

Contents

Editorial

Macroeconomics of the yield curve: expectations and systematic monetary policy in the spotlight

Dynamic rating targeting and banks' excess capital buffers

Russian monetary and exchange rate policy

Recent Bank of Finland research publications

Forthcoming publications

Conferences and workshops

Bank of Finland research in peer-reviewed journals

Editor

Jouko Vilmunen

Publisher

Bank of Finland

ISSN 1457-5809

(print)

ISSN 1457-5817

(online)

PO Box 160,

FI-00101 Helsinki

Email: research@bof.fi

www.bof.fi and

www.bof.fi/bofi

Editorial

The transmission mechanism of monetary policy can in principle be described in relatively simple terms. When the central bank raises its steering rate, other interest rates in the economy also rise, reducing the growth rate of aggregate activity by slowing down the growth of interest-sensitive components of aggregate demand. This stylized view of the transmission mechanism does not, however, reveal much about the complex relationship that exists between interest rates and monetary policy as actually observed in financial markets. In practice, the relationship between changes in the central bank's steering rate and, in particular, long-term market interest rates appears to be looser and more variable than suggested by the stylized view. We can often observe movements in market interest rates in the context of economic data releases or public statements by policymakers even when there are no accompanying changes in the monetary policy steering rate. The stylized view also provides very little insight into the source of

the central bank's leverage over market interest rates. In fact, central banks usually control very short-term interest rates, so the interesting question is how this particular feature of the monetary policy regime allows the central bank to influence the structure of short- and long-term interest rates in the economy. In order to gain deeper understanding of the relationship between the steering rate and market interest rates, we should perhaps start from the view that expectations of investors and other economic agents concerning the future path of the monetary policy steering rate is critical for the dynamic behaviour of market interest rates. Consequently, to understand the transmission mechanism of monetary policy and the dynamics of market interest rates, knowledge of how agents form expectations and construct this expected policy path, and what factors cause the path to change, is of utmost importance.

Jouko Vilmunen

Macroeconomics of the yield curve: expectations and systematic monetary policy in the spotlight

It is often argued that effective control of short-term interest rates is the mark of successful monetary policy. There is a great deal of truth in this statement, but we could also argue that more than effective short-term interest rate control, successful monetary policy should be defined in terms of its ability to shape market expectations of the way in

which interest rates, inflation and output are likely to evolve in the near future. What, then, is the channel through which central banks are able to affect, by using the very short-term steering rate, market expectations concerning the future path of policy? According to the widely used and analytically simple expectations hypothesis of the term structure of interest rates, the interest rate on any security can be viewed as an average of today's steering rate and the entire sequence of future steering rates expected by financial markets

over the life of the security coupled with a term premium, which is time invariant, but possibly depends on the maturity of the security. The expectations hypothesis is perhaps best known from its main implication, according to which future spot interest rates can be well forecast by forward interest rates, so that the term premiums are practically speaking zero. In any case, the expectations hypothesis maintains that investors' expectations about the future path of the steering rate are of primary importance to the behaviour of current market rates. Consequently, even if the central bank does not communicate the path of the future steering rates to the market, investors have to postulate, or, alternatively, forecast a path for the policy rate in order for the markets to be able to determine market interest rates. However, the important issue here is that according to the expectations hypothesis, market interest rates are conditional on market expectations concerning future monetary policy.

Because it puts a lot of emphasis on the formation of agents' expectations, the expectations hypothesis seems to provide a plausible starting point for the analysis of the transmission mechanism of monetary policy. The principal challenges the theory faces are, consequently, more empirical in nature: ie its empirical foundations are more often than not relatively weak. Observations on the term structure of interest rates – the yield curve – from different countries do not provide indisputable evidence in support of the theory's key idea that changes in agents' expectations are the principal source of movements in the yield curve. How do economists explain this failure of the expectations hypothesis? Can the failure be given an explanation based on macroeconomic fundamentals? In other words, can the rejection of the expectations hypothesis be explained by modern dynamic macroeconomic models? Federico Ravenna and Juha Seppälä approach this problem in their work 'Monetary policy and rejections of the expectations hypothesis', which has recently

been published in the Bank of Finland discussion paper series (BoF 25/2006). The authors construct a sticky price dynamic general equilibrium model, a New Keynesian general equilibrium macro-model, to explain the determination and equilibrium properties of the yield curve. Due to short-term price stickiness, monetary policy, which follows an interest-rate rule, has real effects that affect output at business cycle frequencies through fluctuations in aggregate demand. Monetary policy reacts systematically to changes in the state of the economy, so that the operational characteristics of the policy regime will impinge upon the dynamic relationship between those factors that fundamentally affect the movements of the yield curve. Ravenna and Seppälä demonstrate in their study that the key implications of their model are consistent with the empirical evidence on the nominal yields of US government bonds in the post World War II period. The model is also able to account for the procyclical movements of average bond yields as well as for the countercyclical movements in the term spread, ie the difference between the long- and short-term yields. In addition to the solution algorithm used by the authors, one of the most interesting novelties of their dynamic general equilibrium approach is that they are able to derive time-varying risk premiums endogenously. They are, as a consequence, able to give a full account of the sources of the failure of the expectations hypothesis in the context of an intertemporal optimization problem.

The results that the authors derive are very interesting. First of all, in contrast to existing studies, Ravenna and Seppälä show that monetary policy shocks – unexpected changes in the steering rate – and inflation risk premiums do not explain the failure of the expectations hypothesis. Quite surprisingly, the systematic component of monetary policy, in this context interest rate smoothing by the central bank, is sufficient to account for the failure. The underlying logic goes as

follows. In order to reject the expectations hypothesis, we need a time-varying term or risk premium. In the authors' model, this is the outcome from assuming habit formation in household preferences. The time variation of the term premium is primarily affected by the volatility of interest rates (reflecting uncertainty about future spot market interest rates) and the time-varying serial correlation of the stochastic discount factor. The stochastic discount factor, or pricing kernel, is used to price contingent claims and is closely related to the willingness of investors to shift wealth over time. In any case, due to sticky prices, systematic monetary policy can influence the dynamic behaviour of the key macroeconomic variables in the model, most notably the volatility of short-term interest rates, as well as the hedging value of government bonds, through which it can also affect the dynamic properties of term premiums. Despite its good performance on these dimensions, the New Keynesian model constructed by Ravenna and Seppälä is not able to explain the constant term structure of interest rate volatility in the United States or the decreasing correlation between output and nominal bond yields as the maturity of the bond increases. For these reasons alone, we would recommend active pursuit of research into dynamic general equilibrium modelling of asset prices to generate 'acid tests' for these models.

Dynamic rating targeting and banks' excess capital buffers

On the basis of recent research, it could be argued that the conventional analysis of optimal capital structure has largely ignored the potential benefits associated with a sufficiently high credit rating for banks or other enterprises. The price of debt may well be one of these benefits. Leverage is one of the factors affecting firms' credit ratings, which may explain why firms try to achieve a specific credit rating by managing their equity debt ratio. Empirical evidence from US

financial and non-financial corporations suggests that companies react asymmetrically to rating changes by reducing leverage in response to rating downgrades and doing nothing after rating upgrades. Consequently, recent studies suggest that maintaining a certain minimum rating is the primary objective of rating targeting.

Rating targeting may be particularly important for financial institutions like banks. In addition to the cost of debt capital, a bank's access to unsecured markets appears to be tied to maintaining a sufficiently high rating. Empirical evidence also suggests that banks take particular measures to restore their capital base to the level required by a sufficiently high credit rating. The amount of capital thus required is called economic capital in the banking industry and in the associated research. Estimates from eg data on large US banks suggest, however, that these banks are more likely to survive unexpected credit losses or unexpected reductions in asset values than banks with top ratings. Researchers have offered two alternative explanations to account for the observed patterns: either the economic capital model used in the calculations biases the results, or the calculations do not take into account all the risk factors that the rating agencies incorporate in their estimates.

Esa Jokivuolle and Samu Peura offer in their recently published Bank of Finland discussion paper (BoF 27/2006) an alternative approach based on dynamic rating targeting to explain why banks hold capital buffers in excess of the minimum amount of economic capital required by the minimum rating target. Their study sets out from the idea that, in addition to the current top rating target, the size of a bank's capital buffer may be affected by its future rating target. If true, this implies that the optimal level of a bank's economic capital (which is determined by considerations related not only to its current but also to its future rating target) is inherently a dynamic problem, not a static one as emphasized by conventional static models of

banks' economic capital. The authors illustrate their approach with a hypothetical bank holding only a corporate credit portfolio. They assume that the bank will seek with a given degree of certainty to maintain its credit rating at at least a specific target level throughout the planning horizon. During the planning horizon the bank can face unexpected credit losses or surprise reductions in asset values, or its timely access to external capital markets may not be possible, at least not without excessive costs.

Jokivuolle and Peura demonstrate that minimum rating targeting can be incorporated into the VaR (Value-at-Risk) models routinely used by banks. The approach is closely related to their earlier study of a bank reserving a capital buffer on top of its minimum regulatory capital requirement. In the current study of minimum rating targeting the minimum regulatory capital is replaced by the bank's economic capital. In fact, since economic capital itself is obtained from a VaR calculation, methodologically the approach involves solving two nested VaR problems. The authors calibrate their model's confidence level so as to indicate the level with which a highly rated bank would prefer to maintain at least a single A rating over its planning horizon. The calibration uses data on a representative US high quality bank's credit portfolio. The calibrated confidence level is then compared with evidence on banks' rating transition probabilities. This evidence provides a direct indication of how often an AA-rated bank would tolerate a rating downgrade below single A. The outcome of their calibration exercise is interesting, indicating that the implied estimation results are consistent with the evidence on changes in banks' credit ratings. In particular, the results give support to the authors' initial hypothesis that rating targeting explains banks' capital buffers in excess of their economic capital. The study by Jokivuolle and Peura effectively complements previous research conducted at the Bank of Finland. It also provides further

evidence that a systematic and sustained as well as carefully focused research effort will bear fruit and provides a foundation for the development of analytical tools to facilitate decision making at the central bank.

Russian monetary and exchange rate policy

In recent years, Russian monetary and exchange rate policy has pursued two objectives: the central bank has aimed at curbing inflation – currently running at 9% – and at constraining appreciation of the real exchange rate. In order to meet the latter objective, the Russian central bank has sought to dampen the strengthening of the nominal exchange rate. Attainment of the central bank's objectives has been hampered by Russia's robust economic growth and rapidly expanding export earnings. High energy prices – notably the price of oil – have elevated the value of Russian exports. The Russian current account surplus for the first three quarters of last year stood at USD 78 billion, ie about 11% of GDP, while the country also saw considerable inflows of foreign investment. The foreign trade surplus and foreign investment increased Russian foreign exchange reserves by some USD 120 billion in 2006, bringing them to about USD 300 billion at the end of the year. On top of its foreign exchange reserves, the Russian state is also accumulating a Stabilisation Fund from oil revenues. At the end of the year, the value of the Fund totalled about 10% of GDP.

The Institute of Economics in Transition is currently working on a number of research projects focusing on analysis of Russian monetary and exchange rate policy. In their study 'Diagnosing Dutch Disease: Does Russia Have the Symptoms?' (BOFIT Discussion Paper 6/2007), Katerina Kalcheva and Nienke Oomes examine whether Russia can be deemed to suffer from the 'Dutch disease'. This refers to a situation where the prices of raw materials – in this case the prices

of oil and other energy products – increase, leading to higher export earnings in the exporting country. This, in turn, triggers real currency appreciation, resulting in lower industrial output and exports. As indicated by Kalcheva and Oomes, Russia can be seen as showing a number of Dutch disease symptoms, such as the diminishing role of industrial output in the economy and rapidly rising wages. Even so, the exchange rate cannot yet be considered overvalued.

Tuuli Juurikkala and Iikka Korhonen also review the relationship between the oil price and the exchange rate in their study ‘Equilibrium exchange rates in oil-dependent countries’ (BOFIT Discussion Paper 8/2007). This report provides an analysis of the impact of the oil price on the real exchange rate in countries with large oil exports. A rise in the price of the main export product naturally affects the exchange rate, and the research findings suggest that a 10% oil price hike, for example, would lead to an appreciation of at least 5% in the real exchange rate.

In their study ‘Money demand in post-crisis Russia: De-dollarisation and re-monetisation’, Iikka Korhonen and Aaron Mehrotra analyse the demand for money in Russia. The researchers arrive at a stable relationship between money demand and its underlying factors. Following the 1998 economic crisis, the use of foreign currency in Russia – mainly the US dollar – has decreased; nevertheless, the exchange rate continues to have an impact on local demand for money. These findings point to the Russian central bank being able to influence inflation through

adjustments to the external value of the rouble. Likewise, the velocity of circulation of money has declined, which suggests increased credibility of economic policy.

Conferences and workshops

The Bank of Finland’s research unit will arrange, in cooperation with recognised research institutes, two international scientific conferences, for which the call for papers is currently open.

In June, a conference will be organised in collaboration with Professor Iftekhar Hasan (Lally School of Management and Technology, Rensselaer Polytechnic Institute) and, for the first time, the Journal of Financial Stability (JFS). The topic of this conference will be ‘Financial Instability, Supervision and Central Banks’. The call for papers will close on 28 February.

In September, a conference will be organised with SUERF (Société Universitaire Européenne de Recherches Financières) and the topic will be ‘Financial Markets, Innovation and Growth’. The call for papers is open until 15 May.

Further information may be obtained from: www.suerf.org and [www.bof.fi/research/Conferences and workshops](http://www.bof.fi/research/Conferences%20and%20workshops)

The next Research Newsletter will provide details of other upcoming conferences.

Recent Bank of Finland research publications

Bank of Finland Discussion Papers

Aaron Mehrotra: A note on the national contributions to euro area M3, BOF DP 2/2007.

Timo Korkeamäki – Yrjö Koskinen – Tuomas Takalo: Phoenix rising: Legal reforms and changes in valuations in Finland during the economic crisis, BOF DP 1/2007.

Tomi Dahlberg – Anssi Öörni: Finnish consumers' expectations on developments and changes in payment habits. Survey in connection with the research project 'Finnish payment habits 2010', BOF DP 32/2006.

Ian W Marsh: The effect of lenders' credit risk transfer activities on borrowing firms' equity returns, BOF DP 31/2006.

Ville Aalto-Setälä – Robert M Schindler: The importance of attractive prices in pricing dynamics, BOF DP 30/2006.

Katja Taipalus: A global house price bubble? Evaluation based on a new rent-price approach, BOF DP 29/2006.

Juha Kilponen – Helvi Kinnunen – Antti Ripatti: Population ageing in a small open economy – some policy experiments with a tractable general equilibrium model, BOF DP 28/2006.

Esa Jokivuolle – Samu Peura: Rating targeting and the confidence levels implicit in bank capital, BOF DP 27/2006.

Ville Mälkönen – Timo Vesala: The adverse selection problem in imperfectly competitive credit markets, BOF DP 26/2006.

Federico Ravenna – Juha Seppälä: Monetary policy and rejections of the expectations hypothesis, BOF DP 25/2006.

Bill B Francis – Iftekhar Hasan – Xian Sun: Financial market integration and the value of global diversification: evidence from US acquirers in cross-border mergers and acquisitions, BOF DP 24/2006.

Asokan Anandarajan – Iftekhar Hasan – Cornelia McCarthy: The use of loan loss provisions for capital management, earnings management and signalling by Australian banks, BOF DP 23/2006.

Terhi Jokipii: Forecasting market crashes: further international evidence, BOF DP 22/2006.

BOFIT Discussion Papers

Yuqing Xing: Foreign direct investment and China's bilateral intra-industry trade with Japan and the US, BOFIT DP 1/2007.

Jiao Wang – Andy G. Ji: Exchange rate sensitivity of China's bilateral trade flows, BOFIT DP 19/2006.

Arnaud Mehl: The yield curve as a predictor and emerging economies, BOFIT DP 18/2006.

Svetlana Ledyeva – Mikael Linden: Foreign direct investment and economic growth: Empirical evidence from Russian regions, BOFIT DP 17/2006.

Scientific monographs

Heli Snellman: Automated Teller Machine network market structure and cash usage, E:38, 2006.

Mika Arola: Foreign capital and Finland, E:37, 2006.

Laura Solanko: Essays on Russia's Economic Transition, E:36, 2006.

Forthcoming publications

Bank of Finland Discussion Papers

Benedikt Goderis – Ian W Marsh – Judit Vall Castello – Wolf Wagner: Bank behaviour with access to credit risk transfer markets.

BOFIT Discussion Papers

A. A. Peresetsky – A. M. Karminsky – S. V. Golovan: Russian banks private deposit interest rates and market discipline.

Barry Harrison – Yulia Vymyatnina: Currency Substitution in a de-Dollarizing Economy: The Case of Russia.

Jesus Crespo Guaresma – Tomas Slacik: An "Almost-too-late" warning mechanism for currency crises.

Andrei Vernikov: Russia's banking sector

transition: Where to?

Nienke Oomes – Katerina Kalcheva:

Diagnosing Dutch Disease: Does Russia Have the Symptoms?

Alicia Garcia Herrero – Tuuli Koivu: Can the

Chinese trade surplus be reduced with exchange rate policy?

Iikka Korhonen – Tuuli Juurikkala:

Equilibrium exchange rates in oil-dependent countries.

Bank of Finland research in peer-reviewed journals

2007

Timo Vesala: Switching costs and relationship profits in bank lending. *Journal of Banking and Finance*, Vol 31, Issue 2, Feb 2007: 477–493.

Tuomas Takalo (BoF) – Panu Poutvaara: Candidate Quality International Tax and Public Finance, 14; 1; 2007: 7–27.

Mikael Bask – Tung Liu – Anna Widerberg: The Stability of Electricity Prices: Estimation and Inference of the Lyapunov Exponents *Physica A*, 376, 2007: 565–572.

2006

Aaron Mehrotra (BOFIT) – Timo Vålilä: Public Investment in Europe: Evolution and Determinants in perspective. *Fiscal studies*, 27; 4, 2006: 443–471.

Albert Carreras – Concepción García-Iglesias – Juha Kilponen (BoF): Un Siglo y Media de Velocidad de Circulación del Dinero en España: Estimación y Determinantes *Revista de Historia Economica (Journal of Iberian and Latin American Economic History)*, N.º 2. Otoño 2006. Año XXIV.

Tuomas Takalo (BoF) – Klaus Kultti – Juuso Toikka: Cross-Licensing and Collusive Behaviour. *Homo Oeconomicus*, 23; 2; 2006: 181–194.

Markku Lanne: Nonlinear dynamics of interest rate and inflation. *Journal of Applied Econometrics*, Vol. 21, 2006: 1157–1168.

Aaron Mehrotra (BOFIT) – Timo Vålilä: Public Investment in Europe: Evolution and

Determinants in perspective. *Fiscal studies*, 27; 4; 2006: 443–471.

Iikka Korhonen (BOFIT) – Paul Wachtel: A note on exchange rate pass-through in CIS countries. *Research in International Business and Finance*, Vol. 20, No 2, 2006: 215–226.

Jarko Fidrmuc – Iikka Korhonen (BOFIT): A meta-analysis of business cycle correlation between the euro area and CEECs: What do we know – and who cares? *Journal of Comparative Economics*, Vol. 34, No. 3, 2006: 518–537.

Maritta Paloviita (BoF): Inflation dynamics in the euro area and the role of expectations. *Empirical Economics*, Vol. 31, No. 4 / November, 2006: 847–860.

Luis J. Álvarez – Emmanuel Dhyne – Marco Hoeberichts – Claudia Kwapil – Hervé Le Bihan – Patrick Lünemann – Fernando Martins – Roberto Sabbatini – Harald Stahl – Philip Vermeulen – Jouko Vilmunen (BoF): Sticky Prices in the Euro Area: A Summary of New Micro-Evidence. *Journal of the European Economic Association*, 4, 2–3, 2006: 575–584.

Yehning Chen – Iftekhar Hasan: The transparency of the banking system and the efficiency of information-based bank runs. *Journal of Financial Intermediation*, Volume 15, Issue 3, July: 307–331.

Heiko Schmiedel – Markku Malkamäki – Juha Tarkka (BoF): Economies of scale and technological development in securities depository and settlement systems. *Journal of Banking & Finance*, 30, 6, June 2006: 1783–1806.

- Marco Sorge – Kimmo Virolainen (BoF): A comparative analysis of macro stress-testing methodologies with application to Finland. *Journal of Financial Stability*, Vol. 2, Issue 2, June 2006: 113–151.
- Klaus Kultti – Tuomas Takalo (BoF) – Juuso Toikka: Simultaneous Model of Innovation, Secrecy, and Patent Policy. *American Economic Review*, Volume 96, Issue 2, May 2006: 82–86.
- Emmanuel Dhyne – Luis J. Álvarez – Hervé Le Bihan – Giovanni Veronese – Daniel Dias – Johannes Hoffman – Nicole Jonker – Patrick Lünemann – Fabio Rumler – Jouko Vilmunen (BoF): Price changes in the euro area and the United States: Some facts from individual consumer price data. *Journal of Economic Perspectives*, 20, 2, Spring 2006: 171–192.
- Martin Ellison – Liam Graham – Jouko Vilmunen (BoF): Strong contagion with weak spillovers. *Review of Economic Dynamics*, Volume 9, Issue 2, April 2006: 263–283.
- Luis H. R. Alvarez – Erkki Koskela: Irreversible Investment under Interest Rate Variability: Some Generalizations. *Journal of Business*, 79, 2, March 2006: 623–644.
- Jukka Jalava – Matti Pohjola – Antti Ripatti (BoF) – Jouko Vilmunen (BoF): Biased Technical Change and Capital-Labour Substitution in Finland, 1902–2003. *Topics in Macroeconomics*, Vol. 6, No. 1, Article 8.
- Forthcoming**
- Mikael Bask: Exchange Rate Volatility without the Contrivance of Fundamentals. *Frontiers in Finance and Economics*.
- Karlo Kauko (BoF): Interlinking Securities Settlements: a Strategic Commitment. *Journal of Banking and Finance*.
- Michael Funke: Inflation in mainland China – modelling a roller coaster ride. *Pacific Economic Review*.
- Paul Wachtel – Iikka Korhonen (BOFIT): Observations on disinflation in transition economies. *Monetary Policy in Low Inflation Economies*, David E. Altig – Ed Nosal (eds).
- Ari Hyytinen (BoF) – Olli-Pekka Ruuskanen: Time use of the self-employed. *Kyklos*, Vol. 60, No. 1, 2007: 87–103.
- Ari Hyytinen (BoF) – Mika Pajarinen: Is the cost of debt capital higher for younger firms? *Scottish Journal of Political Economy*, Vol. 54, No. 1, 2007: 55–71.
- Terhi Jokipii – Alistair Milne: Cyclical Behaviour of European Bank Capital Buffers. *Journal of Banking and Finance*, 30th Anniversary Issue.
- Kai Leitemo: The Optimal Perception of Inflation Persistence is Zero. *Scandinavian Journal of Economics*.
- Juha Kilponen (BoF) – Kai Leitemo: Model Uncertainty and Delegation: A Case for Friedman’s k-percent Money Growth Rule. *Journal of Money Credit and Banking*.
- Patrick Crowley: A guide to wavelet for economists. *Journal of Economic Surveys*.
- Maritta Paloviita (BoF): Comparing alternative Phillips curve specifications: European results with survey-based expectations. *Applied Economics*.
- Martin Ellison – Lucio Sarno – Jouko Vilmunen (BoF): Monetary policy and learning in an open economy. *Macroeconomic Dynamics*.
- Terhi Jokipii – Brian Lucey: Contagion and Interdependence: Measuring CEE Banking Sector Co-Movements. *Economic Systems*.
- Tuomas Takalo (BoF) – Klaus Kultti – Juuso Toikka: Secrecy vs. Patenting. *RAND Journal of Economics*, Supplementary Appendix.
- Tuomas Takalo (BoF) – Klaus Kultti – Tanja Tanayama: R&D Spillovers and Information Exchange: a Case Study. *Greek Economic Review*.
- David Mayes (BoF): Nordic and Antipodean Solutions to the Problem of Responsibility without Power. *Journal of Banking Regulation*.
- David Mayes (BoF): Financial Stability in a World of Cross-Border Banking. *European Business Organization Law Review*.
- Gerald P. Dwyer Jr – Iftekhar Hasan: Suspension of Payments, Bank Failures: Non-public Losses. *Journal of Monetary Economics*.