Research News 2013

Research division at Sveriges Riksbank

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This newsletter describes the research activities and output of the research division at Sveriges Riksbank in 2013.

Staff at the research division, 2013

Gustav Alfelt, research assistant

Christoph Bertsch, research economist

Roberto Billi, research economist

Paola Boel, research economist

Mikael Carlsson, visiting scholar

Ferre De Graeve, research economist

Tore Ellingsen, visiting scholar

Daria Finocchiaro, research economist

Paolo Giordani, visiting scholar

Isaiah Hull, research economist

Tor Jacobson, head of research and research economist

Thomas Jansson, research economist

Per Krusell, visiting scholar

Mats Levander, Ph.D. student at Stockholm School of Economics

Lena Löfgren, secretary

Conny Olovsson, research economist

Matias Quiroz, Ph.D. student at Stockholm University

Kasper Roszbach, research economist and deputy head of the monetary policy department

Dmytro Sheludchenko, research assistant

Per Sidén, research assistant

Peter van Santen, research economist

Leo Voltaire, research assistant

Erik von Schedvin, research economist

Mattias Villani, visiting scholar

Karl Walentin, research economist

Andreas Westermark, research economist

Xin Zhang, research economist

Reflections by the head of research

This year the research division has hired four new economists. The enlargement implies a substantial broadening of competence and scope for the research division. Paola Boel's research focuses on search and matching models of monetary exchange, which she is using now to investigate the redistributive effects of inflation. Conny Olovsson is interested in macroeconomics broadly defined, and his research includes asset prices, public finance and economic growth. Christoph Bertsch is an applied theorist specializing in financial economics and banking theory. Finally, Isaiah Hull is a computational economist, currently working on applications in macro-housing, monetary economics, and finance.

Kasper Roszbach has left the research division to become head of financial stability at the Riksbank. Kasper joined the division 11 years ago and his contributions have been equally plentiful and important in building this research environment, actually impossible to summarize in a short paragraph. We will miss a great colleague, but look forward to fruitful collaboration in the coming years!

In May this year, James Bullard, President and CEO of the Federal Reserve Bank of Saint Louis, visited the Riksbank and gave an appreciated presentation of his research paper entitled "Debt Overhang and Monetary Policy." Recently, James Bullard has shared his very interesting thoughts on the intersection between research and policy making in a piece entitled "The Importance of Connecting the Research World with the Policy World" published in The Regional Economist, www.stlouisfed.org, as well as in a longer interview with EconomicDynamics, www.economicdynamics.org. Anyone remotely interested in this question should look up the above references. In what follows, I will try to convey my own impressions on the challenges and responsibilities involved as we, the Riksbank (or any central bank), organize and conduct research work with the ultimate target of providing tax payers with better policy and economic outcomes. First of all I think it is essential to realize that central banks do not pursue research work solely for their own benefits, but in order to contribute in general to our understanding of how the economy functions. Therefore, the merits of research work conducted in any given place cannot be judged only by its influence on policy formation in that particular organization. But that begs the question why we should at all conduct research in central banks instead of simply allocating further resources to the academic world. I think the answer is quite obvious, yet at the same time complicated. Central banks provide ample opportunities for in-house researchers to learn about the precise aspects of the first-order policy challenges as they emerge, perhaps first only in the form of vague gut feelings experienced by clear-sighted policymakers. Central bank researchers will also have gained the experience over time to correctly identify which challenges to follow up on and dedicate long-term projects toward. What would be the responsibilities on the research side in exploiting the comparative advantage of conducting its work within a policy institution? The simple answer is to manage the trade-off between spending time on research and spending time on supporting policy. But there is nothing simple about this trade-off. On the one hand researchers will want to conduct sufficiently deep and thorough research to justify the results to be considered by the outside world, i.e., to warrant influential publications. On the other hand, it is imperative for research to support the policy side by making the fruits of research not only available, but also put to productive work in the policy process. As I see it, the real conflict here has to do with time constraints. There is no conflict between research quality, and the effectiveness of corresponding policy support. On the contrary, they enforce each other. Meanwhile, we can only ask for patience, well knowing that patience is a scarcity as time goes by.

In closing this year, I hope I am right in sensing that the research division at the Riksbank has made some progress towards both targets—good research and effective policy support.

      Tor Jacobson

Changes in the research staff

Several changes occurred within the research staff throughout the year. Most recently, **Kasper Roszbach** left his job as research economist in October to become the new head of the Riksbank's financial stability department. Four new research economists were also hired in 2013: **Christoph Bertsch**, **Paola Boel**, **Isaiah Hull** and **Conny Olovsson**. Christoph obtained his PhD from the European University Institute and he was a research associate (postdoc) at the University College London. He works primarily on applied micro theory with interests in financial intermediation, financial markets, industrial organization, international finance and macroeconomics. He is currently working on competition and risk taking in banking, as well as on financial contagion. Paola was an assistant professor at Bowdoin College and also a visiting faculty in the Economics Department at the University of Pennsylvania. Her primary research interests are in monetary theory, with a focus on search and matching models of monetary exchange. Isaiah recently completed a PhD in economics at Boston College, and he specializes in computational economics with applications in macroeconomics and finance. His most recent work explores the impact of monetary policy and macroprudential policy in a quantitative equilibrium model with housing and mortgage default. Conny was a visiting researcher at the Institute for International Economic Studies in Stockholm (2008-2013) and also a postdoc at the Stockholm School of Economics (2004-2008). Conny's research interests include public finance, asset pricing, economic growth and climate economics.

Dmytro Sheludchenko and **Per Sidén** both left their positions as research assistants in November to start new jobs as analysts at Swedbank and If Insurance Company respectively. The research division therefore hired two new research assistants: **Leo Voltaire** and **Vicke Norén**. Leo received his BSc in physics from Stockholm University and an MSc in Mathematical Finance from the University of York. He joined the research division in December and he will be working primarily with programming in SAS, Matlab and Stata. Vicke will join the research division next February, after completing a trainee program at the European Central Bank.

Summary of featured article

The following is a summary of the article by Ferre De Graeve and Alexei Karas titled "Evaluating Theories of Bank Runs with Heterogeneity Restrictions," which is forthcoming in the Journal of the European Economic Association.

The recent crisis is a forceful reminder that bank runs are a constant threat to financial systems. While runs can take place in different markets, the prevalence of bank runs in costly banking crises makes understanding their determinants of critical importance. This is all the more true since the two main theories on the cause of runs imply substantially different policy responses. While panic runs (as in e.g. Diamond and Dybvig, 1983) can be forestalled by deposit insurance, suspension of convertibility or liquidity provision, fundamental runs (as in e.g. Allen and Gale, 1998) involve policy measures such as balance sheet constraints, or even laissez-faire.

Traditional empirical tests of theories of bank runs (and financial crises more generally) are, by and large, variations on the following approach. First, define periods which constitute a crisis. Subsequently, verify if aggregate fundamental factors correlate with these dates, or whether fundamental variables explain cross-sectional differences across banks during crisis times. The reduced form nature of these tests along with some of the assumptions involved in crisis-period identification pose significant challenges to definitive structural inference on the importance of different theories of bank runs.

In this paper, the authors propose a twist to standard macroeconometric methods (structural vector autoregressions, SVAR) by incorporating cross-sectional information into identification. It enables the use of novel, heterogeneity restrictions to single out bank runs from other concurrent events. This approach has important advantages relative to earlier evidence on banks runs. Firstly, it eliminates the need to subjectively label particular periods as a crisis, as well as the need to assume that everything occurring in those periods is exogenous and due to the bank run. Secondly, the approach goes beyond establishing reduced form correlations by providing structural impulse responses. The results provided are conditional on a bank run, while alternative, concurrent sources of variation in the data are explicitly controlled for. These features address inconvenient properties of traditional tests of bank runs which have rendered structural interpretations difficult.

The authors identify bank runs as deposit-market supply shocks in which insurance matters. They are characterized by an outflow of uninsured deposits relative to insured deposits, and are not driven by a (relative) decrease in uninsured deposit interest rates. Conditional on bank runs, the authors quantify the contribution of both the fundamental and the panic view by investigating cross-sectional differences across uninsured banks with good and bad fundamentals. They also evaluate the effect of being insured in the

face of a run. The approach is applied to Russian deposit market data for the period 2002-2007. Russian micro bank data are not only of high quality and detail, but they are also very informative about the topic at hand. Indeed, the paper's sample includes at least one severe market disruption, dozens of bank failures, cross-sectional heterogeneity in deposit insurance, and more.

The paper's results bear on the policy debate. In particular, they show that there is merit in both the fundamental and the panic view. On the one hand, fundamentally flawed banks face substantially larger deposit outflows during a bank run, relative to banks with strong fundamentals. This corroborates the fundamental view. On the other hand, even banks with solid fundamentals face significant outflows. This finding provides support for the panic view, especially since such outflows are not observed at banks that have deposit insurance. Importantly, particularly from a policy perspective, we quantify the relevance of both theories in the aggregate. In the paper's sample, panic effects substantially outweigh fundamental effects.

With very few exceptions, empirical studies have attributed bank runs to the fundamental view and thus downweigh the role of panics. However, due to its reduced form nature, finding fundamentals to be important is subject to different possible interpretations. The authors' results, which are structural, attribute a much larger role to the panic view of bank runs. This has important policy implications. In particular, fundamentals-based regulation may prove insufficient to curb transmission of banking crises through deposit markets. Rather, policies geared towards effectively shielding depository institutions from panic effects may be required to do so effectively.

Research projects pursued in 2013

CREDIT AND BANKING

Trade Credit and the Propagation of Corporate Failure: an Empirical Analysis
Tor Jacobson and Erik von Schedvin

Using an exhaustive data set on claims held by trade creditors (suppliers) on failed trade debtors (customers), we quantify the importance of trade credit chains for the propagation of corporate bankruptcy. We show that trade creditors experience significant trade credit losses due to trade debtor failures and that the creditors' bankruptcy risks increase in the size of incurred losses. By exploring the role of financial constraints and creditor-debtor dependence, we conclude that the propagation mechanism is driven by both credit losses and demand shrinkage. Furthermore, propagation is mitigated for less-leveraged, cash rich, and profitable creditors. It is instead enhanced during economic downturns.

(continuing from previous year)

On the Non-Exclusivity of Loan Contracts: An Empirical Investigation
Hans Degryse, Vasso Ioannidou and Erik von Schedvin

A string of theoretical papers shows that the non-exclusivity of credit contracts generates important negative contractual externalities. Employing a unique dataset, we identify how these externalities affect the supply of credit. Using internal information on a creditor's willingness to lend, we find that a creditor reduces its credit supply when a borrower obtains a loan at another creditor (an "outside loan"). Consistent with the theoretical literature, the effect is more pronounced the larger the outside loans. It is instead muted if the initial creditor's existing and future loans retain seniority over the outside loans and are secured with valuable collateral.

(continuing from previous year)

Trade Credit Networks and Corporate Cash Holdings
Tor Jacobson, Robert Townsend and Erik von Schedvin

We evaluate whether the degree of inter-firm connectedness through trade credit usage impact on corporate cash holdings. Our empirical analysis documents three interesting findings. First, corporate cash holdings exhibit a negative relationship with accounts payable. Second, by exploring a temporary change in the Swedish bankruptcy law, we establish a causal effect from accounts payable on cash holdings. Last, we find that the effect of accounts payable on cash holdings is mitigated if the suppliers of the firms are more liquidity constrained. These results are in line with the presumption that informal trade credit networks work as a risk sharing device.

(continuing from previous year)

What Do 53 Million Trade Credit Contracts Say About Inter-Firm Liquidity Provision?

Tore Ellingsen, Tor Jacobson and Erik von Schedvin

What determines the conditions in trade credit contracts and their ex post realizations? In this paper, we make use of a large data set containing contract-level information on trade credit issued by 51 Swedish corporate trade creditors (suppliers) over the period 2004–2012. Using the identities of the trade creditors as well as their corporate debtors (customers), we can condition our empirical analysis on creditor and debtor characteristics, and even on creditor-debtor (match) specific characteristics.

The Effect of Cash Flow on Investment: An Empirical Test of the Balance Sheet Channel

Ola Melander and Erik von Schedvin

This paper tests the balance sheet theory, where the status of balance sheets affects the economy's response to monetary and other shocks. The theory predicts a positive effect of cash flow on investment, given fundamental determinants of investment. We use an empirical method developed by Gilchrist and Himmelberg (1995, 1999), which has previously only been used to study very large, publicly traded firms. This paper extends the analysis by using a large Swedish data set with many smaller firms, where balance-sheet effects are likely to be especially important. We find that a firm's cash flow has a positive impact on its investment, controlling for any information in cash flow about investment opportunities. As predicted by the balance-sheet channel, the estimated effect of cash flow on investment is especially large for firms which, a priori, are more likely to be financially constrained (low-dividend, small and non-group firms). Moreover, the investment-cash flow sensitivity is significantly larger and more persistent during the first half of the sample period, which includes a severe banking crisis and recession, than during the second half.

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A Micro-Based Macro-Prudential Indicator: Future Firm-Failure Frequencies

Tor Jacobson, Ingvar Strid and Erik von Schedvin

The purpose of this project is to explore stress testing of the Swedish corporate sector with respect to firm failure risks as a tool for enhanced macroprudential policy analysis. It can be shown that the aggregate firm failure frequency in Sweden is highly correlated with the Swedish bank's credit losses over time (for the period 1990-2009). Hence, by means of reasonably accurate forecasts of future failure frequencies one could hope to make inference about future credit losses. Moreover, if such forecasts are model based, then the model can serve as a basis for stress testing the corporate sector's vulnerability in various scenarios. We propose to estimate a logistic model of firm failure similar to Jacobson, Lindé, and Roszbach (2011) and evaluate the model's forecasting properties for horizons up to 3 years. Firm-failure frequency forecasts will be calculated by conditioning on the macroeconomic scenarios generated by the Riksbank DSGE model "Ramses".

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The Role of Export Guarantees for Foreign Trade: an Event Study

Laurent Bach, Tor Jacobson and Erik von Schedvin

Sweden is a small open economy, its export share of GDP exceeds 50 percent, and the world trade collapse towards the end of 2008 and in 2009 had an immediate and very large impact on Swedish export volumes. But which were the mechanisms at play? It is certainly true that the world-wide great recession induced a huge decline in foreign demand for Swedish goods and services, clearly manifested in export volumes at the aggregated level. It is equally true that there was considerable variation in export outcomes across industries and firms, and demand shocks alone cannot explain this variation. In this paper we will use firm-level data to explore two channels caused by financial frictions that can help explain the cross-sectional variation—over and above shortfalls in demand—in Swedish exports during the global trade collapse in 2009.

(continuing from previous year)

Credit Ratings and Bank Monitoring Ability

Leonard Nakamura and Kasper Roszbach

In this paper, we use credit-rating data from two large Swedish banks to elicit evidence on banks' loan monitoring ability. For these banks, our tests reveal that banks' credit ratings indeed include valuable private information from monitoring, as theory suggests. However, our tests also reveal that publicly

available information from a credit bureau is not efficiently impounded in the bank ratings: The credit bureau ratings not only predict future movements in the bank ratings but also improve forecasts of bankruptcy and loan default. We investigate possible explanations for these findings. Our results are consistent with bank loan officers placing too much weight on their private information, a form of overconfidence. To the extent that overconfidence results in placing too much weight on private information, risk analyses of the bank loan portfolios in our data could be improved by combining the bank credit ratings and public credit bureau ratings. The methods we use represent a new basket of straightforward techniques that enable both financial institutions and regulators to assess the performance of credit rating systems.

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Collateralization, Bank Loan Rates and Monitoring: Evidence from a Natural Experiment
Geraldo Cerqueiro, Steven Ongena and Kasper Roszbach

We study how a large Swedish bank reacts to a legal reform that abolishes the special priority rights of collateral held by lenders. Upon reform the bank lowers its estimates of the asset value of the pledged collateral, raises the loan spreads, and reduces the affected borrowers' credit limits. The lowering in collateral value also leads the bank to slow its review process of both borrowers and collateral. Our findings therefore suggest that the pledging of collateral is valuable to borrowers by incentivizing the bank to monitor. In sum, collateral does not turn a bank into a "lazy" monitor.

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Evaluating Theories of Bank Runs with Heterogeneity Restrictions
Ferre De Graeve and Alexei Karas

This paper empirically tests theories of bank runs. We use a structural panel VAR to extract runs from deposit market data. Identification exploits cross-sectional heterogeneity in deposit insurance: we identify bank runs as adverse deposit market supply shocks hitting uninsured banks harder compared to insured. Conditional on a run, we study the behavior of uninsured banks with bad and good fundamentals. We find that both experience runs, but deposit outflows at the former are more severe. Panic effects, which affect all uninsured deposits alike, irrespective of fundamentals, dominate in the aggregate. Insured banks partially absorb the outflow of uninsured deposits.

(accepted for publication)

The Importance of Reallocation for Productivity Growth: Evidence from European and U.S. Banking
Jaap Bos, Paul Schilp and Peter van Santen

This paper quantifies the effect of reallocation dynamics on aggregate productivity developments in the banking sectors of Europe and the United States. We document an increase in productivity over the period 1995-2009, on the order of 11% in the US and 19% in Europe. At an annual frequency, under-performing banks capture market share, while more productive banks lose market share, in particular in the US. The pattern of reallocation is markedly different between the geographical regions: European productivity has grown by reallocating inputs through the first half of the sample, at the same time when reallocation diminished growth in the US. Within-firm growth has been rising steadily in both areas, largely due to technical change. The long-run positive effects of creative destruction are especially apparent in the US, where reallocation is an important driver of increases in aggregate productivity.

(continuing from previous year)

HOUSEHOLD SAVING

Household Indebtedness
Thomas Jansson, Tor Jacobson, and Paolo Sodini

Empirical research on households' financial decisions has been hampered due to lack of high-quality household micro data. In this project we have access to a new unique micro dataset, which includes detailed information not only on a large sample of Swedish households' financial and real assets but also on their liabilities. In the dataset, the exact composition of households' asset portfolios and the conditions of their debt (amounts, interest rates, variable or fixed rates, collateral etc.) are reported. We also have detailed income data, which enables us to estimate labor income volatility (separated into transitory and permanent components) at the individual level. Hence, our dataset enables us to estimate a household's total exposure

to various risk factors. In the first subproject we study mortgage debt defaults. Our preliminary empirical results indicate that households with high loan-to-value and loan-to-income ratios, high labor income risk, and low holdings of financial assets tend to default on their mortgage debt to a higher degree. The purpose of the other subproject is to use our micro data to calibrate a lifecycle model. Our focus will be on households' borrowing levels and on the rate at which households decide to amortize the mortgage, depending on the evolution of house prices, income and interest rates.

How Parents Influence the Wealth Accumulation of their Children
Peter Englund, Thomas Jansson, and Todd Sinai

We decompose the channels through which parents and children have correlated net worth using a novel administrative data set from Sweden that follows a panel of parents matched to their grown children. We find that children's initial endowments of net worth and their subsequent net worth accumulations are positively correlated with parents' net worth. There are two main channels of intergenerational wealth correlation. Children of wealthy parents have higher earnings, even conditional on intergenerational correlation in earnings, most of which they consume. The intergenerational correlation in net worth comes largely from housing wealth. We argue that arises from correlated home ownership among high net worth parents and their children, the propensity of home owners to save, and from children of high net worth parents spending more on housing at the time of first purchase. We also consider the impact of bequests, intervivos transfers, portfolio choice, and savings propensities.

Incompatible Partners? Cultural Predispositions and Household Financial Behavior
Michael Haliassos, Thomas Jansson, and Yigitcan Karabulut

Recent research has shown that stock market participation rates differ widely across countries. In principle, these differences can be attributed to the economic environment (relevant institutions and markets etc.) and to cultural factors. Attribution of the observed cross-country differences to these two factors is important, not only for understanding the role of each in shaping financial behavior but also for understanding the scope for reducing undesirable differences across countries by harmonization of institutions. Still, the role of culture on household financial behavior is largely unmapped due to lack of high quality micro data. In this paper, we address this problem by considering data of unmatched precision and quality on individuals living in Sweden. As we can observe a wide range of individual characteristics, including country of birth and individual holdings of financial and real assets, our plan is to compare the financial behavior of immigrants with the financial behavior of individuals born in Sweden with similar characteristics. As all face the same institutions, observed differences will be more directly attributable to culture, and we can study magnitudes, directions, and persistence through time.

Uncertain Pension Income and Household Saving
Peter van Santen

I study the relationship between household saving and pensions, and I estimate both the displacement effect of pensions on private saving and the precautionary saving effect due to uncertainty in pension income. Using a lifecycle framework, current consumption is derived as a function of expected pension benefits, pension risk and mortality risk. I estimate the saving rate equation implied by the model using panel data for Dutch households. Pension benefits and survival expectations are elicited probabilistically. Regression results show that more affluent households displace saving with expected pension income, and that households save more due to pension income uncertainty and to lifetime uncertainty, as predicted by the theory. These results are robust to the inclusion of correlated random household effects.

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Pension Wealth and Household Savings in Europe: Evidence from SHARELIFE
Rob Alessie, Viola Angelini and Peter van Santen

We use recently collected retrospective survey data to estimate the displacement effect of pension wealth on household savings. The third wave of the Survey of Health, Ageing and Retirement in Europe, SHARELIFE, collects information on the entire job history of the respondent, a feature missing in most previous studies. We show that addressing measurement error problems is crucial to estimate the displacement effect when using survey data. We find that each euro of pension wealth is associated with a 47 (61) cent decline in non-pension wealth using robust (median) regression. In the presence of biases from measurement errors and omitted (unobserved) variables, we estimate a lower bound to the true offset

between 17% and 30%, significantly different from zero. Instrumental variables regression estimates, although less precise, suggest full displacement.

(accepted for publication)

HOUSING

Business-Cycle Implications and Mortgage Spreads
Karl Walentin

What are the business cycle effects of shocks to the interest rate spread between residential mortgages and government bonds of corresponding maturity? We start by noting that the mortgage spread (i) has substantial volatility, (ii) is countercyclical and (iii) leads GDP by 2-3 quarters. Using a structural VAR, we find that innovations to the mortgage spread reduce house prices, residential investment, consumption and GDP by both economically and statistically significant magnitudes. Furthermore, the policy interest rate reacts strongly and in an offsetting direction to mortgage spread innovations. These findings highlight the relevance of financial frictions in residential mortgage markets as an unexplored source of business cycles. In addition, we show that unconventional monetary policy which affects the mortgage spread has sizable macroeconomic impact. Our results are robust to the inclusion of a corporate spread.

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Debt, Equity and Monetary Policy
Daria Finocchiaro and Caterina Mendocino

This paper studies the optimal conduct of monetary policy in an economy subject to changes in the financing conditions of firms. The model features credit and equity financing as well as nominal price rigidities. Firms face two types of financial frictions: a collateral constraint and rigidities in their capital structure. In the face of adverse shocks, entrepreneurs who are limited in their capital holding by the existence of an occasionally binding collateral constraint may partly raise external funds via a reduction in their equity payout. However, since adjusting their capital structure is costly, firms cut both employment and investment. Two sources of macroeconomic fluctuations are introduced into the model: a productivity shock, and a shock originating in the credit market. Welfare analyses show that, in addition to inflation, an interest-rate response to credit is optimal. Credit shocks account for most of the gains from a policy response to credit.

(continuing from previous year)

Interest Rate Rules and Mortgage Default
Isaiah Hull

This paper examines how a central bank's choice of interest rate rule impacts the rate of mortgage default and welfare. I do this by constructing a quantitative equilibrium (QE) model that incorporates incomplete markets, aggregate uncertainty, overlapping generations, and realistic mortgage structure. Through a series of counterfactual simulations, I demonstrate five things: 1) nominal interest rate rules that exhibit cyclical behavior increase the average default rate and lower average welfare; 2) welfare can be substantially improved by adopting a modified Taylor Rule that stabilizes house prices; 3) a decrease in the length of the interest rate cycle will tend to increase the average default rate; 4) if the business and housing cycles are not aligned, then aggressive inflation targeting will tend to increase the mortgage default rate; and 5) regulatory interventions that limit the set loan contracts available to certain households may stabilize the housing cycle and improve welfare. In addition to these findings, my model also reproduces an important mechanism for default, which had not existed previously in the QE literature: default spikes happen when income falls and home equity is degraded at the same time. Overall, my results suggest that the univariate time series properties of interest rates (i.e. wavelength, persistence, and variance) may play a substantial role in generating mass mortgage default events. If a central bank wishes to avoid such crises, they should either adopt a rule that generates interest rates with long wavelengths or use a modified Taylor Rule that also targets house price growth.

LABOR MARKET

Involuntary Unemployment and the Business Cycle
Lawrence Christiano, Mathias Trabandt and Karl Walentin

Can a model with limited labor market insurance explain standard macro- and labor market data jointly? We seek to construct a monetary model in which: i) the unemployed are worse off than the employed, i.e. unemployment is involuntary and ii) the labor force participation rate varies with the business cycle. To illustrate key features of our model, we start with the simplest possible New Keynesian framework with no capital. We then integrate the model into a medium-sized DSGE model and show that the resulting model does as well as existing models at accounting for the response of standard macroeconomic variables to monetary policy shocks and two technology shocks. In addition, the model does well at accounting for the response of the labor force and unemployment rate to these three shocks.

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Labor Market Frictions and Optimal Steady-State Inflation
Mikael Carlsson and Andreas Westermark

In central theories of monetary non-neutrality, the Ramsey optimal steady-state inflation rate varies between the negative of the real interest rate and zero. This paper explores how the interaction of nominal wage and search and matching frictions affect the policy prescription. We show that adding the combination of such frictions to the canonical monetary model can generate an optimal inflation rate that is significantly positive. Specifically, for a standard U.S. calibration, we find a Ramsey optimal inflation rate of 1.15 percent per year.

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Labor Market Frictions, the Long-Run Phillips curve and Optimal Monetary Policy
Mikael Carlsson and Andreas Westermark

The paper analyzes the long- and short-run Phillips curves in a model akin to the one developed in "Labor Market Frictions and Optimal Steady-State Inflation." Specifically, we find a negative long-run relationship between inflation and unemployment. Moreover, we also analyze equilibrium dynamics under optimal monetary policy.

The Optimal Inflation Target under Downward Nominal Wage Rigidity
Mikael Carlsson and Andreas Westermark

We study the implications for optimal average inflation when there is both a role for money as a medium of exchange and when nominal wages are downwardly rigid. The model also features transaction costs, as in Dotsey, King & Wolman (1999), and a non-Walrasian labor market with search frictions as in Trigari (2009). The introduction of downward nominal wage rigidities into a model with flexible wages can be decomposed into two effects; first, introducing (symmetric) wage adjustment frictions and, second making them asymmetric. Productivity growth is important for the level of inflation and also affects the size of the effect of the asymmetric wage friction. Without productivity growth, symmetric wage adjustment frictions leads to a yearly inflation rate of approximately 1.0%, while introducing an asymmetry on top of this increases the inflation rate by an additional 0.7%. With productivity growth, inflation is almost a percent lower and the effect of adding asymmetric wage frictions is also somewhat smaller - about 0.5%. Overall, we find an optimal inflation rate of about 0-2 percent.

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The Replacement Rate, Unemployment and Wage Setting
Vesna Corbo and Andreas Westermark

In this paper, we evaluate the effects of changes in the replacement rate of unemployment benefits on wages and unemployment in a general equilibrium setting. Specifically, we estimate a DSGE model using Bayesian techniques including data for unemployment benefits and find that a change in the replacement rate has a much larger effect on the unemployment rate than on wages. Allowing for permanent shocks to the replacement rate, we find a semielasticity of unemployment of approximately 1.22. Our rich model of the wage bargain further allows us to determine the relative importance of match separation and strike/lockout in wage bargaining. In our main specification, the probability of a strike occurring is

approximately 0.3, indicating that breakdowns are more important threat points than conflicts in negotiations when wages are determined..

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Spillover Effects from Labor Mobility

Mikael Carlsson, Lena Hensvik, Oskar Nordstrom-Skans and Peter van Santen

We analyze labor flows among Swedish manufacturing firms, using a matched employer-employee data set covering Sweden between 1990 and 2002. We find that workers moving from more-productive firms to less-productive firms are associated with productivity gains for the receiving firms. In contrast, hiring from less-productive firms is neutral to productivity. The gains are especially large for engineers. The results are robust to a number of control variables, including firm fixed effects. The next step will consist in applying this method to the dataset covering the universe of firms and workers between 1990 and 2011.

MONETARY POLICY

Nominal GDP Targeting and the Zero Lower Bound: Should We Abandon Inflation Targeting?

Roberto Billi

I compare nominal GDP level targeting to flexible inflation targeting in a small New Keynesian model subject to the zero lower bound on nominal policy rates. I first test the two targets under central bank discretion and find that, for a plausible calibration, inflation targeting leaves the economy vulnerable to a deflationary trap, while nominal GDP targeting provides a firm nominal anchor. Next, I test the targets under simple policy rules with forward guidance. In this case, an inflation target outperforms a nominal GDP target, because it allows the central bank to give guidance directly on interest rates, rather than indirectly on a level of GDP it seeks to achieve.

Output Gaps and Robust Monetary Policy Rules

Roberto Billi

Policymakers often use the output gap, a noisy signal of economic activity, as a guide for setting monetary policy. Noise in the data argues for policy caution. At the same time, the zero bound on nominal interest rates constrains the central bank's ability to stimulate the economy during downturns. In such an environment, greater policy stimulus may be needed to stabilize the economy. Thus, noisy data and the zero bound present policymakers with a dilemma in deciding the appropriate stance for monetary policy. I investigate this dilemma in a small New Keynesian model, and show that policymakers should pay more attention to output gaps than suggested by previous research.

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PRICE SETTING

Refining Stylized Facts from Factor Models of Inflation

Ferre de Graeve and Karl Walentin

Factor models of disaggregate inflation indices suggest that sectoral shocks generate the bulk of sectoral inflation variance, but no persistence. Aggregate shocks, by contrast, are the root of sectoral inflation persistence, but have negligible relative variance. We show that simple factor models do not cope well with essential features of price data. In particular, sectoral inflation series are subject to features such as measurement error, sales and item substitutions. In factor models, these blow up the variance of sector-specific shocks, while reducing their persistence. We control for such effects by estimating a refined factor model and find that inflation variance is driven by both aggregate and sectoral shocks. Sectoral shocks, too, generate substantial inflation persistence. Both findings contrast with earlier evidence from factor models, but align well with recent micro evidence. Our results have implications for the foundations of price stickiness, and provide quantitative inputs for calibrating models with sectoral heterogeneity.

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FISCAL-MONETARY INTERACTION

Distortionary Fiscal Policy and Monetary Policy Goals
Klaus Adam and Roberto Billi

We reconsider the role of an inflation conservative central banker in a setting with distortionary taxation. To do so, we assume monetary and fiscal policy are decided by independent authorities that do not abide to past commitments. If the two authorities make policy decisions simultaneously, inflation conservatism causes fiscal overspending. But if fiscal policy is determined before monetary policy, inflation conservatism imposes fiscal discipline. These results clarify that in our setting the value of inflation conservatism depends crucially on the timing of policy decisions.

(continuing from previous year)

Fiscal Multipliers under Downward Nominal Wage Rigidity
Mikael Carlsson and Andreas Westermark

The purpose of this paper is to analyze whether fiscal multipliers are asymmetric in the presence of downward nominal wage rigidities. Specifically, spending shocks might have smaller effects on wages in recessions than in booms, implying that multipliers vary across the cycle.

Identifying Fiscal Inflation
Ferre De Graeve and Virginia Queijo von Heideken

Fiscal theorists warn about the risk of future inflation as a consequence of current fiscal imbalances in the US. Because actual inflation remains historically low and data on inflation expectations do not corroborate such risks, warnings for fiscal inflation are often ignored in policy and academic circles. This paper shows that a canonical NK-DSGE model enables identifying an anticipated component of inflation expectations that is closely related to fiscal policy. Estimation results suggest that fiscal inflation concerns have induced a 1.6%-points increase in long-run inflation since 2001. The model also rationalizes why data on inflation expectations do not reveal such concerns outright.

BARGAINING

Long-Term Relationship Bargaining
Andreas Westermark

We analyze a bargaining model where there is a long-term relationship between a seller and a buyer and there is bargaining over a sequence of surpluses that arrives at fixed points in time. Markov Perfect Equilibria are analyzed and equilibrium payoffs characterized. The transfers between the players can be described as a first-order system of difference equations. Payoffs depend on both current and future surpluses. Future surpluses are important partly because the risk of separation leads to the loss of surplus today and in the future and partly because delay without separation can last into future periods. We also find conditions for existence and uniqueness of equilibria with immediate agreement.

(continuing from previous year)

ECONOMETRICS

Modeling Dynamic Volatilities and Correlations under Skewness and Fat Tails
Drew Creal, Siem Jan Koopman, André Lucas and Xin Zhang

We propose a new model for dynamic volatilities and correlations of skewed and heavy-tailed data. Our model endows a non-normal distribution with time-varying parameters driven by the information from the observation density function. The key novelty in our approach is the fact that the skewed and fat-tailed shape of the distribution directly affects the dynamic behavior of the time-varying parameters. We present simulated and empirical evidence that shows that the model outperforms its close competitors.

(continuing from previous year)

Un-truncating VARs
Ferre De Graeve and Andreas Westermark

Macroeconomic research often relies on structural vector autoregressions to uncover empirical regularities. Critics argue the method goes awry due to lag truncation: short lag-lengths imply a poor approximation to DSGE-models. Empirically, short lag-length is deemed necessary as increased parameterization induces excessive uncertainty. The paper shows that this argument is incomplete. Longer lag-length simultaneously reduces misspecification, which in turn reduces variance. For data generated by frontier DSGE-models long-lag VARs are feasible, reduce bias and variance, and have better coverage. Thus, contrary to conventional wisdom, the trivial solution to the critique actually works.

(continuing from previous year)

Static and Dynamic Binary Response Models with Misclassified Dependent Variables Applied to Annuity Ownership
Rob Alessie, Adriaan Kalwij and Peter van Santen

We study the problem of misclassification of the dependent variable in a binary choice setting. The literature has paid attention to the static (cross-sectional data) case, and finds that misclassification yields biased estimates of the parameters of interest. Much less is known about the dynamic (panel data) case. We derive the likelihood of the observed outcomes in a dynamic panel probit model, and discuss two approaches to parameter estimation. First, as proposed by Keane and Sauer (2009, Econometrica), one may resolve to simulating the entire process generating the data, and use simulated maximum likelihood to estimate the parameters. Second, we can formulate the problem as a hidden Markov model. This setup allows us to use a recursive algorithm to compute the likelihood function without simulations. The expectation-maximization (EM) method can then be invoked for parameter estimation. We apply both static and dynamic models to ownership of annuity policies for a panel of Dutch households. The survey data is likely to be error-ridden, as we document transition probabilities in ownership at the household level which seem too large. Moreover, for a subset of households, we know the duration of the policies, and therefore can construct an ownership variable which should be closer to the true value. We use this measure to benchmark our results. Our estimates of the misclassification probabilities suggest that part of the "annuity puzzle" can be explained by underreporting ownership of annuities.

(continuing from previous year)

Conditional Euro Area Sovereign Default Risk
André Lucas , Bernd Schwaab and Xin Zhang

We propose an empirical framework to assess the likelihood of joint and conditional sovereign default from observed CDS prices. Our model is based on a dynamic skewed t distribution that captures all salient features of the data, including skewed and heavy-tailed changes in the price of CDS protection against sovereign default, as well as dynamic volatilities and correlations that ensure that uncertainty and risk dependence can increase in times of stress. We apply the framework to euro area sovereign CDS spreads during the euro area debt crisis. Our results reveal significant time variation in distress dependence and spill-over effects for sovereign default risk. We investigate market perceptions of joint and conditional sovereign risk around announcements of Eurosystem asset purchases programs, and document a strong impact on joint risk.

(accepted for publication)

Modeling Financial Sector Tail Risk with Application to the Euro Area
André Lucas , Bernd Schwaab and Xin Zhang

We develop a novel high-dimensional non-Gaussian framework to infer joint and conditional measures of financial sector risk. For this setting we also derive a conditional law of large numbers which permits the computation of joint and conditional risk measures within seconds. Joint risk assessments are based on a dynamic multivariate skewed-t copula which accommodates asymmetries, heavy tails, as well as non-linear and time-varying dependence in asset values. We apply the modeling framework to assess the risk from multiple financial firm defaults in the euro area during the financial and sovereign debt crisis, and find unprecedented joint tail risks during 2011-12. Augmenting the model with additional explanatory variables helps to explain the systematic correlation dynamics.

(continuing from previous year)

Dynamic Mixtures-of-Experts Models for Longitudinal and Discrete-Time Survival Data
Matias Quiroz and Mattias Villani

We propose a general class of flexible models for longitudinal data with special emphasis on discrete-time survival data. The model is a finite mixture model where the subjects are allowed to move between components through time. The time-varying probability of component memberships is modeled as a function of subject-specific time-varying covariates. This allows for interesting within-subject dynamics and manageable computations even with a large number of subjects. Each parameter in the component densities and in the mixing function is connected to its own set of covariates through a link function. The models are estimated using a Bayesian approach via a highly efficient Markov Chain Monte Carlo (MCMC) algorithm with tailored proposals and variable selection in all set of covariates. The focus of the paper is on models for discrete-time survival data with an application to bankruptcy prediction for Swedish firms, using both exponential and Weibull mixture components. The dynamic mixture-of-experts models are shown to have an interesting interpretation and to dramatically improve the out-of-sample predictive density forecasts compared to models with time-invariant mixture probabilities.

FINANCIAL THEORY

Financial Frictions, Investment and Tobin's q
Dan Cao, Guido Lorenzoni and Karl Walentin

We develop a model of investment with financial constraints and use it to investigate the relation between investment and Tobin's q. A firm is financed partly by insiders, who control its assets, and partly by outside investors. When their wealth is scarce, insiders earn a rate of return higher than the market rate of return, i.e., they receive a quasi-rent on invested capital. This rent is priced into the value of the firm, so Tobin's q is driven by two forces: changes in the value of invested capital, and changes in the value of the insiders' future rents per unit of capital. This weakens the correlation between q and investment, relative to the frictionless benchmark. We present a calibrated version of the model, which, due to this effect, generates a realistic joint behavior of investment, q, and cash flow. In particular, the model roughly replicates the values of the coefficients in empirical investment regressions.
(continuing from previous year)

A Detrimental Feedback Loop: Deleveraging and Adverse Selection
Christoph Bertsch

Market distress can be the catalyst of a deleveraging wave, as in the 2007/08 financial crisis. This paper demonstrates how market distress and deleveraging can fuel each other in the presence of adverse selection problems in asset markets. At the core of the detrimental feedback loop is agents' desire to reduce their reliance on distressed asset markets by decreasing their leverage, which in turn amplifies the adverse selection problem in asset markets. In the extreme case, this leads to a market breakdown. I find that adverse selection creates both an "ex-ante" inefficiency because it distorts agents' long-term leverage choices, as well as an "interim" inefficiency because it distorts agents' short-term liquidity management. I derive important implications for central bank policy.

A Wake-Up Call: Information Contagion and Strategic Uncertainty
Toni Ahnert and Christoph Bertsch

A successful speculative attack against one currency is a wake-up call for speculators elsewhere. Currency speculators have an incentive to acquire costly information about exposures across countries to infer whether their monetary authority's ability to defend its currency is weakened. Information acquisition per se increases the likelihood of speculative currency attacks via heightened strategic uncertainty among speculators. Contagion occurs even if speculators learn that there is no exposure. Our new contagion mechanism offers a compelling explanation for the 1997 Asian currency crisis and the 1998 Russian crisis, both of which spread across countries with seemingly unrelated fundamentals and limited interconnectedness. The proposed contagion mechanism applies generally in global coordination games and can also be applied to bank runs, sovereign debt crises, and political regime change.

Generalized Disappointment Aversion and Systemic Downside Risk
Roméo Tédongap and Xin Zhang

We define and measure the financial systemic risk consistently based on an economic model. The main innovation from the methodological approach is to price financial assets in a general equilibrium framework based on time-varying measurements of risk, i.e. changing macroeconomic forecasts and uncertainty, as well as investor preferences, which are asymmetric and consistent with axiomatic decision theory. Using this framework, we are able to explain non-linear risk-return relationships in a wide range of asset classes and to decompose asset premia into individual components, from which we can identify and measure the contribution of systemic risk. In particular, we will be able to assess the impact of financial regulation by analyzing how the systemic-risk component of asset prices has evolved through time and across different asset classes.

MACROECONOMICS

How Does a Pay-As-You-Go System Affect Asset Returns and the Equity Premium?
Conny Olovsson

When applying a differences-in-differences approach, equity returns and the equity premium are both estimated to be more than four percentage points higher after the introduction of a pay-as-you-go (PAYGO) system. In a realistically calibrated model, the PAYGO system is also found to increase the returns and the premium, although the effects are smaller than in the data. Intuitively, the system lowers asset prices, which in turn increases the importance of dividend risk. Since only equity is subject to dividend risk, equity returns become more volatile relative to bond returns.

(accepted for publication)

Optimal Taxation with Home Production
Conny Olovsson

Optimal taxes for Europe and the U.S. are derived in a realistically calibrated model where agents buy consumption goods and services, and use home capital and labor to produce household services. The optimal tax rate on services is substantially lower than the tax rate on goods. Specifically, the planner cannot tax home production directly and instead lowers the tax rate on market services to increase the relative price of home production. The optimal tax rate on home capital is closely linked to the tax rate on consumption goods, and the welfare gains from switching to optimal taxes are large.

Energy-Saving Technical Change
John Hassler, Per Krusell and Conny Olovsson

We estimate an aggregate production function with constant elasticity of substitution between energy and a capital/labor composite using U.S. data. The implied measure of energy-saving technical change appears to respond strongly to the oil-price shocks in the 1970s and has a negative medium-run correlation with capital/labor-saving technical change. Our findings are suggestive of a model of directed technical change, with low short-run substitutability between energy and capital/labor but significant substitutability over longer periods through technical change. We construct such a model, calibrate it based on historical data, and use it to discuss possibilities for the future.

COMPUTATIONAL ECONOMICS

Predicting the Spread of Financial Innovations: an Epidemiological Approach
Isaiah Hull

I construct an estimable statistic that predicts whether a financial innovation will spread. The approach embeds the multi-host SIR model from epidemiology within a financial model of correlated securities trade; and takes advantage of the related predictive tools from mathematical epidemiology, including the basic reproductive ratio (R0) and herd immunity. In the model, banks and their creditors are assumed to have imperfect information about a newly-created security, and must search over the portfolios of other investors and intermediaries to infer the security's properties. In the absence of historical returns data, a large mass of firms holding the new security and not experiencing insolvency provides a positive signal about the distribution of its returns within the current period, and perpetuates further holding of the security. The model yields a set of structural equations that are used to construct the statistic. I provide two estimation

strategies for the statistic; and identify 12 theoretical parameter restrictions that enable inference when only a subset of the model's parameters is identifiable. I use the approach to predict the spread of exchange traded funds (ETFs) and asset-backed securities (ABS). Additionally, I show how regulators can use the method to monitor the joint solvency of depository institutions within a given geographic region.

Approximate Dynamic Programming with Post-Decision States as a Solution Method for Dynamic Economic Models
Isaiah Hull

I introduce and evaluate a new stochastic simulation method for dynamic economic models. It is based on recent work in the operations research and engineering literatures (Van Roy et. al, 1997; Powell, 2007; Bertsekas, 2011). The baseline method involves rewriting the household's dynamic program in terms of post-decision states. This makes it possible to choose controls optimally without computing an expectation. I add a subroutine to the original algorithm that updates the values of states not visited frequently on the simulation path; and adopt a stochastic stepsize that efficiently weights information. Finally, I modify the algorithm to exploit GPU computing.

MONETARY THEORY

On the Redistributive Effects of Inflation: an International Perspective
Paola Boel

I use a microfounded model of money to quantify the redistributive effects of expected inflation in a sample of OECD countries. In doing so, I address two quantitative issues. First, I pin down money demand rigorously, which implies accounting for the possibility of policy breaks. I show that this has significant implications for both the quality of the fit as well as the measurements' values. Second, I construct comparable estimates of wealth distribution across countries by using harmonized microdata from the Luxembourg Wealth Study. Two main results emerge from the analysis. First, in all countries considered inflation acts as a regressive tax. Second, the magnitude of such redistributive effects differs across countries and it depends not only on wealth distribution, but also on the curvature and the level of money demand for any given interest rate.

Redistributive Effects of Inflation in a Model of Money and Capital
Paola Boel and Julián P. Díaz

We introduce heterogeneity in trade risk in a microfounded model of money with capital, thus inducing a distribution in both cash and capital holdings. We then calibrate the model for a subsample of OECD countries. In doing so, we address the following questions: What are the redistributive effects of inflation? How does the nature of the asset held affect the direction of the redistribution? Does inflation act as a progressive tax when a productive asset is held? Do results hold across OECD countries? We find that several results hold for all countries considered. First, inflation acts as a tax on two fronts, in that it reduces both real cash balances and capital accumulation. Second, inflation is a progressive tax which hurts rich, high-consumption agents more than it does poor, low-consumption ones. Third, the magnitude of the redistributive effects differs across countries and it depends on the distributions of capital and liquid asset holdings.

Publications accepted in 2013

Adam, Klaus and Roberto Billi, "Distortionary Fiscal Policy and Monetary Policy Goals," forthcoming in *Economics Letters*.

Alessie, Rob, Viola Angelini and Peter van Santen, "Pension Wealth and Household Savings in Europe: Evidence from SHARELIFE," published in the *European Economic Review*, 2013, Vol. 63, pp. 308-328.

De Graeve, Ferre and Alexei Karas, "Evaluating Theories of Bank Runs with Heterogeneity Restrictions," forthcoming in the *Journal of the European Economic Association.*

Giordani, Paolo, Tor Jacobson, Erik von Schedvin and Mattias Villani, "Taking the Twists into Account: Predicting Firm Bankruptcy Risk with Splines of Financial Ratios", forthcoming in the *Journal of Financial and Quantitative Analysis*.

Giordani, Paolo, Robert Kohn and Minh Ngoc Tran, "Copula-Type Estimators for Flexible Multivariate Density Modeling Using Mixtures," forthcoming in *Journal of Computational and Graphical Statistics*.

Li, Feng, and Mattias Villani, "Efficient Bayesian Multivariate Surface Regression," forthcoming in *Scandinavian Journal of Statistics*.

Lucas, André , Bernd Schwaab and Xin Zhang, "Conditional Euro Area Sovereign Default Risk," forthcoming in *Journal of Business and Economic Statistics*.

Walentin, Karl, "Housing Collateral and the Monetary Transmission Mechanism," forthcoming in the *Scandinavian Journal of Economics*.

Walentin, Karl, Discussion of "Capital Injection, Monetary Policy, and Financial Accelerators" by Hirakata, Sudo and Ueda, *International Journal of Central Banking*, 2013, Vol. 9(2), pp. 147-154.

Working papers

No. 282, Toni Ahnert and Christoph Bertsch, "A Wake-Up Call: Information Contagion and Strategic Uncertainty"

No. 281, Karolina Holmberg, "Lines of Credit and Investment: Firm-Level Evidence of Real Effects of the Financial Crisis"

No. 280, Karolina Holmberg, "Firm-Level Evidence of Shifts in the Supply of Credit"

No. 279, Isaiah Hull, "Predicting the Spread of Financial Innovations: an Epidemiological Approach"

No. 278, Klaus Adam and Roberto M. Billi, "Distortionary Fiscal Policy and Monetary Policy Goals"

No. 277, Christoph Bertsch, "A Detrimental Feedback Loop: Deleveraging and Adverse Selection"

No. 276, Isaiah Hull, "Approximate Dynamic Programming with Postdecision States as a Solution Method for Dynamic Economic Models"

No. 275, Karl Walentin, "Business Cycle Implications of Mortgage Spreads"

No. 274, Paola Boel, "On the Redistributive Effects of Inflation: an International Perspective"

No. 273, Ferre De Graeve and Virginia Queijo von Heideken, "Identifying Fiscal Inflation"

No. 272, Thomas Jansson, "Housing Choices and Labor Income Risk"

No. 271, Ferre De Graeve and Andreas Westermark, "Un-truncating VARs"

No. 270, Roberto M. Billi, "Nominal GDP Targeting and the Zero Lower Bound: Should We Abandon Inflation Targeting?"

No. 269, André Lucas, Bernd Schwaab and Xin Zhang, "Conditional Euro Area Sovereign Default Risk"

No. 268, Matias Quiroz and Mattias Villani, "Dynamic Mixture-of-Experts Models for Longitudinal and Discrete-Time Survival Data"

No. 267, Stefan Pitschner, "Using Financial Markets to Estimate the Macro Effects of Monetary Policy: an Impact-Identified FAVAR"

No. 266, Andreas Wastermark, "Long-Term Relationship Bargaining"

No. 265, Rob Alessie, Viola Angelini and Peter van Santen, "Pension Wealth and Household Savings in Europe: Evidence from SHARELIFE"

Other research activities

Conferences

The research division organized a conference on "Bubbles." The conference brought together researchers representing the two main theoretical perspectives - rational bubbles and bubbles caused by distorted beliefs - as well as researchers in macroeconomics and finance who address these issues empirically. Leading experts in the field discussed macroeconomic implications, monetary and macro-prudential policy options, managerial incentives, empirical preconditions for and common features of bubbles, and more.

Greater Stockholm Macro Group

Together with Per Krusell (IIES, Stockholm University), we continue to organize a monthly internal seminar series for macro researchers from all major institutions in Stockholm and Uppsala. The series is known as "Greater Stockholm Macro Group" and it aims at fostering exchange of ideas and cooperation among macro researchers in the Stockholm area.

Research seminars

The research division organizes weekly research seminars, mainly by invited international visitors. The seminars normally take place on Tuesdays at 1 pm and attendance is open to Riksbank employees as well as to all academics. A complete list of upcoming and historical seminars is available on the homepage of the Riksbank's Research Division.

Internship program

As customary, the research division hosted four PhD interns in 2013. This year's interns were Asgerdur Petursdottir (University of New South Wales), Li Zhao, (Pompeu Fabra), Yildaz Akkaya (Bilkent University) and Sergio de Ferra (London School of Economics).

Sabbaticals

Andreas Westermark visited the Federal Reserve Bank of Chicago during March to June 2013. Most of his visit was spent working on downward nominal wage rigidities and the optimal inflation rate. He also worked on the projects "The Replacement Rate, Unemployment and Wage Setting," coauthored with Vesna Corbo, and "Long-Term Relationship Bargaining."

Teaching and Advising

Daria Finocchiaro taught part of a first-year graduate macro course at Uppsala University in the fall. Her lectures dealt with classical consumption theory, asset prices and overlapping generation models, while also touching upon fiscal policy issues.

Ferre De Graeve and Kasper Roszbach taught half of an MSc course on "Financial Stability and Regulation" at Stockholm School of Economics in the fall. The course gave MSc students in finance and economics an overview of the drivers behind the financial crisis, the regulatory responses that followed and the role and workings of central banks and banking supervision.

Karl Walentin and Andreas Wastermark both advised economics Ph.D. students from Uppsala University, while Paola Boel advised an economics MSc student, also from Uppsala University. Xin Zhang advised a financial mathematics MSc student from the Royal Institute of Technologies.

Miscellanea

Karl Walentin co-organized the New York University economics PhD alumni conference. Kasper Roszbach was the program chair for the IBEFA/WEAI Conference and he was part of the program committees for the Financial Intermediation Research Society Conference and the ESCB Day Ahead Conference.

Upcoming events in 2014

The bank will organize and host two courses in the spring. Both will be open to Riksbank's employees as well as economics Ph.D. students from the Stockholm area. The first is a new course, and it will be taught by Professor Randall Wright from the University of Wisconsin-Madison. Professor Wright is a renowned scholar with important contributions in the fields of monetary, macro and labor economics. His pioneering work on search and matching models of monetary exchange is of particular relevance in the field of monetary economics. The course will cover the following topics in monetary theory: early microfounded models of money; search-and bargaining models; the mechanism-design approach; quantitative papers using

numerical methods; models that can be used for quantitative work and papers on the quantitative effects of inflation.

The second course will be taught by faculty from Stockholm and Uppsala University, as well as by Professor Lars E.O. Svensson from SIFR. It will be a second-year Ph.D. course on monetary economics aimed at introducing students to modern New Keynesian models for monetary policy and business-cycle analysis. These models are dynamic stochastic general equilibrium models based on optimizing behavior and rational expectations. At the same time, they incorporate price and wage rigidity, permitting an important role for aggregate demand shocks and monetary policy to affect activity. They have become a standard tool for central banks and they are used as a framework for much modern research in macroeconomics. The course will cover the basic New Keynesian model, optimal policy, labor market frictions, open economies, and also introduce methods for solution and simulation. Throughout, the microeconomic foundations of these models will be emphasized.

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