *Credit risk*

The credit risk project was initiated in 1999. The Riksbank has an obvious interest in ensuring that commercial banks use good risk management models. Another driving force behind the project has been the Basel II accord.

In the early phase of the project the focus was on methods for modelling extreme portfolio risks. After having concluded a number of ongoing research projects within this area, the project is now focusing on the following areas:

1. Acquisition and structuring of additional data bases.
  2. The impact of fluctuations in the macroeconomy on corporate bankruptcies.
  3. Modelling of correlation and concentration risks.
1. One goal is to acquire new data from banks that we have previously collaborated with but also to acquire data from banks that earlier have not had the technical ability to provide these data. At the same time we strive to standardize the inputting of data, so that in future updating the data base will be easier.
  2. Three studies of the relation between aggregate fluctuations and default probabilities are planned. "*Aggregate fluctuations and business default*" investigates to what extent aggregate fluctuations influences the frequency of default contingent upon both firm specific and industry specific information. The model's forecasts are evaluated and compared to the best practice models in the field. "*SME and corporate exposure to business cycle risk*" focus on the differences in risk between small and large companies. The motivation for this project is the Basle II Accord's favourable treatment of *retail credit* and loans to *SMEs*. The justification is less exposure to systematic risk and more exposure to idiosyncratic risk in these categories. However, several studies have found that these categories are more risky than *corporate credit*, but without finding the reason for this. The study proposed here will try to pin down the reason for the difference between the risk in small and large firms' credit risk. "*Stress testing and macroeconomic fluctuations*" is a joint project with researchers from the Federal Reserve Bank of New York and the Cambridge University. It develops a method to link portfolio risk to global output shocks.
  3. Two studies focus on concentration risks and correlations. "*Is firm interdependence within industries important for portfolio credit risk?*" tries to formalize that many firms are affected by each other through judicial, financial and business relations. Conventional methods, such as KMV, do not take into account correlations due to such interactions and can therefore potentially underestimate the credit risk in the banking system. This study develops a new way of incorporating industry specific shocks. An experiment with data from two Swedish banks estimates credit-VaR. The study will be completed in 2007. A new study, "*Industry effects and business default*" continues this work and develops a more advanced method that allows the shocks that firms are subjected to to be contingent on what happens in other industries. The aim of this study is to give a more insightful decomposition of the sources of credit risk.

### ***ALLV Dynamic Stochastic General Equilibrium model***

Several papers have already been accepted for publication or are in the final stages of revision. This is still an active research project, but it now enters a calmer phase. The following projects will be pursued during 2007:

***Optimal monetary policy in an operational medium-size model.*** The purpose is to show how to do optimal policy simulations in a medium sized open economy DSGE model. Optimal policy simulations are policy simulations that minimize an intertemporal quadratic loss function representing flexible inflation targeting. Optimal policy simulations for alternative sets of loss-function parameters provide the monetary policy committee with a set of efficient policy alternatives. Such a set of policy alternatives can be seen as the efficient frontier of the set of feasible policy alternatives. We exemplify by contrasting the optimal projections with the forecasts using a Taylor type reaction function. This gives an assessment of the importance of the monetary policy conducted in a modern open economy DSGE model.

***Parameter identification in an open economy DSGE model.*** This paper addresses identification issues in open economy DSGE models using simulated data from an (estimated) medium sized model of the Swedish economy. We examine to which extent maximum likelihood methods can extract the true parameters in our model using Monte Carlo methods.

***Efficient analysis of Bayesian DSGE models.*** The Riksbank's RAMSES model is analysed with the aid of modern statistical methods. However, RAMSES size and complexity implies that this analysis is quite time consuming. This makes development and maintenance of the model, as well as the daily analysis and forecasting chores, that much harder. The aim of this project is to develop more efficient, i.e., less time consuming, Bayesian algorithms for DSGE models in general and for the RAMSES model in particular.

### ***Financial markets***

This is a project that brings together a number of studies on financial markets that are not included in the credit risk project. This project is composed of three different parts:

The first part consists of two studies that use small calibrated general equilibrium models. *"Earnings inequality and stock prices"* develops a model for analyzing how share prices are affected by growing wage inequality. When households that own shares get higher labor incomes they will be prepared to take on greater risk. This implies that share prices will increase. The model purports to explain the sharp increase in share prices in the United States since 1980. *"Expectation driven business cycles with limited enforcement"* explores the effect of shocks to expected future productivity in an economy where firms face borrowing constraints. Perhaps surprisingly, the standard models in the literature do not imply increasing stock prices in response to positive news about the future. The introduction of borrowing constraints solves this problem.

The second part consists of three studies. *"Foreign bank entry in the EU: the impact on the structure and organisation of supervisory authorities"* takes as its departure the supposition that European integration of the banking market in combination with delegated supervision could lead to a financial stability problem. The study investigates what a national supervisory agent can do when a foreign bank fails. This should be of special interest for the new member countries whose banking market is often dominated by foreign banks. *"The impact of the mode of foreign bank entry on bank lending rates"* analysis how different entry forms for banks affect the pricing on the credit market. *"Earning management in banking"* claims that the measures used to evaluate banks can be substandard because of inadequacies in the reporting and capital adequacy rules. This hypothesis is tested by verifying if banks' reporting reliability is positively affected by stricter rules and stricter implementation of existing rules.

The third part is a collaboration with researchers at the Federal Reserve Bank of Philadelphia. It studies the banks' effectiveness in the monitoring of its borrowers. *"Credit ratings and bank monitoring ability"* investigates to what extent Swedish banks are superior to external rating agencies in the monitoring of corporate creditworthiness. *"Loan monitoring"* studies how banks

react to small violations of the credit agreements. Among other things, how banks change the maturity of the loans or even force the borrower into bankruptcy is investigated.

### ***Labour market***

The overarching aim of this project is to deepen our knowledge about the interaction between the labour market and macroeconomic outcomes, and the role played by stabilisation policy. Recently important steps have been taken in the development and estimation of Dynamic Stochastic General Equilibrium models (DSGE). However, the labour market in this type of models have to date been modelled in a very stylized way. This is not because one believes that the labour market is unimportant for macroeconomic outcomes, but rather due to the technical complexity of such modelling. Not only does this simplified view of the labour market prohibit the analysis of a number of important issues, it also implies strong restrictions on DSGE models when confronted with data.

A first study, already started, involves modelling wage bargaining between employers and unions. This would make it possible to analyse such issues as how labour market institutions affects the economy's dynamics and what the role is for stabilisation policy in this framework.

A second, also started, study takes its departure in the empirical observation that nominal wages almost never falls. This observation can be explained in a wage negotiation model if the parties face asymmetric costs of conflict. By adapting the model developed in the first study we can study the effects of downward rigid nominal wages and the possible role and scope for stabilisation policy.

A third study involves taking the model developed in the first study to the data. This would be interesting, not only because we could then estimate structural parameters governing labour market outcomes, but also because a less restrictive modelling of the labour market would presumably affect the empirical results in other dimensions of the model as well.

The second and third approaches described above implies a macroeconomic evaluation of the microfoundations on which the DSGE model stands. An alternative approach is to start from the micro level and use micro data. Sveriges Riksbank/APP has acquired a very rich microeconomic data-base of firms and their employees that is well suited for the task at hand.

A fourth study, which is already at an advanced state, aims at evaluating the empirical relevance of different models of the labour market (search models vs. effective wage models and bargaining models) in terms of their implications for job creation, using the micro data-base.

A fifth study will involve studying the dynamics between price setting and labour costs ( and other factor costs) with the aid of the Riksbank's micro database. The idea is to collect stylized facts about the structural workings of the economy to be used for further theoretical work.

The studies 1-4 will be conducted in collaboration with researchers at Uppsala University. Study 5 will be a collaborative effort together with staff at the APP/Utredningsenheten within the framework of "The Eurosystem Wage Dynamics Network".

### ***Bayesian analysis of structural changes***

Economic time series are usually modelled under the maintained assumption that the underlying economic process does not change over time. Specifically, one usually assumes that the level, persistence and volatility of the time series are constant over time. To meet this assumption the models are usually estimated for a sample period when the economy was relatively stable. For example, it is customary to estimate macroeconomic models starting in the beginning or middle of the 1980s, or even from the start of inflation targeting. More seasoned data will not be used at all even though they could contain valuable information. This approach can be especially problematic when the economy relatively recently has undergone a structural shift, or if such a change has taken place gradually. It could also be the case that the economy has changed in some regards, but in others have remained quite stable for a long period of time.

This project will develop Bayesian statistical methods with the aim of discovering and modelling possible structural shifts in the economy. This type of analysis could also include problems related to the revision of time series data and the fact that different variables are measured at different frequencies. For example, when new data arrives regarding aggregate production it is of interest to know if the realised forecast error is i) an indication of a permanent structural change, or ii) due to measurement error that could possibly be corrected at a future revision of the data, or iii) the result of unexplained noise in the data with no implications for the economy. A Bayesian analysis would quantify the probability that a given forecast error is due to one or more of these explanations. The analysis is conducted in real time and it is therefore of importance for the decision makers understanding of where the economy finds itself at a given point in time. The analysis is expected to yield more accurate forecasts and above all more reliable uncertainty intervals for these forecasts.

### Recent publications

Carlsson, Mikael, "Investment and uncertainty: a theory-based empirical approach", *Oxford Bulletin of Economics and Statistics*, forthcoming.

Carlsson, Mikael and Jon Smedsaas, "Technology shocks and the labor-input response: evidence from firm-level data, *Journal of Money, Credit and Banking*, forthcoming.

Giordani, Paolo and Robert Kohn, "Efficient Bayesian inference for multiple change-point and mixture innovation models", *Journal of Business and Economic Statistics*, forthcoming.

Jacobson, Tor, Rolf Larsson, Johan Lyhagen and Marianne Nessén, "Inflation, exchange rates and PPP in a multivariate panel cointegration model", *Econometrics Journal*, forthcoming.

Jonsson, Magnus, "The Welfare Cost of Imperfect Competition and Distortionary Taxation" *Review of Economic Dynamics*, forthcoming.

### New working papers

The working papers are downloadable from our external web page [www.riksbank.se](http://www.riksbank.se) under Published/Publications. If you want to publish a working paper please contact Mikael Carlsson, Ph. 7870433. Note that to be considered for publication a paper should first have been presented at a research seminar.

**No. 199. Monetary Policy and Staggered Wage Bargaining when Prices are Sticky, by Mikael Carlsson and Andreas Westermark.**

**No. 200. The Swedish External Position and the Krona, by Philip R. Lane.**

**No. 201. Price Setting Transactions and the Role of Denominating Currency in FX Markets, by Richard Friberg and Fredrik Wilander**

**No. 202. The Geography of Asset Holdings: Evidence from Sweden, by Nicolas Coeurdacier and Philippe Martin**



## Workshops in 2006

### *Conference on The Governance of Central Banks*

On 31 August and 1 September, the Riksbank hosted a research conference on “The Governance of Central Banks” that gathered representatives from more than 15 central banks and leading academics from Europe and North America.

An important objective of the meeting was to explore common features and differences between central bank governance and corporate governance. Discussions during the conference focused much upon issues like general principles for the good governance of central banks, efficiency, and the importance of economic research.

In a keynote lecture on Regulation, Monetary policy and Independence, Alberto Alesina (Harvard), discussed normative and positive dimension in the delegation of task by politicians to non-political public authorities. Among other things he concluded that risky tasks with little redistributive potential are likely to be delegated by politicians. Charles Goodhart (LSE) addressed the importance of the home-host country debate for burden sharing in a potential European banking crisis. He argued that the current improvised financing arrangements will lead to an undersupply of bank recapitalizations from a social perspective. Jerry Caprio (Williams College) spoke about the design and governance of bank supervision. He expressed a fear that the increased discretion that bank supervisors will acquire under Basel is likely to attract political interference and invite corruption in countries with weak institutions. Renée Adams (University of Queensland) discussed “Who benefits from Federal Reserve Bank board memberships”. Her work indicates that commercial banks whose managers are appointed as a board member at a regional Fed experience above normal stock returns. She asserts that this may indicate that the governance structure of Feds may not be compatible with the goals of the Federal Reserve System. Other speakers were, among others, Franklin Allen, Arnoud Boot, Loretta Mester, Marco Pagano, Enrico Perotti, Torsten Persson.

The conference was concluded with a panel debate featuring Axel Weber (Bundesbank), Stefan Ingves (Riksbank), Thomas Hoenig (Kansas City Fed), Francesco Giavazzi (Bocconi), Mathias Dewatripont (ECARES) and Claudio Borio (BIS).

The full program and copies of the research presented are available at [www.riksbank.com/workshop/cbgovernance](http://www.riksbank.com/workshop/cbgovernance)

### *Workshop on Bayesian Econometric Methodology, September 8-9.*

Central banks are now routinely using Bayesian methods to estimate quite complicated economic models. Although economists use Bayesian methods extensively, such methods are rarely discussed in their own right within an economic context. The research division therefore decided to organize a workshop devoted entirely to Bayesian econometric methodology.

The workshop brought together a group of 35 researchers in Bayesian methodology from Europe, North America, and Australia. A majority of them are top researchers in the field. Two aspects separated this workshop from other workshops in the central banking community: i) the rather strict focus on the methodological aspects of Bayesian econometrics; applied work qualified only if it used already established methodology in a novel way, and ii) the participants were not only economists or econometricians, but also statisticians and engineers. The unusual mix of people was much appreciated by the workshop participants.

The opening talk of the workshop was given by the energetic 80-year old founder of Bayesian econometrics, Professor Arnold Zellner from University of Chicago, who talked about the past, present and future of Bayesian econometrics. Arnold emphasized, among other things, how Alan Greenspan was influenced by Bayesian thinking during his career. The opening talk was then followed by five 30-minute presentations, by John Geweke, Chris Sims, Rodney Strachan, Robert Kohn, and Luc Bauwens. Each paper was discussed by an invited discussant, and followed up by a floor discussion. The first day

ended with an excellent dinner at Grand Hotel. The second day featured presentations from Herman van Dijk, Dan Waggoner, Siddhartha Chib, Jesús Fernández-Villaverde, Michael Pitt, and Gary Koop.

More information can be found on the workshop's website [www.riksbank.com/workshop/BayesWorkshop](http://www.riksbank.com/workshop/BayesWorkshop), where also the presented papers and the authors' presentations can be downloaded.

### ***Historical Monetary Statistics for Sweden, October 20***

In 2006 the project entitled "Historical Monetary Statistics for Sweden, 1668-2008" has been running and a first workshop was held at the Riksbank in October. The purpose of this project is to collect and publish historical data on monetary variables in collaboration with a rather large group of researchers in Economic history affiliated with many of the Swedish universities.

A much appreciated first item on the agenda was a presentation of a similar project undertaken at Norges Bank. Øyvind Eitrheim, Jan Klovland and Ola Grytten shared their views and experiences from the Norwegian project during the past three years. The presentations of the on-going Swedish projects included: Johan Söderberg and Lars Franzen on prices, wages, and exchange rates; Rodney Edvinsson on real estate price indices; Svante Larsson on wages; Lars Jonung on money supply; Håkan Lobell and Jan Bohlin on exchange rates; Per Hortlund on the banking sector; Klas Fregert and Roger Gustafsson on government borrowing; and Daniel Waldenström on stock indices and interest rates. The workshop ended with a presentation of Gunnar Wetterberg's book project on the history of Sveriges Riksbank.

### ***Workshop on Exchange Rate Determination, November 10***

In early 2005 the Riksbank initiated co-operation with a number of external researchers as a complement to the bank's internal analysis and research. The topic for the project is determination of the Swedish Krona exchange rate. Five papers were presented and discussed at the workshop.

In his paper "*The Swedish External Position and the Krona*" Philip Lane explores the dynamics of the Swedish external position by investigating trends in Swedish gross and net international investment positions and their components. The focus is on factors that may explain changes in net foreign asset position, i.e., capital flows, as well as valuation effects.

Nicolas Coeurdacier and Philippe Martin investigate the effects of the Euro on cross-border financial holdings by analyzing the determinants of bond and equity holdings, as well as banking assets, and by attempting to disentangle the role of the Euro for countries both inside and outside the Euro-zone, with Sweden being a specific case. Their paper is entitled: "*The geography of asset holdings: Evidence from Sweden*".

The aim in Dagfinn Rime and Anna Lindahl's paper "*Forecasting the Foreign Exchange Market using Private Information*" is to improve on the current understanding by use of high quality data of end-user order flow from five Nordic banks for explaining recent Krona exchange rate movements.

Ethan Kaplan and Galina Hale presented "*Imperfect Common Knowledge and Learning in the Swedish Kronor Market*", an attempt to explain exchange rate movements in terms of heterogeneous information and learning behavior in exchange rate dynamics. The authors base their analysis on a range of factors that may affect exchange rates, i.e., prior prices, large versus small movements and measures of order flow.

Richard Friberg and Fredrik Wilander's study "*Price setting transactions and the role of denominating currency in FX Markets*" investigates to what extent Swedish firms denominate prices in foreign currency, primarily the Euro, and how this may affect the exchange rate. The paper examines price setting and invoicing behavior of a large sample of Swedish exporting firms.

The five papers were discussed by Torbjörn Becker, Karolina Ekholm, Michael Moore, Marco Lyrio, and Michael Devereux, in the order presented above. The papers can be downloaded from the website [www.riksbank.com/workshop](http://www.riksbank.com/workshop).