DNB Research Program 2018

DeNederlandscheBank
EUROSYSTEEM

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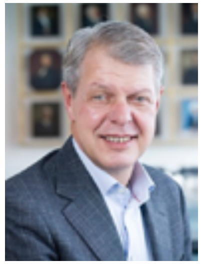
Foreword

The DNB Research Agenda outlines the ambitions for DNB research for the upcoming years. It aims for a more top-down approach in establishing the DNB annual research program, thereby contributing to the implementation of one of the Research Review Committee's recommendations. The Research Agenda has been approved by the "Regiegroep", consisting of the directors of several policy divisions, and has been discussed with DNB Governing Board members. It offers guidance for the formulation of individual research projects.

As a rule, new projects will only be approved if they fit into the longer-term views as outlined in the DNB Research Agenda.

The DNB Research Agenda identifies seven themes: the effects of unconventional monetary policies, the new normal for monetary policy, the dynamics of inflation, credit supply, financial stability and financial regulation, sustainability, and payments and market infrastructure. These themes will replace the themes previously used in the DNB Research Program.

The DNB Research Program 2018 outlines the research projects for 2018.



Jakob de Haan
Head of Research DNB

Monetary policy

The global financial crisis had a profound impact on the practice of monetary policy in a range of countries. The crisis challenged important elements of the pre-existing dominant view that monetary policy should be aimed at price stability and should use just one instrument: a short-term policy interest rate. Being confronted with a massive financial crisis and its repercussions as well as stubbornly low inflation rates, central banks resorted to a large number of unconventional policy tools. When they encountered the effective lower bound (ELB), central banks extended the set of assets they were willing to purchase, these operations being known generically as Quantitative Easing (QE). This changed the composition and vastly increased the size of their balance sheets.

In light of these changes, four sets of important questions arise:

1. Effects of unconventional monetary policies

Although a substantial amount of research suggests that unconventional policies have contributed to increasing output growth and inflation, less is known about their impact on the exchange rate and how this in turn affects the macro economy (changing exchange rate pass-through to inflation). In addition, more research is needed on the (unintended) consequences of unconventional monetary policies on: housing markets, risk taking by financial institutions and markets, zombie-lending (misallocation of capital), and the behaviour of (different types of) consumers (e.g. due to shortfalls in the pension system). With interest rates still at or close to the ELB the effectiveness of unconventional monetary policies going forward increasingly depends on fine-tuning the fiscal-monetary policy mix while controlling sovereign risk.

■ Projects 2018

2. The new normal for monetary policy

Important changes in the economy, notably the low level of inflation and sluggish economic growth, created new challenges for monetary policy decision-making. A major issue here is that some key variables (like the natural rate and expectations) are non-observable, while they play a key role in theoretical models. Important questions include: how reliable are estimates of the natural real rate of interest and its drivers; can monetary policymakers influence the natural rate, and if so, how? What is the role of expectation formation in relation to wage and price dynamics? To address these issues, a proper theoretical framework is needed, in which the uncertainty about key variables is taken into account. If and when economic conditions turn more favourable, how should monetary policy be normalized (exit from QE; should central banks eventually return to the traditional mode of intervening at the short end of the market; what is the optimal size and composition of the central bank balance sheets) and what operational framework is best suited to effectively and efficiently transmit the desired monetary stance?

■ Projects 2018

3. Dynamics of inflation

It seems that the dynamics of wage and price inflation has changed. This raises several important questions: do we need new theories to explain (wage) inflation, what is the role of (expected) fiscal policy in this regard, what is the role of technological developments (ICT), globalization and changes in market structures (platforms, contestability), how do changes in labour market composition affect wage growth, is central bank independence enough to deliver price stability? Has the relationship between the output gap, unemployment and (wage) inflation dynamics fundamentally changed?

If so, how should the Phillips curve be modelled? What determines the equilibrium labour income share on the macro and sectoral level? How are (inflation) expectations formed? What is the role of inflation expectations in wage and inflation dynamics? What are the implications of these issues for the ECB's monetary policy – and in particular for the appropriateness of its current strategy?

■ Projects 2018

4. Credit supply

In the aftermath of the crisis, credit supply by euro area banks dropped. This raises several issues: Why are banks not lending (demand or supply constraints)? What can monetary policy do to stimulate bank lending? What is the relationship between capital and liquidity requirements and bank lending? What are the consequences of lower access to bank credit for small and medium-sized enterprises in the euro area? What impact does a distressed banking sector have on productivity growth? For the last two questions: what can be learned from the US where banks were recapitalized much faster after the crisis?

In order to address several of these questions, high priority will be given to develop theoretical models for realistically modelled monetary policy in which debt overhang of firms and/or banks is combined with demand shocks. Such models can also be used to analyse asymmetric effects of monetary policy in a heterogeneous monetary union and can give guidance for identification in empirical work on several of the issues raised above.

■ Projects 2018

Theme 1 Effects of unconventional monetary policies

New projects

1. **QE and stock market bubbles**
2. **Forward guidance, bounded rationality and expectation formation**
3. **Country-specific risk premium shocks and central bank policies**
4. **The response of tail risk perceptions to unconventional monetary policy: An analysis for the euro-area**

Continued projects

5. **'Banks' net interest income in a low interest rate environment**
6. **QE and portfolio rebalancing in a monetary unionn**
7. **Forward guidance and the role of central bank credibility under heterogeneous beliefs**
8. **Cross-border spillover effects of Quantitative Easing in the Euro area**

New projects

1. QE and stock market bubbles

Tom Hudepohl, Ryan van Lamoen and Nander de Vette

This paper assesses the relationship between QE and the search for yield by investors. In a low interest rate environment, investors may increase their risk-taking behavior, which reduces risk premia and increases asset prices. As a result, the risk of asset bubbles rises. Previous research has been conducted on the relationship between asset bubbles and monetary policy in general. This paper focuses on the specific role of QE by exploring the relationship with asset bubbles, based on the Shiller P/E ratio of the biggest stock indices of ten European countries.

2. Forward guidance, bounded rationality and expectation formation

Maarten van Rooij, Olivier Coibion (University of Texas, Austin), Dimitris Georgarakos (ECB) and Yuriy Gorodnichenko (University of California, Berkeley)

Recent theoretical research challenges the effectiveness of forward guidance and relates this to k-level thinking (a particular form of bounded rationality) by people and firms. The term k-level thinking refers to which degree individuals take actions of others into account when forming expectations (k refers to the number of iterative steps individuals take in their thoughts when forming expectations). However, there is virtually no evidence that k-level thinking matters for macroeconomic outcomes. In this research, we use the Dutch Household Survey to investigate the links between k-level thinking and expectation formation.

3. Country-specific risk premium shocks and central bank policies

Emmanuel De Veirman, Dennis Bonam and Gavin Goy (University of Amsterdam (UvA)) and Tinbergen Institute)

The euro area crisis featured increased heterogeneity in risk premia on sovereign debt. We show that heterogeneous risk premium shocks are amplified in monetary unions. We investigate the effectiveness of lender- and borrower-based macro-prudential policy tools as well as unconventional monetary policy (debt purchases within the SMP) in dealing with country-specific shocks. Our paper (1) focuses on heterogeneity in a monetary union; (2) investigates the effects of credit supply shocks; (3) investigates the influence of macro-prudential policy; (4) investigates the influence of unconventional monetary policy.

4. The response of tail risk perceptions to unconventional monetary policy: An analysis for the euro-area

Annelie Petersen, Nander de Vette and Sweder van Wijnbergen

This paper evaluates the response in perceived tail-risk to the implementation of unconventional monetary policy by the ECB. By using option-implied distributions we measure downside risk in the Euro/Dollar exchange rate and Stoxx 50 equity index. An event-study is used to quantify whether or not the ECB managed to significantly decrease the risk of a crash in equity markets as well as in the exchange rate.

Continued projects

5. 'Banks' net interest income in a low interest rate environment
Leo de Haan, Raymond Chaudron and Marco Hoeberichts

Recent research – both for Dutch banks and banks in other countries – has shown that net interest income is not affected much by a flattening of the yield curve. This study investigates for 40 Dutch banks which factors are important in this regard, focusing on characteristics of the Dutch banking sector (e.g., market power, capitalization, credit risk, other sources of income such as fees and commissions).

6. QE and portfolio rebalancing in a monetary union
Kostas Mavromatis, Renske Maas and Serdar Kabaca (Bank of Canada)

We use a two country DSGE model for a currency union with portfolio rebalancing to analyze the effects of QE in a monetary union. We aim to quantify the effects of asymmetric behavior from the investors' side first, and, second, from the governments' side following a drop in the supply of long-term assets. Households in each region (Core and Periphery) can hold short- and long-term assets issued by both regions. Importantly, home and foreign assets, but also assets issued within the same region, are imperfect substitutes. Such structure allows for endogenous term premia which depend on the direction of portfolio rebalancing. We account for various asymmetries by allowing home bias coefficients in households' portfolios to different across the two regions as well as different fiscal policy stance. We consider a QE shock. Our model accounts for the different country size and as such can approximate the ECB's capital key. We consider a QE shock which affects each country individually, according to its size.

7. Forward guidance and the role of central bank credibility under heterogeneous beliefs
Kostas Mavromatis, Cars Hommes (UvA) and Gavin Goy (UvA and Tinbergen Institute).

This paper studies the macroeconomic effects of central bank forward guidance when central bank credibility is endogenous. In particular, we take a stylized New Keynesian model with an occasionally binding zero lower bound constraint on nominal interest rates and heterogeneous and boundedly rational households. The central bank uses a bivariate VAR to forecast, not taking into account the time-variation in the distribution of aggregate expectations. In this framework, we extend the central bank's toolkit to allow for the publication of its own forecasts (Delphic guidance) and the commitment to a future path of the nominal interest rate (Odyssean guidance). We find that both Delphic and Odyssean forward guidance increase the likelihood of recovery from a liquidity trap. While Odyssean guidance alone can increase ex post macroeconomic volatility and thus reduce welfare, it still appears to be more powerful.

8. Cross-border spillover effects of Quantitative Easing in the Euro area
Anna Samarina, Christina Bräuning, Yvo Mudde and Robert Vermeulen

This project aims at quantifying the stock and flow effect of the PSPP on euro area bond yields since March 2015. Furthermore, it investigates the spillover effects of PSPP-purchases in one country on government bond yields in other countries in the euro area. We distinguish spillovers from countries' purchases, grouped by country's credit rating and bonds'maturity segment. For the analysis of stock effects, we will use a panel regression or SUR with country-bond-time dimension,

with quarterly bond yields regressed on their own cumulative quarterly purchases, purchases of their close substitutes, PSPP announcements leading to different expectations in the size of the program, economic news, foreign factors (VIX as measure of global volatility) and bond characteristics.
The analysis of flow effects is based on a similar model specification as the one on stock effects, but the methodological approach would have to account for high frequency data issues – volatility and autocorrelation of error terms.

Theme 2 The new normal for monetary policy

New projects

1. Revisiting the central bank's lender of last resort function

2. Fear of secular stagnation and the natural interest rate

3. Detecting liquidity traps

4. Re-assessing monetary policy shocks

5. Now-casting under structural change

6. Look for the stars: estimating the natural rate of interest

7. Estimating behavioural learning equilibria

Continued projects

8. Fiscal consolidations and finite horizons

9. Forecasting with large panel data sets

New projects

1. Revisiting the central bank's lender of last resort function

Joost Bats, Jan Willem van den End and John Thoolen

This study revisits the central bank's lender of last resort (LOLR) function in times of systemic liquidity stress. Three alternatives for the future design of the LOLR function are compared, based on academic literature and an empirical analysis on the differences in liquidity supply in the major jurisdictions during and after the period of systemic liquidity stress. It is argued that a fixed rate full allotment policy (as currently applied by the Eurosystem) is a very effective instrument when markets become dysfunctional, but can make banks dependent on central bank funding for a prolonged period of time. To prevent this, incentives can be embedded in the operational framework to discourage over-proportional use of the monetary policy operations and/or a designated Liquidity Insurance Facility could be considered. While the former keeps the LOLR function (largely) integrated in the regular monetary policy framework, the latter represents a separate facility that can be activated in times of systemic liquidity stress, with special terms and conditions. Both have their pros and cons.

2. Fear of secular stagnation and the natural interest rate

Paolo Bonomolo and Valentina Gavazza (Stockholm University)

What is the role of expectations and pessimism in explaining the low and persistent pattern of interest rates after the financial crisis? Potential output is not directly observable: when a recession occurs it is not clear if the effects are permanent (like in a secular stagnation) or transitory. The more the agents are pessimistic, the higher the probability they attribute to the first scenario, leading to a lower natural interest rate. We quantify the contribution of pessimism on the natural rate in Europe and the U.S., estimating a DSGE model under the assumption that agents cannot observe whether shocks to technology are permanent or transitory. We model pessimism as ambiguity aversion in the sense of Klibanoff Marinacci and Mukerji (2005).

3. Detecting liquidity traps

Paolo Bonomolo, Yildiz Akkaya (Konjunkturinstitutet) and Ingvar Strid (Sveriges Riksbank)

Major economies experienced a period of low interest rates and low inflation. A possible explanation is that they fell in a liquidity trap. This is an equilibrium situation in which the policy rate is at the effective lower bound and inflation fluctuates around a negative or very low value. Ending in a liquidity trap is a big risk for the policymaker and we develop an econometric strategy to quantify this risk. We show that the methodology is able to recognize when the probability of converging to a liquidity trap is high before the interest rate approaches the lower bound.

4. Re-assessing monetary policy shocks

Paolo Bonomolo, Björn van Roye (ECB) and Alistair Dieppe (ECB)

We develop a framework to quantify the effects of monetary policy taking into account the possibility of a structural decrease in the growth rate of GDP. When such a situation occurs we have two consequences: i) the natural interest rate is lower: ii) part of the variation in GDP growth is attributed to structural factors that are independent of monetary policy. Both these effects downplay the estimated effects of monetary policy.

5. Now-casting under structural change

Maurice Bun, Jos Jansen (Ministry of Finance) and Jasper de Winter

Policymakers and economic agents have to make decisions based on incomplete and inaccurate information about current economic conditions.

For this reason, the now-casting of key economic aggregates, i.e. forecasting their current state, is of great importance. The recent now-casting literature has developed an extensive toolkit to summarize large amounts of statistical information observed at different frequencies and with non-synchronous release dates. In this project we analyze the robustness of several now-casting models to structural change. We furthermore correct for structural change by including intercept corrections and evaluate the predictive ability of the resulting models.

6. Look for the stars: estimating the natural rate of interest

Irma Hindrayanto, Mengheng Li and Siem Jan Koopman (Free University Amsterdam (VU))

The natural rate of interest (r*) and the growth rate of potential output are important policy benchmarks widely used by central banks to determine the stance of an economy. It is well recognized that r* is subject to low-frequency fluctuations as shown in the seminal paper of Laubach and Williams (2003). To track its evolution over time in a parsimonious manner, we propose a 2-stage multivariate unobserved components (MUC) model with similar cycles. In the first stage we pin down the time-varying trend growth rate of real output using Okun's law. In the second stage we model the necessary gap variables using similar cycles and insert the calculated trend growth rate in the full MUC model to estimate r*. We apply our model to US, UK and EA data.

7. Estimating behavioral learning equilibria

Kostas Mavromatis, Cars Hommes (UvA) and Ozden Tolga (UvA)

We estimate NKE models under a simple misspecification learning equilibrium that arises from expectational frictions. The representative agent does not know the true underlying mechanism of the economy, but acts as an econometrician and uses a simple univariate sample autocorrelation learning rule to form her expectations about the future state of the economy. Over time, she learns the best univariate rule and her expectations become self-fulfilling, giving rise to Behavioral Learning Equilibibria (BLE). Under fairly general conditions, we show that NKE models can be estimated under a BLE using standard Bayesian estimation methods without using projection facilities. We apply our estimation approach to two models that are commonly used in the literature: the baseline 3-equation NKPC à la Woodford (2003), and the workhorse Smets-Wouters (2007) model. Our results show that the empirical fit and forecasting performance of both models under BLE improve compared to the Rational Expectations models, while we observe important differences in our parameter estimates and the propagation mechanism of the model.

Continued projects

8. Fiscal consolidations and finite horizons

Kostas Mavromatis and Joep Lustenhouwer (University of Bamberg)

We analyze fiscal consolidations using a New-Keynesian model where agents have finite planning horizons and are uncertain about the future state of the economy. Both consumers and firms are infinitely lived, but only plan and form expectations up to a finite number of periods into the future. The length of agents' planning horizons plays an important role in determining how spending cuts or tax increases affect output and inflation. We find that for low degrees of relative risk aversion spending-based consolidations are less costly in terms of output losses, in line with empirical evidence. A stronger response of monetary policy to inflation makes spending-based consolidations more favorable as well. Interestingly, for short planning horizons, our model captures the positive co-movement between private consumption and government spending observed in the data.

9. Forecasting with large panel data sets

Andreas Pick

This research project investigates methods for forecasting with large panel data sets. An application is that of Bernoth and Pick (2011, JBF), who investigate forecasts of banking and insurance vulnerabilities. The current project aims to further the understanding of forecasting in such data sets, to develop new forecasts, and compare those forecasts to existing forecasting methods.

Theme 3 Dynamics of inflation

New projects

1. Time varying expectation formation process

2. Non linearity in the long-run Phillips Curve

3. On the sources of business cycle fluctuations in small open economies

4. The Phillips curve through the lens of the unobserved components model

5. Heterogeneity in inflation forecasts

6. Does it matter how you target? Performance of point, band, and range targets for inflation

7. Expectations formation and anchoring: new evidence from a high frequency survey

Continued projects

8. Finite horizons and the monetary/fiscal policy mix

New projects

1. Time varying expectation formation process

Paolo Bonomolo, Guido Ascari (University of Oxford and University of Pavia), Hedibert F. Lopes (INSPER) and Leonardo Melosi (Federal Reserve Bank of Chicago)

We study how the time variation in the expectations formation process affects the dynamics of inflation. This project has two papers: in Walk on the Wild Side: Multiplicative Sunspots and Temporarily Unstable Paths we develop a framework in which in some periods expectations are anchored to the target, in other periods they are more based on past observations. In Private Beliefs Formation and Macroeconomic Risk we use the implications of this framework to identify the empirical determinants of the expectations formation process (and its time variation). Ultimately, we try to assess if and how monetary policy can affect it.

2. Non linearity in the long-run Phillips Curve

Paolo Bonomolo and Guido Ascari (University of Oxford and University of Pavia)

In a situation with low inflation and the nominal interest rate at the lower bound, the Central Bank may affect inflation expectations by increasing the inflation target. We focus on a particular risk of such a policy: a negative impact on potential output. The presence of staggered prices and wages may imply a suboptimal level of production: if firms do not set their price optimally, they end up adjusting the quantity produced. We estimate how this inefficiency depends on the level of long-run inflation (the inflation target) using both time series and structural models.

3. On the sources of business cycle fluctuations in small open economies

Paolo Bonomolo, Vesna Corbo (Sveriges Riksbank) and Jesper Lindé (Sveriges Riksbank)

We study how much small open economies are dependent on global factors. We use Swedish data (and in a later phase, possibly Dutch data) to quantify the big role of financial linkages in explaining the dynamics of GDP and inflation after the financial crisis. In particular, when global financial stress increases, the effects are similar to a supply shock: inflation and GDP move in opposite direction. This can account for the so called “twin puzzle”: the missing disinflation during the financial crisis, and the low inflation during the financial recovery.

4. The Phillips curve through the lens of the unobserved components model

Irma Hindrayanto and Irina Stanga

The Phillips curve has come under close scrutiny in the wake of the global financial crisis, as inflation remained persistently low in most advanced countries, and empirical evidence pointed to changes in the relationship between inflation and domestic slack (output gap or unemployment gap). We extend the work by Harvey (2011), who made a relatively simple modification to the backward-looking Phillips curve by replacing lagged inflation with an unobserved random walk component to represent inflation expectation. We apply the same unobserved components model as in Harvey’s framework to the 5 largest Euro Area countries and test whether the Phillips curve coefficient has indeed changed after the crisis in 2008.

5. Heterogeneity in inflation forecasts

Kostas Mavromatis, Jakob de Haan, Cars Hommes (UvA), Domenico Massaro (Catholic University of Milan) and Adriana Cornea Madeira (University of York)

We use a unique dataset on Consensus Forecast data to analyze inflation and output growth dynamics accounting for heterogeneity in expectations. Specifically, respondents in our dataset are called upon forming expectations about inflation, output growth, interest rates and other macro aggregates in the US, one and two years ahead. Our dataset contains monthly forecasts of individuals and spans from 1989 to 2017. We develop and estimate a behavioral model of inflation dynamics with heterogeneous agents. Heterogeneity in agents refers to their forecasting rules. Each agent has her own forecasting rule but we allow agents to switch among those rules over time, depending on the forecasting performance of each rule in the past. We experiment with both forward looking and backward looking forecasting rules.

6. Does it matter how you target? Performance of point, band, and range targets for inflation

Anna Samarina and Nikola Mirkov (Swiss National Bank)

We construct a new database of inflation targets for 55 countries over the period 1990-2017. We distinguish three types of inflation targets used by central banks: point target, point target with a tolerance band, and range target. Using this database, we examine how effective different types of targets are in achieving price stability. That is, whether the distinction between inflation target types matters for inflation performance, its volatility, and expectations. We analyze how these effects depend on countries' economic, fiscal, financial, and institutional conditions.

7. Expectations formation and anchoring: new evidence from a high frequency survey

Federica Teppa, Gabriele Galati and Richhild Moessner (BIS)

This paper helps understanding whether inflation expectations have contributed to low inflation in the euro area. It uses a new type of survey to investigate the behavior of expectations about euro area inflation and their anchoring properties, and how it has evolved since the financial crisis. The survey covers 8 years of weekly data on expectations about short-, medium- and long-term inflation, and 4 years of quarterly data on the whole probability distribution of expectations. The paper extends earlier work on this topic (DNB WPs 283 and 509).

Continued projects

8. Finite horizons and the monetary/fiscal policy mix

Kostas Mavromatis

Fiscal policy in the US has been documented to have been the leading authority in the '70s (active fiscal policy and high inflation), while having switched to fiscal discipline following Volcker's appointment (passive fiscal policy and disinflation) onwards. Most papers in the literature focus on taxes as the main instrument to stabilize debt when fiscal policy is passive. However, US fiscal policy has at times fluctuated between raising taxes (Reagan tax increases) and cutting expenditure (Clinton expenditure cuts). I analyze those facts through the lens of a three-regime New-Keynesian model with a Blanchard-Yaari structure. Monetary policy switches between a passive and an active regime. Fiscal policy fluctuates not only between passive and active, but also between using taxes and federal expenditure, when passive. I show that allowing for switching across different fiscal instruments, along with a finite horizon structure, is crucial in order to account for the swings observed in the debt-to-GDP ratio and other features of US data. I show that there is a strong expectations effect driving the debt ratio upwards when agents anticipate future cuts in spending. Interestingly, the current stance of monetary policy may either strengthen or mitigate this effect.

Theme 4 Credit supply

New projects

1. Does public money creation crowd out private money creation in the euro area?

2. Bank bailouts, debt-overhang and macroeconomic fluctuations

3. Bank lending to SMEs in the Netherlands

Continued projects

4. Monetary spillovers across borders: international lending of Dutch banks, insurers and pension funds

5. The transmission of an interest rate shock, standard mitigants and individual behaviour: An empirical investigation using loan level data for the Netherlands

6. Heterogeneity and asymmetric macroeconomic effects of changes in loan-to-value limits

New projects

1. Does public money creation crowd out private money creation in the euro area?

Gracjan Bachurewicz (University of Groningen), Jakob de Haan, Mark Mink and Sebastiaan Pool

This project examines whether public money creation (e.g. central bank reserves or short-term government debt) crowds out money creation by private financial intermediaries and thereby enhances financial stability. We employ OLS estimations and SVARs and Local Projection methods to estimate the impulse response functions following an increase in public money creation. Tentative results show that public money creation tends to crowd out private money creation.

2. Bank bailouts, debt-overhang and macroeconomic fluctuations

Mark Mink and Sebastiaan Pool

This projects examines how the capitalization of the banking sector affects monetary transmission. We include a tractable and flexible banking sector in an otherwise conventional New-Keynesian model. We introduce a crucial friction in this banking sector: banks receive state aid as soon as losses on their assets exceed the value of their equity. This state aid can take two different forms: the government can nationalize undercapitalized banks, or it can provide a guarantee such that undercapitalized banks can continue to exist. In anticipation of a nationalization, banks set inefficient low lending rates. This effect is much weaker in anticipation of a guarantee because in expectation it is, once received, (implicitly) repaid as the profitability of the bank recovers. After undercapitalized banks have received a guarantee, they calculate inefficiently high lending rates and reduce lending. The inefficient low lending resulting from this is comparable with the effect of a classic debt overhang as identified by Myers (1977).

3. Bank lending to SMEs in the Netherlands

Jasper de Winter, Mark Mink, Bahar Öztürk and Jakob de Haan

Using supervisory data, the project will analyze lending to SMEs by the three large banks in the Netherlands with the aim to get a better understanding about potential lending bottlenecks to SMEs. We will start by analyzing whether credit supplied and the conditions of the loans provided are related to balance sheet indicators and the profitability of firms, as well as the sector and region in which the firm is operating. We also intend to differentiate between new loans provided and credit supplied under existing credit lines.

Continued projects

4. Monetary spillovers across borders: international lending of Dutch banks, insurers and pension funds

Leo de Haan, Jon Frost, Patty Duijm, Clemens Bonner and Jakob de Haan

As part of a broader project under the International Banking Research Network (IBRN), a DNB team is analyzing the relationship between policy interest rates in the Netherlands and in host countries on the international lending of Dutch banks, insurers and pension funds. Key questions include how monetary policy is transmitted across borders, which channels are the most important in explaining such spillovers and whether banks are "special" in the sense that their behavior is different from other financial institutions.

5. The transmission of an interest rate shock, standard mitigants and individual behavior: An empirical investigation using loan level data for the Netherlands

Mauro Mastrogiacomo

We examine the transmission of an interest rate shock to households. We analyze standard mitigants, such as delays due to a future interest-rate-reset-date, tax deduction of the interest paid on mortgages, the amortization of different mortgage types and possible conjunctural factors. We also include the possibility of behavioral responses, where households can alleviate the effect of a shock by reducing their debt using voluntary repayments.

6. Heterogeneity and asymmetric macroeconomic effects of changes in loan-to-value limits

Emmanuel De Veirman and Jasper de Jong

Using Dutch data, we document that changes in regulatory limits for loan-to-value ratios on mortgage loans can have non-linear effects on the macro-economy as a tightening in the cap increases the fraction of households whose borrowing is constrained. We show that a moderate change in the degree of loan-to-value heterogeneity can substantially alter the effects of changes in loan-to-value caps. Our paper (1) shows how heterogeneity in terms of access to liquidity affects macroeconomic demand; (2) concerns the relationship of the housing market and the business cycle; (3) investigates which policies can help to reduce the pro-cyclicality of the housing market; and (4) measures the effects of a change in credit supply.

Financial stability and financial regulation

The financial crisis has also led to major changes in financial sector supervision. Micro-prudential requirements have become stricter, although there is also a tendency (at least in some countries) towards less regulation. Within the euro area, the SSM has become responsible for banking supervision, but not for supervision of other financial institutions. Nowadays most central banks have become responsible for maintaining financial stability. A wide array of macro-prudential instruments can be applied, but so far, there is only limited experience. Early detection of (systemic) risks is important to successfully use both micro- and macro-prudential instruments. This calls for a further development of quantitative tools (using granular data) that can inform policymakers on (systemic) risk both in the banking and non-banking financial sector, such as early warning indicators, financial or credit cycle models, contagion mechanisms, and stress test models. As residential and commercial properties make up a substantial part of non-financial private sector assets, and relate to a significant share of financial sector lending and investment, developments in these markets have a profound impact on economic and financial stability. It is important to better understand the strong boom-bust pattern in the housing market, the causes of the slow reaction of the supply side of the housing market, and the relationship of the housing market with the business cycle.

In light of this, several important questions arise concerning financial stability and financial regulation including:
Which tools and policies can help to reduce the pro-cyclicality of the housing market? How do macro-prudential policy changes and regulatory reforms affect the transmission mechanism of monetary and macro-prudential policy? What is the impact of a country's financial structure (bank-based vs. market-based financing) on systemic risk? What is the impact of "fintech" and financial innovation (like CoCos) on the sustainability of the (successfulness of) business models of financial institutions and what are the implications for financial services provision, the sustainability of business models of financial institutions, financial markets, financial stability and micro- and macro-prudential supervision?
How does financial criminality impact the reputation of financial institutions and prudential risks? Do developments like low interest rates, high levels of debt and leverage, and increasing protectionism threaten financial stability?

■ Projects 2018

Theme 5 Financial stability and financial regulation

New projects

1. Bank-based versus market-based financing: implications for systemic risk

2. Cyclical relationships in banks' regulatory capital for the banking system

3. Demand and supply reservation price indices for the housing market

4. Does housing vintage matter? Exploring the historic city center of Amsterdam

5. European banks after the global financial crisis: Peak accumulated losses, twin crises and business models

6. Asset allocation, investment beliefs and portfolio performance

7. Loan to value ratio, loan guarantees, and mortgage defaults: evidence from Dutch banks' loan level data

8. Being in good hands: Deposit insurance and peers' financial sophistication

9. Tax-exempted inter-generational transfers: do they reduce household mortgage debt?

10. Till debt do us part: divorces, economic outcomes and a test of moral hazard

11. Consumer reaction to booms and busts in the housing market

12. Disclosure, interbank linkages, and bank instability

13. Value-at-Risk prediction using forward-looking risk measures

14. Systemic risk and bank regulation

Continued projects

15. European CoCo issuances: What choices do banks face?

16. Creating constant quality liquidity indices in thin markets

17. Challenges of macro-prudential policy

18. The impact of sovereign debt ratings on euro area cross-border holdings of euro area sovereign debt

19. Identifying risks in Central Counterparties

20. Networks of Financial Market Infrastructures: Fire walls or fire lighters?

21. Outlier detecting in FMI risk indicators

22. Liquidity Coverage Ratio in a payments network: Uncovering contagion paths

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24. Do shocks to financial intermediary capital move financial markets?

25. Regulation, supranational bank supervision, and the corporate structure of foreign affiliates

26. Bank relationships after foreign takeover

New projects

1. Bank-based versus market-based financing: implications for systemic risk

Joost Bats and Aerdt Houben

This paper assesses the merits of bank-based versus market-based financing by exploring the relationship between financial structure and systemic risk. A fixed effects regression model is estimated over a panel of 22 OECD countries. The results show that bank-based financing generates systemic risk while market-based debt and especially stock financing reduce systemic risk. A threshold regression model estimated over the same panel suggests that banks no longer contribute to systemic risk when there is little bank-based financing. In the case of relatively market-based financial structures, the influence of banks on systemic risk is low.

2. Cyclical relationships in banks' regulatory capital for the banking system in the Netherlands

Laurence Deborgies Sanches and Marno Verbeek (Erasmus University of Rotterdam (EUR))

Pro-cyclicality is a major problem for monetary policy (bank lending channel) and regulators (financial stability). Our analysis of the cyclicality issue in a unified framework overcomes three drawbacks identified in the literature:

1 focus on one factor (buffer, credit ratings, provisions)
2 not considering banks' reactions to their macro-economic environment
3 no general view of the banking system as a whole

This shall lead to robust econometric analyses of our preliminary results about the cyclicality characteristics of the Dutch banking system' required capital observed in our previous paper and to a cyclicality index which is easy to integrate into modelling (stress-testing) and policy actions.

3. Demand and supply reservation price indices for the housing market

Dorinth van Dijk and Marc Francke (UvA)

We use the Van Dijk, Geltner & Van de Minne (DNB WP 583, 2018) method to estimate reservation price indices for buyers and sellers in the Dutch and U.K. housing market. We relate features of these indices to regional characteristics and mortgage markets. We expect that the seller reservation price index dynamics are different in regions with high mortgage debt, since these sellers might be more loss averse due to negative equity problems. We also look at the differences between commercial and residential reservation price dynamics.

4. Does housing vintage matter? Exploring the historic city center of Amsterdam

Dorinth van Dijk, Lyndsey Rolheiser (Harvard) and Alex van de Minne (MIT)

Typically, research treats a home as a bundle of land and structure values. Conceptually, structures are easily produced, and thus are supplied elastically. With elastic supply, it is reasonable to assume replacement cost should be equivalent to the value of the structure. Land, on the other hand, is supplied inelastically and is non-reproducible. Land values are therefore affected by a number of demand factors. The research presented here examines these relationships through a different lens. We claim that certain structures are supply-constraint as well. Namely, we focus on the effect of different structure vintages on price dynamics. Older vintages are not easy to reproduce, if possible at all. Thus, one might expect that the value of an older vintage diverges from its replacement cost.

5. European banks after the global financial crisis: Peak accumulated losses, twin crises and business models
Leo de Haan and Jan Kakes

This paper takes stock of European banks' accumulated losses since 2007 and relates these to bank characteristics. In line with previous studies, we find that large, market-oriented banks were particularly hit by the 2007-2009 global financial crisis whereas smaller, retail-oriented banks weathered these years relatively well. In the subsequent years, however, the picture reversed and retail-oriented banks were most affected. Over the entire period, medium-sized banks suffered most losses and often needed to be rescued with state aid. This suggests that measures to contain systemic risk, such as capital surcharges and bail-in requirements, are as relevant for these institutions as they are for the largest banks.

6. Asset allocation, investment beliefs and portfolio performance
Leo de Haan and Dirk Broeders

Using 2007-2016 data, we decompose returns of Dutch pension funds according to the key investment decisions, i.e. asset allocation, benchmark, timing and selection decisions. The return data for bonds, equities, real estate and other assets are reported mandatory and therefore free of reporting biases. In extension to previous papers, we assess the impact of benchmark selection, i.e. pension funds using proprietary benchmarks instead of using a standard benchmark. The returns on a pension fund's own proprietary benchmark reflects its investment beliefs.

7. Loan to value ratio, loan guarantees, and mortgage defaults: evidence from Dutch banks' loan level data
Leo de Haan and Mauro Mastrogiacomo

Using loan level data on mortgage loans of the three largest Dutch banks originating from 1996 to 2015, we analyze the determinants of the incidence of mortgage arrears. We find that the loan-to-value ratio (LTV) and the debt-service-to-income ratio (DSTI) are significantly positively associated with the probability of mortgage arrears. The results also suggest that government loan guarantees reduce credit risk. Moreover, several mortgage loan characteristics, such as interest only loans and the underwater status of the loan, increase credit risk. The age of the loan applicant diminish credit risk. The purpose of the loan is also a determinant: when the purpose is debt consolidation or the financing of a partly commercially used real estate, credit risk is higher.

8. Being in good hands: Deposit insurance and peers' financial sophistication
Mauro Mastrogiacomo, Francesco Caloia (University of Venice) and Giacomo Pasini (University of Venice)

We study the effect on savings of the Deposit Guarantee Scheme (DGS) reform in the Netherlands. We derive optimality conditions for savings allocation in a DGS environment and we empirically investigate how bank accounts allocations of the Dutch households changed as a response to the reform. Moreover, we highlight the indirect effect on consumption and stock market participation and the role of peers in influencing people's financial decisions.

9. Tax-exempted inter-generational transfers: do they reduce household mortgage debt?
Mauro Mastrogiacomo and Yue Li (VU)

We study the effect of the extension of a tax benefit to intergenerational transfers that was into play in the aftermath of the credit crisis and aimed to reduced indebtedness, specifically for underwater mortgages. Using newly collected administrative micro data with high frequency, we are able to identify voluntary repayments on mortgage loans. We find that during the period of the introduction of the tax benefit, voluntary repayments have increased, but not only for the treated group. This suggests that stimulating intergenerational transfers can be an effective tool to shorten household balances, but more targeting is needed if one wants to reduce high indebtedness of for instance underwater mortgage loans.

10. Till debt do us part: divorces, economic outcomes and a test of moral hazard

Mauro Mastrogiacomo, Yeorim Kim (VU and Netspar), Stefan Hochguertel (VU and Netspar) and Hans Bloemen (VU and Netspar)

We investigate the evolution of several life-cycle outcomes, such as labor participation, wealth, and pension entitlements, before and after divorce. We show remarkable changes in all these variables when the life-cycle is organized along the time to and from divorce. We show a significant effect of the Dutch mortgage insurance on negative home equity, on the chance to strategically divorce. We exploit a RDD as this insurance is only available for properties below a legislated threshold, while negative home equity became common only after 2009. We show that observationally similar couples above the thresholds experienced significantly less often a divorce.

11. Consumer reaction to booms and busts in the housing market

Maarten van Rooij (DNB), Dimitris Christelis (University of Naples), Dimitris Georgarakos (ECB), Tullio Jappelli (University of Naples) and Luigi Pistaferri (Stanford University)

Booms and busts on the housing market lead to vast changes in housing wealth and have strong impact on the business cycle via the effects for consumption. In this research, we use the Dutch Household Survey to investigate the consumer reaction depending on whether shocks are perceived as long-lasting and compare the results across different types of shocks with different degrees of liquidity.

12. Disclosure, interbank linkages, and bank instability

Razvan Vlahu, Christian König-Kersting (University of Heidelberg) and Stefan T. Trautmann (University of Heidelberg)

In the aftermath of the financial crisis, greater regulation and efforts to increase the transparency in the banking industry have been at the forefront of the policy debate. Rigorous stress testing has been introduced as a key method of assessing the financial sector's ability to withstand large scale correlated shocks to multiple (macro) economic factors. This study explores the effects of different degrees of information about the fundamentals of individual banks as well as information about economic linkages across banks, on depositor behavior and thus financial stability.

13. Value-at-Risk prediction using forward-looking risk measures

Chen Zhou and Kai Schindelhauer (EUR)

Due to a growing risk awareness and the tightening of regulatory requirements, there is a strong need for accurate risk estimation and consequently, well-performing and reliable Value-at-Risk (VaR) prediction strategies. This project investigates the prediction of Value-at-Risk (VaR) using option-implied information obtained by the maximum entropy method. The maximum entropy method provides an estimate of the risk-neutral distribution based on option prices. Besides commonly used implied volatility, we obtain implied skewness, kurtosis and quantile from the estimated risk-neutral distribution. We will use the implied risk measures to predict future realized VaR.

14. Systemic risk and bank regulation

Chen Zhou and Jakob de Haan

In response to the recent global financial crisis, micro-prudential regulations have been tightened in most countries to strengthen the stability and resilience of the banking system. This project aims at investigating how micro-prudential regulatory schemes of different countries are related to their banks' risk profiles and systemic risk. We employ a bank-level systemic risk indicator as developed by van Oordt and Zhou (2017). This systemic risk measure can be decomposed into two subcomponents: individual risk and systemic linkage. We examine the relationship between micro-prudential regulation and banks' systemic risk and its decomposition.

Continued projects

15. European CoCo issuances: What choices do banks face?

Martijn Boermans, Tomislav Ladika (UvA), Ioana Neamtu (UvA), Natalya Martynova (Bundesbank) and Sweder van Wijnbergen

This paper assesses the choices banks face when they issue contingent convertible debt instruments. Building on an emerging literature on the theoretical mechanisms we develop a simple model of the choice not to issue versus issuing CoCos with certain characteristics. To test the predications of the model we construct a granular CoCos database focusing on individual bonds. The results are important for academics to better understand the trade-offs banks face when issuing CoCos as the empirical literature is still in its infancy. The outcomes are relevant to regulators and policymakers as they inform them about the underlying trends in the CoCo markets.

16. Creating constant quality liquidity indices in thin markets

Dorinth van Dijk

Market liquidity is an important measure used by researchers, policymakers, and practitioners to infer the current market situation. For example, many authors provide evidence that developments of market liquidity foreshadow price developments. Policymakers look at market liquidity to identify hot markets and brokers use liquidity to assess the market situation. Most institutions use the average time on market as market indicator. The average, however, might provide a misleading view regarding actual market liquidity. Currently, there is no measure that creates an operational measure for constant quality market liquidity specifically for thin markets. Analogous to existing regional constant quality house price indices, I propose to create regional constant quality liquidity indices.

17. Challenges of macro-prudential policy

Gabriele Galati and Richhild Moessner (BIS)

While macroprudential policy has become a primary policy to support financial stability and has become increasingly popular in policymaking, it faces important challenges. We discuss several key challenges in taking the analysis of macroprudential policy forward. The focus is on the challenge of coordination between macroprudential and monetary policy – particularly in the current environment where central banks are exiting or planning to exit from a highly accommodative stance. We also discuss other important analytical challenges: the coordination with fiscal policy, regulatory arbitrage, the regulation of the infrastructure of the financial system and the relationship with green finance.

18. The impact of sovereign debt ratings on euro area cross-border holdings of euro area sovereign debt

Leo de Haan and Robert Vermeulen

During the euro area sovereign debt crisis, there were frequent and large downgrades of euro area countries' sovereign debt, especially for the GIIPS countries. These downgrades led to huge shifts in cross-border holdings of euro area sovereign debt. The markets calmed after Mario Draghi's famous "Whatever it takes" speech. With the introduction of the Public Sector Purchase Program (PSPP) by the ECB early 2015, the ECB purchases euro sovereign debt, as part of its Quantitative Easing operations. Using detailed data for the euro area, we investigate the impact of rating changes on cross-border euro sovereign bond holdings of euro area investors. We are able to distinguish investors by country of residence and sector, i.e. banks, insurance companies, pension funds, investment funds. The sample period is 2009-2015 and the frequency is quarterly.

19. Identifying risks in Central Counterparties

Ronald Heijmans, Alinda Heemskerk, Tatu Laine (Bank of Finland) and Kasperi Korpinen (Bank of Finland).

This paper shows how the robustness of a central counterparty (CCP) can be measured. We create a BoF-PSS2 simulator based CCP simulation tool that is based on the tool. We develop a method to measure whether a CCP lives up to the PFMI requirement with respect to the failure of large banks (2 large banks should be able to fail). Furthermore, we measure the effectiveness of the netting algorithm. We investigate four different scenarios: 3 theoretical market types (homogeneous, linear and exponential in terms of the size of the clearing members) and 1 realistic case based on real data. Furthermore, it shows how this tool can be used to analyze transaction data of a CCP and how policymakers and overseers could obtain information by using this tool. Policy relevance: Policymakers (CCP and financial stability) and overseers get information on the risks and dynamics in a CCP they would not be able to get from traditional (econometric) methods.

20. Networks of Financial Market Infrastructures: Fire walls or fire lighters?

Ronald Heijmans, Froukelien Wendt (IMF) and Dieter Wang

This paper develops an approach to a network analysis model for authorities to analyze the importance of FMIs and their participants in a network as well as potential contagion channels following defaults, market shocks, or cyber-attacks. The network could also form the basis for stress testing methodologies. Data about exposures between FMIs and market participants, coupled with analytical techniques are expected to improve the understanding of the safety and robustness of FMIs, and their participants, and their role in financial networks at a country, regional and global level, including the tipping point up to which FMIs absorb shocks, beyond which they spread risks rather than contain them.

21. Outlier detecting in FMI risk indicators

Ronald Heijmans and Chen Zhou

We use extreme value theory to detect unusual behavior in FMI risk indicator time series developed by Berndsen and Heijmans (2017). We describe how usual or unusual an event is by looking at the probability such an events occurs in e.g. number of times per year. We both investigate one time series at the time (univariate) and several indicators combined (multi variate) using the local outlier factor method (LOF). We try to link outliers found to economic (stress) events. This paper will help FMI experts to set the right thresholds for risk indicators. Both for individual indicators and many indicators combined.

22. Liquidity Coverage Ratio in a payments network: Uncovering contagion paths

Richard Heuver and Ron Bernsen (Tilburg University (TiU))

Using payment data, we create an approximation of LCR, which creates the possibility to anticipate liquidity coverage statistics at daily level. Moreover, it enables us to place this statistic in a network perspective opening the possibility to look at secondary round effects and locations in the payment network that are most vulnerable. In 2018 a pilot has been started in cooperation with divisions Supervision and Resolution in which we try to implement the model using actual LCR figures of the largest European banks as well as the Dutch banks.

23. Bank run detection using machine learning

Richard Heuver and Ron Triepels (TiU)

We apply machine learning techniques to look for signals of bank runs in the main Euro large value payment system TARGET2. We investigate which source data and granular level deliver most accuracy by testing the results of the algorithms to available data on bank runs in the past. Bank run signaling can be of importance to Payments, Prudential Supervision, Banking

Resolution, Financial Markets and Financial Stability.

24. Do shocks to financial intermediary capital move financial markets?

Mark Mink, Iman van Lelyveld and Rodney Ramcharan (USC, Price School of Public Policy)

One of the key objectives of financial regulation and supervision is to ensure that financial intermediaries are adequately capitalized. The recent financial crisis has amply illustrated the need for such regulation, as a sudden worsening of financial intermediaries´ capital positions can destabilize financial markets as well as the real economy. In this research, we exploit the Securities Holding Statistics (SHS), a large and granular database on the securities holdings of euro area financial intermediaries to examine how shocks to these intermediaries' capital positions spill over into financial markets. The outcomes of this research can contribute to financial stability and regulation policies, and to our understanding of the link between financial intermediary capitalization and asset price formation in financial markets.

25. Regulation, supranational bank supervision, and the corporate structure of foreign affiliates

Razvan Vlahu and Natalya Martynova (Deutsche Bundesbank)

In the context of cross-border banking, we study how differences between home and host country regulatory arrangements, as well as the introduction of a supranational supervisor, affect the corporate structure of foreign affiliates. When going abroad, banks can operate as either a subsidiary or as a branch. Subsidiaries are separate legal entities regulated and supervised by host country's authorities, thus protected by limited liability. Branches are an integral part of the parent bank, enjoying no limits on the ability to transfer funds cross-border within the banking group. They are also subject to regulation and supervision on a consolidated basis in the home country. We show that when the host country's regulation allows for both structures, foreign banks may circumvent stricter regulation abroad and prefer to operate through a branch structure. We also show how the presence of a supranational supervisor, who limits the scope of "ring-fencing" arrangements in the host country, may affect the structure of foreign affiliate. By increasing subsidiaries' ability to easily move funds cross-border, while leaving the limited liability of the affiliate unaffected, a centralized supervision may increase the preference for a subsidiary structure.

26. Bank relationships after foreign takeover

Razvan Vlahu, Steven Poelhekke and Vadym Volosovych (EUR)

This empirical study will investigate the impact of foreign acquisitions on funding of acquired non-financial companies. Put in different words, we will try to assess whether non-financial companies which rely on funding from banks, change (completely/partially) their borrowing counterparty upon being acquired by a foreign entity. Do such firms rely on (multinational) banks for their funding and other bank services, or do they adopt the bank relationships of their new foreign owners? Do they keep both relationships and split bank services along particular lines? These questions further help to shed light on the importance of a banking system with home country multinational banks, versus a banking system with smaller domestic banks with a national scope and a set of local offices of foreign multinational banks.

Sustainability

The sustainability of economic growth has become a major issue, not only for monetary policy-making but also for financial supervision. Fundamental changes in the environment could affect economic and financial stability and the safety and soundness of financial firms, with clear potential implications for monetary and supervisory policies alike. Changes in public policy to address environmental risks, as well as wider factors, such as technological innovation, may affect the economy and financial system. For instance, in view of the Paris Agreement, a major goal for governments is to reduce the emission of carbon dioxide which implies a transition towards more sustainable energy sources. This may affect the macro-economic environment for monetary policy. Likewise, it may affect the riskiness of portfolios of financial institutions (e.g. there may be a risk that carbon-intensive assets may become 'stranded' as part of a low carbon transition). These portfolios may also be affected by other possible environmental developments, such as climate change and the increasing adoption of sustainable investment practices. How can these risks be measured?

Sustainability also has a socio-economic aspect, reflecting the need for the fruits of sustainable economic growth to be shared among the population. For instance, the wealth and income distribution (between households but also between production factors) is often considered an important dimension of sustainability. Likewise, sustainability may require social security arrangements (such as pensions) to be self-financed so that the risks are not transmitted to future generations.

As to sustainability, DNB research will address issues like: how will the energy transition affect economic sectors? How will (sudden) changes in the energy transition affect exposures of financial institutions and financial stability? How are climate risks priced in at financial markets? How can the energy transition be implemented efficiently and effectively, given its international dimension and sometimes conflicting (short-term) interests of jurisdictions? What role do financial markets and new financial instruments have in financing the transition? How should the energy transition and the transition towards a circular economy be financed?
As pointed out above, sustainability is more than climate risk. From that perspective DNB research will also address issues like: What are the drivers of TFP-growth at the firm or sector level? What is the contribution of access to finance, zombification, capital misallocation and inter-firm spillovers for TFP-growth at the aggregate level? How do monetary policy and macro-prudential policies affect wealth and income distribution? How does incompleteness of financial markets and the implied heterogeneity in terms of access to liquidity affect macro-economic demand? In view of several changes (like increasing share of temporary workers, reduced bargaining power of trade unions) another important issue is how will the future labour market look like. What is the relationship between income and wealth distribution and robust growth? How can the pension systems be designed (and reformed) in such a way that the risks are shared equally between generations (including future generations)?

■ Projects 2018

Theme 6 Sustainability

New projects

1. Misallocation in Dutch firms
2. Competition and income and wealth distribution
3. Market concentration and the labour share of income
4. Central bank policies and inequality
5. Trust in other people and the usage of online peer-to-peer markets
6. Does monetary policy affect income inequality in the euro area?
7. Asymmetric shocks in EMU: private or public risk sharing?
8. Understanding the pension expectation gap in the Netherlands: a micro analysis

Continued projects

9. Carbon footprints and pension funds' portfolio investment trade-off
10. The employment effects of corporate income tax shocks: New evidence and some theory
11. The effectiveness of the Stability and Growth Pact: Testing adherence to fiscal recommendations
12. Sustainable cash payment system
13. Impact of financial inclusion and financial literacy on financial stability
14. Financial literacy and pension expectations

New projects

1. Misallocation in Dutch firms

Maurice Bun and Jasper de Winter

In many industrialized countries there has been an aggregate productivity slowdown since the financial crisis. An increasing number of studies has analyzed the role of misallocation of capital and labor, i.e. dispersion in marginal products, to explain the observed slowdown in aggregate productivity. In this project we analyze the relative contribution of a large number of sources of misallocation using panel data of Dutch firms. Among other things, we quantify the role of adjustment costs, imperfect information, heterogeneous production technologies and financial frictions.

2. Competition and income and wealth distribution

Andrea Colciago and Rajssa Mechelli (Milano Bicocca)

The aim of this work is to understand how the extent and the form of competition between firms in the market for final goods affects households' income and wealth distribution. We plan to study how the dynamics of technology affects the degree of competition in the market for goods and how this shapes the distribution of income and wealth. To the best of our knowledge there is no general equilibrium framework available in the literature which studies this issue. Our project aims at providing policy prescriptions, such as dynamic antitrust policies or ad hoc fiscal policies, that could counteract the rise inequality due to an increase in market concentration.

3. Market concentration and the labor share of income

Andrea Colciago and Rajssa Mechelli (Milano Bicocca)

We consider a framework characterized by complete markets and by firms endowed with heterogeneous level of technology. In this setting we will study the classical issue of the division of income between capital and labor. If technological changes advantage the most productive firms in each industry, product market concentration will rise as industries become increasingly dominated by superstar firms with high profits, large market shares and by a low share of labor in firm value-added and sales. This, in turn, negatively affects the share of income distributed to labor.

4. Central bank policies and inequality

Andrea Colciago, Anna Samarina and Jakob de Haan

This paper takes stock of literature examining the effects of central bank policies (conventional and unconventional monetary policy and macro-prudential policy) on income and wealth inequality. It also considers the extent to which household income and wealth heterogeneity affects the transmission of monetary policy.

5. Trust in other people and the usage of online peer-to-peer markets

Carin van der Cruijsen, Maurice Doll and Frank van Hoenselaar

The use of online peer-to-peer marketplaces is growing rapidly. For policymakers it is important to understand what drives consumers' usage of these markets. Based on detailed survey data collected among a representative panel of Dutch consumers, we report that trust in other people is a key driver of usage. People who in general trust others are 10 percentage points more likely to use online peer-to-peer markets than distrusting people. Less uncertainty about the reliability of the other person, the goods and services offered, and the payment can stimulate usage of peer-to-peer markets by a wider audience.

6. Does monetary policy affect income inequality in the euro area?

Anna Samarina and Anh D.M. Nguyen (Bank of Lithuania)

This project focuses on distributional effects of monetary policy and examines how it influences income inequality in 10 EMU countries over the period 1999–2014, through wage and asset prices channels. The impact of expansionary monetary policy on income distribution may depend on the channels considered. On the one hand, it can reduce income inequality by boosting economic activity and wage growth. On the other hand, loose monetary policy raises asset prices; this benefits high-income households more, which could result in higher income inequality.

7. Asymmetric shocks in EMU: private or public risk sharing?

Patrick Kosterink, Dennis Bonam, Matthijs Zaal and Jakob de Haan

We examine the importance of asymmetric shocks in EMU by replicating and extending some recent work on this issue and discuss the implications for the need to have more private risk sharing (via financial markets) and/or public risk sharing by some form of European risk sharing scheme.

8. Understanding the pension expectation gap in the Netherlands: a micro analysis

Federica Teppa and Maurice Doll

This paper investigates how much Dutch consumers trust their own pension funds, and the pension fund industry in general, and how this is linked to (perceived) fund performance. The empirical analysis is based on new questions recently collected from the CentERpanel and the DNB Household Survey. The study contributes to the ongoing policy debate about the need to reform the pension system in the Netherlands, where individuals often have too high expectations about the level and the volatility/risk of their future pensions (see, for example, Position Paper for the National Pension Dialogue, Speech Frank Elderson during the DNB Pensioenenseminar 2017).

Continued projects

9. Carbon footprints and pension funds' portfolio investment trade-off

Martijn Boermans and Rients Galema (Utrecht University)

In this study we empirically test how Dutch pension funds allocate their stocks towards firms with high and low carbon footprints. We analyze the determinants and trade-offs pension funds face when deciding to investment in companies with lower carbon emissions. We build a new harmonized measure of carbon footprints using unique information from portfolio investments. The results have important ramifications for practitioners and supervisors who value the transition to a low carbon economy and aim to promote a more sustainable financial sector.

10. The employment effects of corporate income tax shocks: New evidence and some theory

Andrea Colciago, Vivien Lewis (Bundesbank) and Branka Matyska (Leuven University)

We aim to assess whether cuts to corporate income tax rates can be a useful tool to boost job and business creation. We will provide empirical evidence concerning the effects of corporate tax income shock on firms creation (and destruction) and employment. Then we will estimate reduce forms effects using panel-regressions estimated on US state data. We will then provide a DSGE model with search in the labor market and endogenous firms dynamics along the lines of Colciago and Rossi (2015), augmented with a fiscal side. The model will be aimed at addressing the main facts identified in the empirical analysis.

11. The effectiveness of the Stability and Growth Pact: Testing adherence to fiscal recommendations

Jasper de Jong and Niels Gilbert

Sound public finances are an important requirement for EMU to function properly. To this end, the Stability and Growth Pact (SGP) operationalized the so-called Excessive Deficit Procedure (EDP). The SGP/EDP is controversial, but any direct test of its effectiveness is missing. In this paper, we construct a real-time database with all fiscal recommendations, and the revisions thereof, given to EMU member states under the EDP. We then investigate whether these recommendations are effective in inducing fiscal effort.

12. Sustainable cash payment system

Nicole Jonker, Randall Hanegraaf (Utrecht University), Steven Mandley (Utrecht University) and Jelle Miedema

In this study we examine the environmental impact of the cash payment system. We identify the environmental hotspots in the cash payment system and we conduct scenario analyses in order to assess how the environmental impact may be reduced, while maintaining the current level of safety, reliability and efficiency. This study contributes to improving the sustainability of the financial sector.

13. Impact of financial inclusion and financial literacy on financial stability

Anneke Kosse, Nicole Jonker and Lisa van Winden

The objective of this research project is to gain insight into the influence of financial inclusion and financial literacy on financial stability. We will start with conducting interviews with experts and an extensive survey of the literature. Based on the results we will identify, if necessary, topics for future empirical research. Understanding the impact of financial inclusion and financial literacy will help DNB in determining DNB's ambition and activities in the area of financial inclusion and financial education.

14. Financial literacy and pension expectations

Maarten van Rooij, Rob Alessie (University of Groningen) and Remko Struik

A side-effect of low interest rates is that many pension funds are underfunded, have not been able to index the pensions for a number of years and may have to cut pensions when shortfalls do not recover. We investigate whether employees have updated their expectations regarding retirement age and replacement rate (both in terms of levels and uncertainty), also in view of the major policy changes since 2013 (gradual increase in statutory retirement age and reduced accrual rates). Moreover, we analyze whether the updating of pension expectations is related to financial literacy or other personal characteristics.

Payments and market infrastructures

Both innovation-driven developments and regulatory measures like PSD2 are transforming the payments ecosystem rapidly. Payment behaviour changes, e.g. there is a downward trend in the use of cash. New players enter the scene. The market structure can change. This will affect the way the central bank can pursue its goal of promoting the smooth functioning of the payment system as well as DNB's supervisory role. Fintech may also have an impact on monetary policy transmission. Moreover, financial market infrastructures may be affected by developments in potential new payment methods or financial instruments, such as crypto-currencies and the underlying technologies. It must remain possible for over-the-counter transactions to be settled in cash as long as consumers still want this.

In the light of the changing landscape, the following research questions on payments and market infrastructures are key:
Research on payment innovations, notably the block chain technology, is important, as well as research on the effects of new regulation. What drives the acceptance of traditional and new payment instruments? Is there a minimum level of cash usage below which commercial parties are not interested anymore in maintaining a good infrastructure for cash? How can we improve the banknote in terms of cost and usage? What is the impact of e-commerce on payment use? What is the influence of new regulation and "fintech" on retail payments? How much trust do people have in new and traditional payment instruments and payment service providers, and does it matter?

Market infrastructures such as TARGET2, TARGET2-Securities and central counterparties produce a lot of granular transaction data on a daily basis.
How can we use that data to obtain information on a. the monetary policy implementation of the Eurosystem, b. risk indicators within an FMI and between FMIs, c. potential liquidity problems, and d. detect outliers?
Many innovations in this field are technology-driven, notably the distributed ledger technology. It is key to investigate their disruptive consequences (not only in the financial sector) and to gain detailed hands-on experience of such new technologies in order to answer questions that relate to their suitability of a potential implementation by central banks and how they need to be supervised.

■ Projects 2018

Theme 7 Payments and market infrastructures

New projects

1. Trust in payment instruments and payment service providers

2. International comparison of liquidity efficiency of LVPS

Continued projects

3. FinTech and regulation: impact on retail payments

4. E-commerce: use, growth and pricing

5. Virtual currencies: dynamics and monetary aspects

6. Ctrl+C Ctrl+pay? Do people mirror payment behaviour in their neighbourhood?

7. Dutch retailers and their acceptance of cash and cards, is there a turning point?

8. What drives bitcoin adoption by retailers?

9. The influence of contactless payments on consumers' payment behaviour

New projects

1. Trust in payment instruments and payment service providers

Carin van der Cruijsen and Nicole Jonker

For central banks it is key to understand the usage of payment instruments and payment service providers in the changing payment eco-system. The purpose of this research is to cast light on consumers' trust in traditional and innovative payment instruments (contactless payments, mobile payments, cryptocurrencies), and in traditional and new payment service providers. We research the drivers of trust and to what extent trust matters for payment instrument usage and the intention to share data with payment service providers. Thereby, we examine the influence of stakeholders in the payment chain.

2. International comparison of liquidity efficiency of LVPS

Anneke Kosse, Ronald Heijmans, Bank of Canada, Danmarks Nationalbank, ECB, Banque de France, Bundesbank, Reserve Bank of India, Central Bank of the Russian Federation, Bank of England, FED Board, Fed New York, University of California, BIS

Using interbank transaction data from large value payment systems world-wide, this study aims to assess the use of liquidity in these payment systems and to study the effect of payment system characteristics (e.g. availability of liquidity saving mechanism and number of participants in the system), as well as macro factors (country GDP, banking concentration) on liquidity efficiency.

Continued projects

3. FinTech and regulation: impact on retail payments

Wilko Bolt

FinTech concerns the application of new technologies in the financial sector, in particular, in payments. New technologies drive innovations and influence competitive conditions via entry and exit. At the same time, new regulation intends to lower potential barriers to entry (such as, foreclosure by incumbent parties). In particular, the PSD2 regulation is intended to give access to account and payment information to third parties. What is the impact of new entry and regulation on the payment landscape? New parties also want a "part of the payment pie". How do (incumbent) banks react and what will their future business model look like? By developing a (theoretic) IO model, we want to address these questions.

4. E-commerce: use, growth and pricing

Wilko Bolt and Bas Butler

E-commerce is rapidly growing. Buying online represents a technology that will fundamentally change the way industries operate. Although E-commerce sales remain a smaller percentage of overall sales than "brick-and-mortar", yet the percentage continues to increase at a (much) faster rate than overall sales. Who are the online users, how do they pay and what preferences do they have? What does it mean for market structure, competition and its effect on product pricing? How do network effects come into play? Using recent Dutch survey results ('two waves') on E-commerce this paper tries to empirically assess above questions by applying multivariate logit/probit regression models, identifying demand and preference characteristics and its potential effect on payment use, production cost, price levels and inflation ("the Amazon effect").

5. Virtual currencies: dynamics and monetary aspects

Wilko Bolt and Maarten van Oordt (Bank of Canada)

Bitcoin was launched in 2009 and has recently attracted much attention from economists, financial media, and even governments. Its increased attention was fueled by the sudden "explosion" and volatility in the exchange rate of Bitcoin by the end of 2013. Can economic theory help explaining these extreme price movements and its dynamics, and does virtual currency pose a threat or an opportunity for monetary policy? Building on Bolt and van Oordt (2016), this research project tries to further assess the dynamics and monetary aspects of virtual currency.

6. Ctrl+C Ctrl+pay? Do people mirror payment behavior in their neighborhood?

Carin van der Cruijsen and Joris Knoben (Radboud University)

For stakeholders in the payment system seeking to stimulate the usage of efficient, safe and sustainable payment instruments, it is key to know the drivers of consumers' payment instrument choice. We research the relevance of peer effects for payment behaviour. We use detailed payment diary data to relate the payment instrument choice of Dutch consumers to the payment instrument choices people in their geographical environment make. Moreover, we test whether the presence and strength of the relationship depends on the region's degree of social cohesion.

7. Dutch retailers and their acceptance of cash and cards, is there a turning point?

Nicole Jonker, Nicole Engel and Esther van den Kommer

In the Netherlands most retailers accept both cash and card payments. However, during the past years, the number of retailers who decline cash payments and only accept card payments seems to be growing. In this study we will examine the perception of the Dutch retailers towards the different means of payment, to what extent retailers do not accept cash payments, what factors drive this decision and at what moment they may choose to stop accepting cash payments. From DNB's task to ensure the smooth functioning of the retail payment system, it is important to gain insight into the reasons behind the decision to decline cash by retailers and the expected outlook for the near future.

8. What drives bitcoin adoption by retailers?
Nicole Jonker

Cryptos, like bitcoin are in the spotlights. They have the potential to disrupt the payment system, as they enable payers and payees to transfer money without making use of services of payment service providers. We aim to gain insight into the current adoption rate and adoption intention by e-businesses. Questions addressed include: "Which factors promote the adoption and adoption intention of cryptos as a means of payments and which factors act as barriers?" This study is the first to provide insight to the possible influence of cryptos on the online payment system using a large, representative sample of online retailers.

9. The influence of contactless payments on consumers' payment behavior
Nicole Jonker and Codruta Rusu (Austrian Central Bank)

We examine the adoption and usage of contactless payments by consumers in Austria and the Netherlands, two countries which are comparable in many respects, but differ in cash intensity. We examine to what extent the adoption patterns are alike and which payment instruments are substituted by contactless payments: cash or the traditional payment cards. We will track people's point-of-sale (POS) payments using payment diary data as well as survey data for Austria and the Netherlands. The study provides insights into the speed of adoption of payment innovations when it comes to retail payment systems.