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Research Newsletter

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Wilko Bolt's Inaugural lecture: 'Payments and Policy'

DNB senior economist Wilko Bolt gave his inaugural lecture 'Payments and Policy' on 31 October 2018. Interview with the new Professor of Payment Systems at the School of Business and Economics (SBE), Vrije Universiteit Amsterdam (VU). "Payment economics lies at the intersection of monetary theory, banking and industrial organisation", said Bolt in his lecture.

Modern
The VU is a modern university, as it is the first to offer the Economics of Payment Systems course as part of the Master's degree in Finance and Financial Management. By offering this course, the SBE fills a niche that brings together different trends including modern technology, changing consumer behaviour and new regulations. "Everyone knows something about payment systems, but ››

DNB Annual Research Conference 2018

On November 12-13, De Nederlandsche Bank organized its 21st Annual Research Conference. This year the conference theme was "Unclogging the Credit Channel". The aim of the conference was to discuss the link between monetary policy, bank lending, and the real economy. The program featured two keynote speeches by Simon Gilchrist and Atif Mian, eight paper presentations and a policy panel.

In his keynote speech Simon Gilchrist (New York University) analyzed the economic consequences of forming a monetary union among countries whose financial markets are subject to varying degrees of distortions. Due to customer-market considerations financial shocks affect firms' pricing decisions, influencing mark-ups and market shares across countries. When applied to the eurozone crisis, the interaction of customer markets and financial frictions explains several phenomena that conventional models cannot reconcile. First, the pricing mechanism is consistent with empirical facts. Specifically, the evidence suggests that the tightening of financial conditions in the euro area periphery between 2008 and 2013 weakened the downward pressure on prices due to the emergence of substantial and long-lasting economic slack. Second, the tightening is strongly associated with an increase in price mark-ups in the periphery. This framework can explain why countries in the periphery managed to avoid debt-deflation in the face of persistent economic slack and how the "price war" between the core and periphery has impeded the adjustment process through which the latter economies tried to regain competitiveness.

Atif Mian (Princeton University) discussed in his keynote speech the role of credit expansions and agents' beliefs in the formation of housing bubbles and financial cycles. He presented empirical evidence showing that U.S. zip codes more exposed to the 2003 acceleration of the private label mortgage (PLS) securitization market witnessed a sudden and large increase in mortgage origination and house prices from 2003 to 2006, followed by a collapse in house prices during 2006-2010. During the boom, cities with higher PLS-market exposure were more likely to see a large increase in house prices despite substantial new construction; these cities experienced a severe bust after 2006. Mian pointed out that most of the marginal home-buyers brought into the housing market by the acceleration of the PLS market were short-term buyers or "flippers". These marginal buyers had lower credit scores and higher ex post default rates. Speculation by such home-buyers contributed to a large rise in transaction volumes during 2003-2006 and to the onset of the mortgage default crisis in 2007.

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no-one has any real idea about what happens behind the scenes. FinTech and payments are interesting for students because of all the new players emerging such as Adyen", said Bolt.

It takes two to tango
During his lecture, Bolt emphasised the two-sidedness of the payments market. "Consumers as well as retailers have to be simultaneously convinced of the need for new payments innovations. A nightclub is a good example of this two-sidedness. Men often have to pay a steep entry fee, while women can get in for free. This uneven pricing structure can offer benefits: if there were an entry fee for women, and they chose to spend their evening differently as a result, then men would also be less likely to go. And fewer men at the nightclub on Friday evening would also attract fewer women. These network effects are typical in a two-sided market: a market in which a platform wants to get all users on-board by setting the optimal price for both sides of the market. That's also how it works in payment systems."

Key function in the economy
"This professorship at the VU combines really well with my work at DNB", said Bolt. "The payment system performs a key function in the economy. It is a dynamic and complex field where the interests of a large number of parties meet. Price determination, competition and safety are important issues. New regulation and innovations will shake up traditional business models. Confidence in banks and in payment systems, privacy issues and cybersecurity already play a major role. More research and a new ››

The policy panel discussion focused on the changing nature of the credit process and its implications. Simon Gilchrist talked about measures of financial distress that can predict future economic activity. He stressed that there is a weak relationship between economic activity and inflation which poses challenges for monetary policy. Next, Atif Mian discussed trends and cycles in credit growth since the 1980s. He drew attention to secular trends in global economy which might be driving the global credit cycle and emphasized the role of macroprudential policy in controlling credit cycles. Finally, Leonardo Gambacorta (BIS) described technological innovation as an important factor for the evolving credit channel. He discussed the growth of FinTech and BigTech firms and their possible impact on resource allocation and financial intermediation. He pointed out that the financial stability implications of FinTech still need to be understood and that the evaluation should be done over a complete financial cycle.

Presented papers studied various aspects related to the credit channel of monetary policy. Oliver De Groot (ECB) analyzed whether the transmission of monetary policy differs in times when the policy rate is at the effective lower bound. He explored a signalling channel through which negative interest rates on reserves can be expansionary, even when deposit rates are bounded by zero. Despite lower interest on reserves resulting in a fall in bank net worth, the cut into negative territory signals that deposit rates will remain lower for longer, boosting economic activity and inflation.

Sarah Holton (ECB) argued that bank heterogeneity could affect both credit demand and supply. Using novel bank-specific survey data matched with balance sheet information on euro area banks, she presented evidence that following a conventional monetary policy shock, bank balance sheet strength influences not only credit supply but also credit demand. In addition, borrowers demand less credit from banks with weaker balance sheets, while banks more exposed to non-standard monetary policy measures increase credit supply.

Isabelle Roland (University of Oxford) examined whether weak productivity growth since the global financial crisis can be attributed to financial factors. She used firm-level data to estimate aggregate losses from credit frictions. The analysis showed that ex ante default assessments matter for capital allocation and that credit frictions depress output. Losses have been increasing since the great recession and are driven primarily by lower aggregate capital and not by misallocation of credit across heterogeneous firms. ››

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perspective are needed to determine what payment systems will look like in the future."

Papers accepted in A journals

Consumption uncertainty and precautionary saving by Dimitris Christelis, Dimitris Georgarakos, Tullio Jappelli and Maarten van Rooij; forthcoming in *The Review of Economics and Statistics*

Using responses from a survey among a representative sample of Dutch households, this paper elicits subjective expectations on future consumption and estimates the strength of precautionary saving. In a standard Euler equation framework, expected consumption risk induced by income risk or other sources of risk (such as health risk) raises expected consumption growth. However, neither expected consumption growth nor its variability is typically observed in household surveys. The first contribution of this paper is that it constructs measures of expected consumption growth and expected consumption risk. These measures are derived from answers to survey questions asking participants in the Dutch CentERpanel run at Tilburg University about their future consumption. The measures of expected consumption risk are associated with household characteristics in the direction suggested by economic intuition. For example, expected consumption risk is higher for the young, and positively correlated with self-employment and income risk.

The second contribution of this paper is that it inserts »

These losses are mainly due to frictions on SME credit markets. Falk Mezelis (ECB) studied how the regulation of shadow banking affects an economy at the ZLB, based on the estimation of a DSGE model with funding market frictions. He found that regulating shadow banks like investment funds results both in a milder recession and in a quicker recovery from ZLB episodes. This is because a recessionary demand shock that moves the economy to the ZLB has similar effects to a monetary tightening due to the inability to reduce the policy rate below zero.

Magdalena Rola-Janicka (University of Amsterdam) proposed a theory of crises based on rational expectations where the key frictions leading to the build-up of risk and to the crisis include limited liability, deposit insurance, and imperfect information. Recessions are often accompanied by an increase in corporate default and prolonged declines in business credit.

Wei Cui (University College London) presented a theory showing that credit and default cycles can result from variations in self-fulfilling beliefs about credit market conditions. In his model credit contracts reflect the expected default risk of borrowing firms. Self-fulfilling changes in credit market expectations generate sizable reactions in default rates together with endogenously persistent credit and output cycles, accounting for most of the corporate default volatility and over 20% of output volatility.
Saleem Bahaj (Bank of England) examined whether it is always the case that tighter capital requirements reduce bank lending as suggested by common wisdom. On the contrary, he showed that a bank may optimally respond to a higher capital requirement by increasing lending. This requires that the marginal loan generates positive residual cashflows in the states of the world where the bank just defaults. Since an increase in the capital requirement makes the bank safer, it makes the shareholders internalize such cash flows. He argued that this mechanism is empirically relevant.

Sebastiaan Pool (DNB) discussed the effect of government recapitalizations aimed at restoring banks' ability to repay deposits after a crisis. He examined two types of recapitalizations: immediate and delayed. In the steady state, both policies cause the banking sector to charge inefficiently low lending rates, leading to an inefficiently large capital stock. Raising bank equity requirements reduces this inefficiency. A delay in recapitalizations creates banking sector debt-overhang, which leads to inefficiently high lending rates, reduces credit supply and weakens the monetary policy transmission.

More information on the program, papers and presentations is available on the conference website.

DNB workingpapers

Since October 2018 the following Working Papers have been published, please use the following Link:

- **607** – Fiscal discipline in EMU? Testing the effectiveness of the Excessive Deficit Procedure by Jasper de Jong and Niels Gilbert – 27 September 2018
- **608** – Trust in other people and the usage of peer platform markets by Carin van der Cruijsen, Maurice Doll and Frank van Hoenselaar – 1 October 2018
- **609** – Spillovers of monetary policy across borders: International lending of Dutch banks, insurers and pension funds by Jon Frost, Patty Duijm, Clemens Bonner, Leo de Haan and Jakob de Haan – 1 October 2018

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these subjective expectations (rather than consumption realizations, as in previous research studies) in an Euler equation for consumption as to estimate the degree of prudence by associating expected consumption risk with expected consumption growth. The use of expectations instead of realizations addresses typical endogeneity concerns and the problem of expectation errors in the residual term. The estimates point to a coefficient of relative prudence of around 2. Assuming isoelastic utility, this suggests a coefficient of relative risk aversion of about 1. These findings are corroborated by employing different estimation methods (including IV and partial identification methods using weak assumptions) and several robustness checks. In terms of policy implications, this suggests that once uncertainty about future consumption possibilities increases (e.g. due to job uncertainty or due to income uncertainty related to the possibility of changes in government policy), households increase current savings and lower current consumption because of a precautionary motive (as to buffer against possible future income and consumption shocks).

On the value of virtual currencies by Wilko Bolt and Maarten van Oordt; forthcoming in *Journal of Money, Credit and Banking*

What drives the exchange rate of virtual currency such as Bitcoin? Why is it so volatile? What role does speculation play? Most economic analyses lack a formal treatment linking exchange rates to currency creation, speculative behavior and real growth in goods and services transactions. ››

- **610** – Life cycle assessment of cash payments by Randall Hanegraaf, Nicole Jonker, Steven Mandley and Jelle Miedema – 9 October 2018
- **611** – Ctrl+C Ctrl+pay: Do people mirror payment behaviour of their peers? By Carin van der Cruijsen and Joris Knoben – 22 October 2018
- **612** – Pension Funds Interconnections and Herd Behavior by Rob Bauer, Matteo Bonneti and Dirk Broeders – 30 October 2018
- **613** – Value-at-Risk prediction using option-implied risk measures by Kai Schindelhauer and Chen Zhou – 30 October 2018
- **614** – Forward Guidance and the Role of Central Bank Credibility by Gavin Goy, Cars Hommes and Kostas Mavromatis – 4 December 2018
- **615** – The Transmission of an Interest Rate Shock, Standard Mitigants and Household Behavior by Mauro Mastrogiacomo – 7 December 2018
- **616** – Bank Recapitalizations, Credit Supply, and the Transmission of Monetary Policy by Mark Mink and Sebastiaan Pool – 17 December 2018
- **617** – Does Housing Vintage Matter? Exploring the Historic City Center of Amsterdam by Lyndsey Rolheiser, Dorinth van Dijk and Alex van de Minne – 17 December 2018
- **618** – The economics of sharing macro-longevity risk by Dirk Broeders, Roel Mehlkopf and Annick van Ool – 18 December 2018

DNB Occasional Studies (new since October 2018)

Since October 2018 the following occasional studies have been published, please use the following link:

- **Nr 6 (2018):** Size of the banking sector: implications for financial stability
  Jan Kakes and Rob Nijskens (October 2018)
- **Nr. 7 (2018):** An energy transition risk stress test for the financial system of the Netherlands
  Robert Vermeulen, Edo Schets, Melanie Lohuis, Barbara Kölbl, David-Jan Jansen and Willem Heeringa (October 2018)

Published Articles in Journals

- **Financial institutions' business models and the global transmission of monetary policy**
  Isabel Argimon, Clemens Bonner, Ricardo Correa, Patty Duijm, Jon Frost, Jakob de Haan, Leo de Haan and Viktors Stebunovs
  Journal of International Money and Finance, 2019, 90, 99-117
- **Diminishing returns of QE from portfolio rebalancing**
  Jan Willem van den End
  The Journal of Investing, 2018, 27(4), 106-111
- **Is the Phillips curve still alive? Evidence from the euro area**
  Irma Hindrayanto, Anna Samarina and Irina Stanga
  Economics Letters, 2019, 174, 149-152
- **Does the media help the general public in understanding inflation?**
  David-Jan Jansen and Matthias Neuenkirch, *Oxford Bulletin of Economics and Statistics*, 2018, 80(6), 1185-1212

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We argue that as virtual currency becomes more established, the exchange rate will become less sensitive to the impact of shocks to speculators' beliefs.
Virtual currency has tapped a nerve in the global financial ecosystem. It does not only represent the emergence of a new form of currency but also a new payment technology to purchase goods and services. Virtual currency may move outside the scope of current financial institutions and enables direct payments between merchants and consumers across large distances. Importantly, as its supply is not controlled by central banks, speculative motives are widely believed to be an important factor for fluctuations in the exchange rate of virtual currency.

Our theoretical framework analyzes the exchange rate of virtual currency at its early-adoption stage and its main drivers. A unique combination of some of the properties of virtual currency – at least in this early stage – plays an important role in our model. First, virtual currency prices of goods and services are perfectly flexible with respect to changes in the exchange rate, since merchants tend to instantly adjust price quotes in virtual currency to the latest available exchange rate. Another important element is that the choice for making payments with virtual currency explicitly represents a choice for an alternative transaction technology: these payments are settled and processed through a peer-to-peer (non-bank) payment network that operates, verifies and validates virtual currency transactions. Network effects affecting payment choice are important for determining the ultimate ››

- **Cyclical patterns in risk indicators based on financial market infrastructuretransaction data**
  Monique Timmermans, Ronald Heijmans and Hennie Daniels
  Quantitative Finance and Economics, 2018, 2(3), 615-636

- **Recovery measures of underfunded pension funds: Higher contributions, no indexation, or pension cuts?**
  Leo de Haan
  Journal of Pension Economics and Finance, 2018, 17(4), 437-468

- **Can successful fiscal adjustments only be achieved by spending cuts?**
  Rasmus Wiese, Richard Jong-A-Pin and Jakob de Haan
  European Journal of Political Economy, 2018, 45, 145-166

- **What do we know about the effectiveness of macroprudential policy?**
  Gabriele Galati and Richhild Moessner
  Economica, 2018, 85(340), 735-770

- **X-efficiency and economies of scale in pension fund administration and investment**
  Gosse Alserda, Jacob Bikker and Sietske van der Lecq
  Applied Economics, 2018, 50(48), 5164-5188

- **The propagation of financial turbulence: Interdependence, spillovers, and direct and indirect effects**
  Zhongbo Jing, Paul Elhorst, Jan Jacobs and Jakob de Haan
  Empirical Economics, 2018, 55, 169-192

- **A descriptive model of banking and aggregate demand**
  Jochen Mierau and Mark Mink
  De Economist, 2018, 166, 207-237

- **Central bank independence before and after the crisis,** Jakob de Haan, Christina Bodea, Raymond Hicks and Sylvester Eijffinger, *Comparative Economic Studies*, 2018, 60(2), 182-202

For published articles in journals please use the following link

Forthcoming Articles in Journals

- **Bank switching and interest rates: Examining annual transfers between savings accounts**, Dirk F. Gerritsen and Jaap A. Bikker, *Journal of Financial Services Research*

- **The influence of government ideology on monetary policy: New cross-country evidence based on dynamic heterogeneous panels**, Federico Giesenow and Jakob de Haan, *Economics and Politics*

- **Finance, income inequality and income redistribution**, Adriaan van Velthoven, Jakob de Haan and Jan-Egbert Strum, *Applied Economics Letters*

- **Walk on the wild side: temporarily unstable paths and multiplicative sunspots,** Guido Ascari, Paolo Bonomolo and Hedibert F. Lopes, *American Economic Review*

- **Consumption uncertainty and precautionary saving,** Dimitris Christelis, Dimitris Georgarakos, Tullio Jappelli and Maarten van Rooij, *Review of Economics and Statistics*

- **On the value of virtual currencies,** Wilko Bolt and Maarten van Oordt, *Journal of Money, Credit and Banking*

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demand for virtual currency. Lastly, the growth of the supply of virtual currency is, to a large extent, predetermined. In line with this latter characteristic, future demand for virtual currency to make payments is one of the main sources of uncertainty in our model.

Our analysis shows that three components are important for the exchange rate. First, current use of virtual currency to make actual payments. Second, the decision of forward-looking investors to buy virtual currency (thereby effectively regulating its supply). Third, the elements that jointly drive future consumer adoption and merchant acceptance of virtual currency. We show that a steep increase in the exchange rate due to speculative motives is exactly what you would expect at the introduction of a potentially successful virtual currency. Moreover, the model predicts that, as virtual currency becomes more established, the exchange rate will become less sensitive to the impact of shocks to speculators' beliefs and their inflow into and outflow from the virtual currency market. As a result, our main model prediction undermines the common notion that excessive exchange rate volatility will prohibit widespread usage of virtual currency in the long run.

Forthcoming Articles in Books

- **ECB communication: effects on expectations**
  Jakob de Haan
  In: Jaques Ziller (ed.), *The European Central Bank's Communication: An Instrument of Monetary Policy and a Vector of Accountability*, Giappichelli

For forthcoming articles in books please use the following link

Published Articles in Books

- **Detection and explanation of anomalies in real-time gross settlement systems**
  Ron Triepels, Hennie Daniels and Ronald Heijmans
  In: Hammoudi S., Śmiałek M., Camp O., Filipe J. (eds) *Enterprise Information Systems*. ICEIS 2017. Lecture Notes in Business Information Processing, 2018, vol 321. Springer, Cham

- **Utility-equivalence of pension security mechanisms**
  Dirk Broeders, An Chen and Birgit Koos
  In: J.A. Bikker, *Pension Fund Economics and Finance*, 2018, Routledge, London, 233-250

- **The banknote designer and the banknote design manager: Who does what?**
  Hans de Heij
  International Banknote Designers Association, 2017, Lausanne

- **Pension Fund Economics and Finance: Efficiency, Investments and Risk-taking**
  Jacob Bikker (ed.)
  Routledge, 2018

- **Use-centred design of banknotes: getting started**
  Hans de Heij
  In: Ivan Montoya (ed.), *Banknote Management for Central Banks*, 2017, Risk Books

- **Anomaly Detection in real-time gross settlement systems**
  Ron Triepels, Hennie Daniels and Ronald Heijmans
  In: *Proceedings of the 19th International Conference on Enterprise Information Systems* 1, 2017, 433-441

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