DNB Research programme 2014

The DNB Research programme 2014 has four thematic themes:
1. *Monetary strategy, business cycles, and price stability;*
2. Financial stability and macro-prudential supervision;
3. Micro-prudential supervision and conduct of financial institutions; and
4. Financial literacy and behaviour of households and companies.

The focus on the themes listed below does not mean that *all* research should fit into these thematic themes. A substantial part of research capacity will continue to be directed towards modelling and forecasting. That is why the fifth theme in the DNB Research programme is:

5. Modelling and forecasting.

As part of our increased emphasis on modelling the interaction between the real and financial sectors, in 2014 a major effort will be made to include this interaction better in Delfi, our structural model of the Dutch economy. A taskforce under the leadership of Maarten van Rooij is responsible for implementing the action plan further developing Delfi. The primary ambition for our DSGE model in 2014 is to introduce a financial friction into the model in order to capture the interaction between the real and financial sectors of the Dutch economy in a meaningful way.

Also several specific projects in the DNB research programme 2014 focus on the interaction between the real and financial sectors.

As follows from the specific projects for 2014 (as listed below), the distribution of research time across the various themes is non-proportional.

The research projects for 2014 are listed below. Some fit into more than one theme.

Research projects 2014

1. Monetary strategy, business cycles and price stability

Capital market frictions and aggregate fluctuations
Andrea Colciago, Pierre Lafourcade

We develop a quantitative DSGE model characterized by housing and frictions in the market for capital. We will extend the approach by Gertler and Karadi (2011) to characterize financial intermediaries and households that face endogenous balance sheet constraints. We plan to study the cyclical properties of the main macroeconomic variables in response to shocks, in particular a shock to the quality of collateral. The latter helps simulating a crisis with features close to that of the current economic downturn.

Who creates jobs over the business cycle?
Andrea Colciago, Antonella Trigari (Bocconi)

We will analyse the business cycle dynamics of job creation (JC) and job destruction (JD) by different categories of firms, grouped according to size, age and other criteria. Next we will quantify the contribution to overall JC and JD variability over the business cycle and decompose it between the variability due to each category. To give an example, we plan to identify the cyclicality and variability of JC and JD by new firms versus that played established firms and will asses their contribution to overall JC and JD variability. Initially we will focus of the U.S. adopting the rich dataset provided by the Business Employment Dynamics (BED) program providing quarterly series of statistics on gross job gains and gross job losses. Subject to data availability, we also plan to provide empirical evidence at an international level.

Survey on communication about unconventional monetary policy
Jakob de Haan, David-Jan Jansen, Richhild Moessner

In the wake of the global financial crisis the ECB and other major central banks have engaged in unconventional monetary policy measures. This project provides a survey of the literature on the communication about unconventional monetary policy and identifies questions for future research.

Effect of the zero lower bound, forward guidance and unconventional monetary policy on interest rate sensitivity to economic news in Sweden'
Jakob de Haan, David-Jan Jansen, Richhild Moessner

This project studies whether the sensitivity to economic news of interest rates implied by interest rate swaps in Sweden was affected by the zero lower bound of the policy rate. We interpret the sensitivity of longer-term yields to economic news as a measure of the effectiveness of monetary policy at the zero lower bound. We also investigate whether the sensitivity of interest rate swaps to economic news was affected by the introduction of forward guidance and unconventional monetary policies by the Riksbank.

Firm volatility and the Philips curve
Emmanuel de Veirman

This paper assesses whether inflation is more responsive to fluctuations in real activity when firms are more volatile. Endogenous pricing models imply that when firms are more volatile, they reprice more frequently, such that the Phillips curve is steeper. To the extent that firm volatility is higher during economic downturns, this suggests that monetary policy may have smaller real effects, and stronger inflationary effects, during recessions than in normal times. This paper empirically tests the theoretical implication that the Phillips curve is steeper when firms are more volatile.

Estimating the Effects of Permanent Oil Price Shocks without Univariate Assumptions about the Long-Run Oil Price
Emmanuel de Veirman, Felipe Labbé (University of Chicago)

This paper estimates the real effects of oil price shocks. Unlike the existing literature, we explicitly allow for non-stationary variation in the oil price. This means that we can assess the effect of changes in oil prices that are not mean reverting in expectation. This is important, since the best forecast of oil prices in the future is often the level of oil prices today, indicating that non-stationary shocks account for a large share of oil price variation. Unlike what is common in macro models, we do not assume any particular level for the long-run oil price. Instead, we estimate a long-run relationship between oil prices, oil demand and aggregate real activity that pins down the long-run impulse-responses of real activity to oil prices. Not having to impose a univariate assumption about the long-run oil price is desirable since there is little to no theoretical or empirical guidance on any long-run oil price level.

Formation of inflation expectations - new insights from heterogeneity in a high-frequency survey
Gabriele Galati, Richhild Moessner

Using data from a weekly survey on inflation expectations for the euro area at different horizons, and information on the heterogeneity of survey participants from an additional questionnaire, this project analyses the formation and distribution of inflation expectations.

Price dispersion patterns in the European retail sector within and across the border
Marco Hoeberichts, Ad Stokman

The Nielsen grocery price dataset is unique dataset with approximately 3.5 million observations for the price, value and volume variables across a number of dimensions (13 European countries; 45 product categories; 70 regions; several store types, brands and package sizes). We use this dataset to analyse the dynamics of European price dispersion within and across countries. More specifically, we are interested in the cyclical behaviour of price dispersion and the extent to which this behaviour can be attributed to macroeconomic policies at the national level.

Price dispersion determination in EMU: Has Europe closed the gap with the US?
Marco Hoeberichts, Ad Stokman

In this paper, we use 50 years of price-level data to analyse the dynamics of price dispersion across countries of the euro area and across cities and region in the US. We find that in the pre-EMU period, European price dispersion is squeezed during economic downturns, whereas in the US and also in Europe during EMU, price dispersion is not different during recessions. This suggests that the establishment of EMU, with a common monetary policy and rules for fiscal policy in the member states, significantly changed the dynamics of price dispersion in Europe.

Effects of ECB balance sheet policies on inflation expectations
Richhild Moessner

In the wake of the global financial crisis the ECB has engaged in unconventional monetary policy measures which have led to a large increase in the size of its balance sheet. This project studies the effect of the ECB's balance sheet policy announcements on inflation expectations.

Does clear central bank communication on inflation reduce volatility in financial markets?
David-Jan Jansen, Ales Bulir (IMF), Martin Cihak (World Bank).

This paper studies the relationship between clarity of central bank communication about inflation and volatility in financial markets. Central banks have, over the recent decade, increasingly made use of communication. Few papers have so far studied to what extent the quality of central bank communication is relevant. This paper uses inflation reports and statements by various central banks to investigate the effect of textual clarity of communications on inflation outlook on volatility of bond markets and stock markets.

FDI and international business cycle synchronization: a structural analysis (project started in 2012)
Jos Jansen, Ad Stokman

Building on our earlier work, our paper aims to increase our understanding how deeper FDI relations may enhance business cycle co-movement, directly and indirectly. To this end, we plan to carry out an empirical analysis along the lines of Imbs (2004), exploring the structural relationships between FDI, international trade, financial integration, specialization and the similarity of economic structures and policies. The results of this project may serve as stepping-stones to the ultimate goal of including FDI into current macroeconomic structural models as a separate channel of international transmission (next to international trade and financial linkages).

Bad loans provisioning, credit supply and the real economy
Sebastiaan Pool (University of Groningen), Leo de Haan, Jan Jacobs (University of Groningen)

This paper examines how credit risk affects the real economy through the bank credit supply. Credit risk expectations are thereby measured by bad loan provisioning. Our sample consists of 12 countries and covers the period 1970Q1 till 2011Q2. We specify a theoretical model including the output gap, the inflation rate, the short-term interest rate, bank credit and bad loan provisioning. The paper's main interest is to determine the impact of bank provisioning on credit supply and the real economy. The model is estimated using a panel Vector Auto Regression to uncover the dynamic relationships that are common to all countries.

Monetary policy and inequality
Ayako Saiki, John Frost

The impact of monetary policy on distribution has been largely ignored in the literature. Against the backdrop of various unconventional policies taken by major central banks in recent years, their implications on income distributions require careful examination. This study aims to analyze the impact of recent unconventional monetary policies by major economies on income distributions, with a focus on Japan since the beginning of 2013.

How does the market respond to a government announcement?
Ayako Saiki, Jeffrey Frankel (Harvard University)

In this research, we explore market reactions to government announcements about growth, inflation, change in payroll employment, etc. For example, YoY growth vs. QoQ growth; YoY inflation and monthly inflation, etc. Our conjecture is that QoQ/MoM, as opposed to YoY, will contain more "noise," thus is likely to invite overshooting, or more simply put, higher volatility in the market.

The impact of the euro crisis on deposit rate convergence and pass-through
Saskia van Ewijk (TB), Ivo Arnold (Erasmus University/Nyenrode Business University)

Following the introduction of the euro, the pace of retail banking integration in the euro area has been slow. Since 2007, expectations of a gradual convergence in euro area retail interest rates have been thwarted by the credit crisis and the euro crisis. As a result, policymakers are increasingly concerned about financial fragmentation and the singleness of the monetary policy transmission. The present paper focuses on the savings market in the euro area. Recent events have had a strong impact on the ability of financial institutions to attract and retain deposit funding. Just when banks rediscovered the value of their deposit base, a combination of doubts about the soundness of banks and of the sovereigns supporting them may have increased the elasticity of the demand for deposits as households fled to safety. This paper tests in a number of ways for an effect of the euro crisis on deposit rate convergence and pass-through using the ECB's MFI interest rate statistics. We hypothesize that increased cross-country heterogeneity in sovereign and banking risk has led to greater rate dispersion, a disrupted process of convergence and a stronger interest rate pass-through in highly indebted countries.

2. Financial stability and macro-prudential supervision

Impact of innovation on retail payments pricing (project started in 2012)
Wilko Bolt, Heiko Schmiedel (ECB)

This project aims at analysing consequences of innovation in the retail payment landscape regarding pricing decisions, competition, and adoption of new electronic payments. An important question arises whether conventional balancing mechanism using interchange fees, e.g. card payments, will also apply to the emerging modern (online) and competitive payment space. Important aspects to be considered in such analysis may include: the use of interchange fees and surcharges, the role of public authorities, infrastructures and network effects, incentives, barriers of entry and competition, and effects on overall social welfare. Building on previous work by Bolt and Schmiedel (2011) and Bolt, Foote and Schmiedel (2011) on competition and efficient pricing in payment card markets, a novelty is that the paper allows for incorporating the impact of innovation and new technologies on payment prices, cost sharing, and distribution of benefits and overall economic welfare.

Financial globalization or global financial expansion? The impact of capital flows on credit and banking crises (project started in 2013)
Jon Frost, Ruben van Tilburg

Rising cross-border capital flows and the increasing size of national financial sectors are both a reality and a policy challenge. This project empirically examines the impact of capital flows on credit growth, credit excesses and banking crises in advanced (AEs) and emerging market economies (EMEs). We use panel data on a number of macroeconomic indicators, capital flows, domestic credit, "credit gap" (i.e. deviation of credit to GDP from a slow-moving trend) and banking crises (defined using Laeven and Valencia, 2012). Correlations confirm the finding that total gross inflows are associated with strong credit growth, and that especially portfolio and other flows are pro-cyclical, co-moving with GDP growth. Regressions look at the extent to which capital inflows and other factors precede credit growth and credit excesses. Going one step further, we look at the relative importance of capital flows and credit excesses for banking crises in a two-step regression. Decomposing credit gaps into components explained by domestic factors, capital flows and a residual allows us to study whether domestic or international drivers more frequently precede banking crises. The goal is to understand whether "financial globalization" or "global financialization", i.e. the build-up of excessive domestic (credit) intermediation in countries around the world, is a stronger indicator of bank crises.

A theory of bazookas, or "how to design large-scale official support" (project started in 2013)
Jon Frost

This project aims to develop a theoretical model for "big bazookas", a term coined by US Treasury Secretary Hank Paulson in the immediate pre-Lehman period. The intention behind such support funds is to provide so much available financing ("firepower") as to trigger a complementary market reaction, in turn reducing the probability that support will actually have to be used. At the same time, such support could be posited to have a number of other effects, including borrower and creditor moral hazard. Based on the post-crisis archetypes of official support, we construct a simple theoretical model of a deep-pocketed (sovereign or multilateral) creditor and distressed (private or sovereign) borrower. With a number of simple parameters, we attempt to formalize the conditions under which a "bazooka" will be credible enough to have the desired market effects. Among other things, we examine the size of official support funds compared to potential borrowing needs; the creditworthiness of (sovereign or multilateral) financiers; the conditions under which support is available; and the pricing of support. These parameters are assessed not only based on the (short-term) market reaction, but on the (longer-term) consequences for crisis prevention and moral hazard.

Real and financial cycles (project started in 2013)
Gabriele Galati, Irma Hindrayanto, Siem Jan Koopman (VU University)

The goal of this project is to examine the statistical properties of the financial cycle and its relationship with the business cycle. Our focus is on the following questions: To what extent can financial cycles be described by the behavior of credit and property prices? To what extent does the frequency of the financial cycle differ from that of the business cycle? Has it changed over time? And has the ratio of the two frequencies changed? Is the amplitude and length of the financial cycle regime-dependent? What is the match between peaks in financial cycles and financial crises? To address these questions, we plan to look at a panel of data on macroeconomic and financial variables for USA, Germany, France, Spain, Italy and The Netherlands over the past decades. Techniques such as the multivariate model-based Kalman filter provide useful econometric approaches to characterize the time-varying cyclical characteristics.

What do we know about the effects of macroprudential policy?
Gabriele Galati, Richhild Moessner

The literature on the effectiveness of macroprudential policy tools is still in its infancy and has so far provided only limited guidance for policy decisions. In recent years, however, increasing efforts have been made to fill this gap. In this project we review recent progress in research on the effectiveness of macroprudential instruments.

Financial crises and macroeconomic performance (project started in 2011)
Gabriele Galati, Chen Zhou

There is a need to improve analytical tools that allow us to make realistic assessments of risks in the financial system and their impact on the macro economy. An important aspect is to investigate empirical relationships between financial crises and macroeconomic performance. This research paper aims at verifying the existence of changes in the distribution of financial variables over time. In the extreme value literature, these changes can be classified into three categories: changes in shift, in scale or in shape. A change in *shift* would reflect the influence of time-varying factors. A change in *scale* could be interpreted as a change in underlying risk, to the extent that movements in explanatory factors translate into movements in the variance/scale of financial variables, which change the risk propositionally. Such a change may influence both the frequency and the magnitude of a crisis if one fixes the magnitude/frequency in the definition of a crisis. In the case of a change of the third type – in the *shape* parameter – the relation between magnitude and frequency of crises is affected. This research project aims at identifying the relative importance of possible changes of each type, and tries to relate their occurrence to structural changes in the properties of macroeconomic variables.

Central bank's influence in solving disruptions in RTGS: an experimental approach (project started in 2011)
Peter Heemeijer (University of Amsterdam and ABN AMRO), Ronald Heijmans

This paper builds on the experiment conducted by Abbink, Bosman, Heijmans and Van Winden (2010). Their paper conducts a laboratory experiment based on the game theoretical model by Bech and Garrat (2006). Their paper used disruptions to investigate how the dynamics of a game can change from a desired equilibrium to an inefficient one. Their paper excludes the influence of an authority like a central bank. This paper builds up on their paper and investigates three different ways of intervention of such an authority: 1) a positive intervention (or bail out) in case of undesired developments 2) a negative intervention (or punishment) in case of undesired developments and 3) providing information on "forced late payment". The experiment is conducted in a laboratory at CREED (UvA).

Effects of credit restrictions in the Netherlands and lessons for macroprudential policy
Jan Kakes, Gabriele Galati, Richhild Moessner

Macroprudential policy plays a key role in the current policy debate but the experience with macroprudential instruments goes far back in time. Some of the tools which are currently being used or proposed were originally used with microprudential objectives, while others were seen as monetary policy instruments to influence the supply of credit and growth. An example is the use of credit restrictions in the Netherlands from the 1960s to the 1990s. We plan to study the effects of the introduction (or tightening) and the lifting (or easing) of credit restrictions on credit growth in aggregate for all banks and financial institutions in the sample.

Sovereign-bank interdependencies: an empirical exploration
Krzysztof Muzalewski, Remco van der Molen, Jon Frost

Sovereign-bank feedback loops have been at the heart of the euro area crisis and many previous debt crises. This study sketches the direct and indirect channels of bank-to-sovereign and sovereign-to-bank stress, including through (expectations of) public sector support, bank holdings of sovereign debt, credit ratings and through the real economy. We measure the degree of interdependency using the correlation of sovereign and domestic bank CDS series for 24 countries over the 2006-2013 period. This measure is regressed on various indicators of interlinkages to empirically test which channels have been most important. We find evidence that especially direct sovereign debt holdings of banks have a significant impact, that the impact is larger when fundamental measures of sovereign and bank risk are higher, and that the importance of direct channels has increased since 2008. Similarly, we find that bank (sovereign) risk determinants perform better in explaining sovereign (bank) CDS levels when the correlations are high. From these results, we draw policy conclusions for banking regulation across the sample and for the design of the European Banking Union.

Financial sector development and external shocks in small open economies (project started in 2012)
Steven Poelhekke, Thorsten Beck (Cass Business School)

Sustained and stable real economic growth is most countries' ultimate goal. In theory, financial sector development should be able to smooth fluctuations. In practise, this is not always true. To what extent is the financial sector able to smooth shocks in small open economies, and what are the sector characteristics that constrain this function? What limits pro-cyclical lending by banks and credit booms in general? The paper will combine aggregate data with data on individual banks and firms and examine exogenous external shocks. In addition, the paper will examine the influence of the degree of competition and regulation in the banking sector and the political connectedness of firms.

Credit availability for Dutch homebuyers (project started in 2013)
Alex van de Minne (University of Amsterdam), Johan Verbruggen

It is widely perceived that credit supply conditions faced by Dutch home buyers have been liberalized in the nineties, with strong implications for credit availability and house prices. To understand the development of house prices in the Netherlands in the last decades, insight into credit availability to homebuyers is essential. However, long time series for credit availability and credit supply conditions in the Netherlands are lacking. This project in cooperation with the University of Amsterdam tries to fill in this gap, by constructing a Credit Conditions Index (CCI) and Financial Liberalization Index (FLIB), based on an earlier empirical analysis of the Bank of England. The outcomes might contribute to improve forecasting the Dutch house price development in general and the impact of institutional changes to house prices in particular.

Credit and liquidity risk pricing in interbank markets (project started in 2011)
Iman van Lelyveld

Banks are inherently fragile institutions making them susceptible to bank runs when liquidity issues emerge, even though the bank might be solvent. Further, banks operate in a network with other banks. The state of this network will influence bank's behaviour and vice versa. Taken together this would mean that market participants would be quite keen to price counterparty risks correctly. We want to study the pricing behaviour of Dutch banks observed in the interbank market. Such pricing information, gleaned from payments streams, would reveal something about banks' view on the riskiness of their counter parties and the risks surrounding scarce liquidity. This can then be compared to both public (credit spreads observed) and private information (collateral banks have available).

Understanding market behaviour is crucial for effective supervision and regulation. We would be able to contribute to the literature on risk assessment and price setting. A better understanding in this respect would allow us to develop (early) warning indicators of risks building up in the system. We use data from Heijmans *et al.* (2010). The algorithm developed links payments going out with a return stream consisting of the notional and the associated interest payment. We would then compare the private pricing information with publicly available risk measures and communication signals. Quoted bid-ask spreads (collected from Bloomberg) could, for instance, provide a 'public face' that could be compared with the private information contained in the bilateral prices.

Systemic risk and bank business models (project started in 2011)
Maarten van Oordt, Chen Zhou

In this paper, we plan to use the methodology from 'Systematic Risk under Extremely Adverse Market Conditions' in order to measure which banks are more sensitive to severe shocks in the banking system. Subsequently, we will try to find the bank characteristics that can explain and/or forecast this sensitivity. The analysis may provide a better understanding and forecasting ability on which banks are more sensitive to severe shocks in the banking system.

Identifying the determinants of competitiveness: A value added trade share perspective (project started in 2013)
Robert Vermeulen, Martin Schmitz (ECB)

This project investigates the country level determinants of the gains from trade. Countries have different positions in the global value chain. What ultimately determines the gains from trade is the value added a country adds to a product and not necessarily its export growth per se. Because the value added content of exports is not a reported number we calculate it from the OECD-WTO Trade in Value Added database to estimate the value added a country gains by trading for around 40 countries during 1995-2009. We empirically explain the change in the value added trade share by different (socio-)economic variables. These variables are based on previous literature explaining export growth. The outcomes can identify the important variables explaining value added trade growth. These can potentially provide policy makers with variables to target when aiming to improve the country's position in the value added chain. We also investigate the effect of FDI on value added trade growth. Do firms offshore the low of high value added part of the production chain? We explicitly document the policy implications that the results imply for the Netherlands.

Transmission of shock in capital flows and competiveness in selected European economies
Robert Vermeulen, Karsten Staehr (Eesti Pank)

The project aims to obtain insight into the economic links between capital flows, unit labour cost developments and the trade balance/current account. We are in particular interested in the time dimension and how a shock to one variable affects the other variables. The outcomes of this research project contribute to the debate on the competitiveness of peripheral euro area economies. In particular, we aim to obtain quantitative evidence on whether current account surpluses lead to a significant loss in competitiveness or competitiveness losses lead to current account deficits.

Price-based measures of systemic importance (project started in 2013)
Chen Zhou, Nikola Tarashev (BIS)

We use tools of extreme value theory to extract information about rare events from market prices. We find that such information contributes materially to measures of banks' systemic importance. We investigate the relation between these measures with simple characteristics of banks' balance sheets and income statements. In addition, we show the time variation on whether systemic important financial institutions are perceived as having low default risks.

3. Micro-prudential supervision and conduct of financial institutions

Dynamic adjustment of stock prices to the fundamental value: An error correction approach
Jaap Bikker, Laura Spierdijk (University of Groningen)

In the public discussion on the future of the Dutch pension system, people suggest that the current funding shortages will disappear as stock prices are expected to recover. Pension funds' investment policies in the Netherlands (including rebalancing strategies) are explicitly based on (long-run) mean reversion of stock prices. The existence or absence of mean reversion has great implications for the FTK continuity test and, the required buffers of pension funds. Theoretically, one may expect a strong link between the financial stock price and real-economic developments. Employing such kind of a long-run relationship is expected to result in a more informative mean reversion model. We will collect data series for several countries over very long periods. Furthermore, we will use bootstrap and simulation methods to determine reliable standard errors in models that employ overlapping samples. Finally, we will investigate the consequences of our results for the FTK continuity test.

Competition in the non-life insurance industry: a cross-country comparison
Jaap Bikker, Thomas Maas (University of Utrecht)

Competition in the non-life insurance markets is beneficial as long as the markets remain in equilibrium and the solvency of insurers is not impaired. Where many papers address insurer (in)efficiency, this paper contributes to the limited non-life insurance competition literature. Both the SCP paradigm and ES hypothesis use market concentration as a proxy for competition. This paper assesses competitive conduct in many countries by applying the Panzar-Rosse (P-R) model, adjusted for insurance markets. This approach is rare in the insurer industry and the P-R model is in most cases wrongly specified. Where existing papers on non-life insurance competition investigate a single country, we apply the ISIS data set of insurers' balance sheets across 36 countries. The sample covers around 35 thousand insurance-year observations on 3,500 individual insurers during the 1992-2012 period, allowing for a large cross country comparison.

Re-domestication of sovereign bonds asset holdings during the financial crisis: Evidence from Dutch financial institutions
Martijn Adriaan Boermans

Using a unique security-by-security transaction dataset we study monthly shifts in the positions of long term sovereign debt securities of the Dutch financial institutions during the period 2007-2012. This paper examines how different financial institution react to the global financial crisis of 2008 and the subsequent euro area crisis by moving their asset holdings away from foreign sovereign towards the home country. This research will be based on a granular dataset. A key advantage of granular data is that price and exchange rate effects can be traced.

Consumer loans: are they supplied competitively in the US?
Wilko Bolt, Dave Humphrey (Florida State University)

Bank loans generate more than half of all U.S. bank revenues and differ between business and consumer loans in both size and borrower sophistication. Consumers are viewed as less informed in financial matters and so are the focus of most state and federal legislation and regulatory concern. This is the first study to assess the competitiveness of the U.S. bank consumer loan market by comparing results from four different competition measures: HHI, Lerner Index, H-Statistic, and a new one based on frontier analysis. What is the best measure? Using what appears to be the best indicator based on consumer loan price conduct and profit performance, we will analyse the characteristics of the most and least competitive banks and try drawing policy recommendations regarding market structure. Our competition measure borrows from the cost/profit efficient frontier literature and is applied to US banks to assess consumer loan competition between larger versus smaller banks, and to determine whether competition has changed over time.

Regular equivalence in interbank markets (project started in 2012)
Wilko Bolt, Rod Garratt (University of California Santa Barbara), Iman van Lelyveld

Identifying classes of institutions that respond in a similar way to shocks or policy changes is of key interest. Two institutions that perform a very similar function in a financial system, and hence should be regard as similar by a regulator, may not be connected at all. In fact, it is precisely this functional similarity that might preclude their interaction with each other. In a strong notion of equivalence, nodes in a network need to be connected to the same neighbouring nodes. We consider a less restrictive notion of equivalence called regular equivalence. Regularly equivalent nodes do not necessarily have the same neighbours, but their neighbours must be regularly equivalent. So, institutions are grouped together if they interact with other institutions that perform the same function. They do not have to interact with the same institutions. We intend to apply the notion of regular equivalence to the unsecured interbank money market using TARGET data. Our first task will be to compare the portioning of banks generated by regular equivalence to that obtained a connectionist approach. We will then examine whether our structural classification can be used to predict responses to shocks or policy changes. The classification could be useful for justifying differential regulation of subsets of banks.

Preferential treatment and trading: A detailed analysis of government bonds
Clemens Bonner

Using transaction level data of Dutch banks' buying and selling of government bonds, I plan to analyse the fundamental factors driving banks' supply and demand of government bonds. More specifically, the main purpose of this paper is to show whether Dutch banks' liquidity and capital position explain their demand for government bonds. To empirically analyse the impact of Dutch banks' regulatory capital and liquidity position on their demand and supply of government bonds, I combine the transaction-level MIFID data with information from DNB's prudential capital and liquidity reporting. The dependent variable is therefore banks' buying and selling volumes, while the key explanatory variables are banks' capital and liquidity ratios, which I will estimate with Seemingly Unrelated Regressions. To distinguish general risk management effects from regulatory effects, I plan to specifically analyse banks' behaviour during the last few days before reporting.

A cost analysis of pension fund investment portfolios
Dirk Broeders, Arco van Oord, David Rijsbergen

Little is known about the structure of investment costs for pension funds. The main contribution of this paper is to employ an exclusive pension fund database to provide a comprehensive overview of the investment costs by Dutch pension funds for 2012 and 2013. The database covers unique data for approximately 200 pension funds and is highly detailed. For one, the database provides the costs per pension fund for 6 different asset classes (*i.e.* equity, fixed income, real estate, commodities, private equity and hedge funds). Moreover, we are able to differentiate between asset management costs, transaction costs and performance fees. As pension funds play a critical role in many people's overall life cycle saving and investing, assessing performance and cost structures is essential.

Interbank lending behaviour under stress and the role of the central bank (project started in 2012)
Leo de Haan, Ronald Heijmans, Richard Heuver, Jan Willem van den End

Heijmans and Heuver (2011) show how daily TARGET2 transaction and collateral data can be used to generate graphic representations of individual banks' behaviour in the Dutch part of the (unsecured) interbank money market. Lending to and borrowing from other banks, borrowing from and depositing at the central bank, the use and build-up of collateral, and payment delays may indicate that a particular bank is in distress. As a follow-up to that exploratory paper, we look for early warning indicators of liquidity stress for individual Dutch banks using both TARGET2 transactions data and liquidity supervisory data from DNB. We employ Receiver Operating Characteristics (ROC) to evaluate the signalling quality of the potential indicators.

Bank lending in the wake of funding liquidity shocks: Micro evidence of Euro area banks
Leo de Haan, Jan Willem van den End, Philip Vermeulen (ECB)

We examine banks' responses to funding liquidity shocks, using data of more than 200 banks in the euro area over the period August 2007 to June 2013. A panel VAR framework is used to simulate banks' adjustments of loan volumes and lending rates in response to funding liquidity shocks. We simulate how banks respond to shocks in corporate and household deposits, securities issued and interbank deposits and thereby distinguish between banks in stressed and non-stressed euro area countries and between banks with low and high capital ratios, and with high and low loan-to-deposit ratios, respectively. We further test whether central bank facilities have mitigated these responses.

Pension underfunding and recovery plans: what drives pension funds away from their original recovery plan and how do they expect to get back on track again?
Leo de Haan

Since the 2008 stock market crash, about 300 Dutch pension funds got underfunded and therefore had to submit a recovery plan to the regulator. Since then, these funds also had to submit annual progress reports evaluating their recovery. Using these micro data, this study examines (1) what fund-specific characteristics make some pension funds deviate more from their original recovery plans than others, and (2) how does this affect the measures taken to get back on track again. Both the funding ratio and its drivers (i.e., premiums, rate of return, benefits, interest rate, indexation, other) are distinguished.

The effects of stress tests on equity prices, CDS spreads, and betas
Ekaterina Neretina (Duisenberg School of Finance), Cenkhan Sahin, Jakob de Haan

We investigate the effects of the announcement and the disclosure of the clarification, methodology, and outcomes of the US banking stress tests on banks' equity prices, credit risk, systematic risk, and systemic risk during the 2009--13 period. We find only weak evidence that stress tests after 2009 affected equity returns of large US banks. In contrast, CDS spreads declined in response to the disclosure of stress test results. We also find that bank systematic risk, as measured by betas, declined in some years after the publication of stress test results. Our evidence suggests that stress tests affect systemic risk.

Top management dilemmas: how accountability influences a focus on collective goals (project started in 2013)
Melanie de Waal

In response to the financial crisis a behavioural and cultural change starting at the *top* of financial organisations (i.e. at the board-level) is desired, which concerns a shift from short-term individual goals towards a focus on collective goals that serve financial organisations in the long run. To realize this change a call for more regulation on the financial sector is heard and to subsequently decrease risk taking behaviour at the top of financial organisations. This research project aims to investigate which factors play a role in stimulating this focus on organizational goals. Important in this regard are the dilemmas that top managers in financial organisations encounter when they have to choose between divisional goals these board members represent and the collective goals of the organisation. In such social dilemma situations accountability is seen as a silver bullet that can stimulate employees and teams to focus on the achievement of long-term collective goals, rather than on short-term individual gains. It is assumed that this focus will also reduce risk-taking behaviour of organisations. In 2012 a first study was performed to investigate this influence of accountability and specifically the accountability audience in relation to a focus on organizational goals. In 2013 a follow-up study will be prepared and conducted to further study this topic.

The effectiveness of internal and external accountability: two field studies
Melanie de Waal

Accountability refers to the degree to which a person feels he or she has to justify one's actions (Frink, Klimoski & Ferris, 1998). In previous research we studied whether it matters to *whom* people are held accountable for their actions - to their direct social work environment or to an external institution (i.e.

respectively an internal or external accountability audience; Ferris et al, 1995). We found a stronger influence of internal accountability than external accountability. This influence of internal accountability can partly be explained by higher perceived reward and referent power of this internal accountability body. In two new research projects we build on these findings to study the influence and effectiveness of both forms of accountability in the field. Research questions for both forms are: when is this type of accountability effective? And on what grounds is this influence based. Further we are interested in the working of both accountability types in conjunction. We will study these research questions among compliance officers and other internal supervisors as well as from an external supervisory perspective. Data for these two research projects will be collected in 2014.

Monitoring the interbank market through dynamic network visualizations of transactions
Ronald Heijmans, Richard Heuver, Clement Levallois (Erasmus University) and Iman van Lelyveld (BIS)

This study describes the principle of "data visualization" and how it can contribute to the effective monitoring of financial markets. Data visualization refers to a set of tools and practices to visualize datasets, at the most disaggregated level, in an interactive and exploratory way. We demonstrate a workflow for data visualization in finance, based on the example of the full set of transactions on the Dutch interbank market over 2008-2012. We detail the series of computational and conceptual steps leading to picturing these transactional data as a network of interconnected banks evolving through time. We show that the spatial reconfiguration of this network as it evolves generates important insights regarding the shifting role of the central bank in relation to the banks active on the market over the period.

Towards more realistic simulations
Ronald Heijmans, Richard Heuver

This paper aims to improve the performance of simulations with the Bank of Finland simulator using historical data. The current problem with the BoF simulator is that using historical data of TARGET2 is very time consuming in terms of computing time. Especially when simulations are to be done with TARGET2 data, which have roughly 350,000 a day. Therefore it is currently difficult to impossible to perform simulations containing several days of TARGET2 transaction data. A lot of the transactions are however of low value (below EUR 100,000). The approach proposed in this paper is to aggregate the relatively low value payments (e.g. below EUR 10,000 or EUR 100,000) from a participant to another participant in TARGET2 for e.g. 15 minutes. This paper has to define what the level of aggregation can be in terms of aggregating time and individual transaction value. It is the expectation that more than 50% of the individual transaction can be aggregated without changing the outcome of a simulation significantly. We use the BoF simulator in the TARGET2 simulator environment. TARGET2 data from the simulator platform is used to perform the simulations.

Determinants of bank stability throughout the 2007 – 2011 financial crisis (project started in 2012)
Mark Mink, Jakob de Haan

Demirgüc-Kunt et al. (2010) show that banks which entered the crisis with higher regulatory capital ratios turned out to be more stable and resilient to shocks, consistent with the objective of capital regulation. These regulatory capital ratios have remained remarkably stable throughout the crisis, and in many cases have even increased. This observation is at odds with market participants' perceptions of bank capital levels, which have worsened substantially as evidenced by the fact that bank stock prices have plummeted. As a result, the question arises to what extent market participants take into account banks' regulatory capital levels when evaluating their stability, and to what extent they attach value to other factors such as expectations of future profitability and the presence of (implicit) government safety nets. Our approach to analyse the determinants of bank stability is inspired by the regression framework by Stiroh (2006). In this framework, we can take into account variables reflecting regulatory capital ratios, the stance of the business cycle, and bank characteristics that are associated with the likelihood of receiving a bailout (such as size). By analysing the difference between the coefficients and the changes in coefficients over time, we can draw conclusions about the (potentially time-varying) importance of the various determinants of bank stability.

Suppliers to multinationals and local and global crises (project started in 2012)
Steven Poelhekke, Beata Javorcik (University of Oxford)

During the Asian financial crisis of the late 1990s, it was a good thing for a local firm to be (partially) foreign owned or an exporter, since global demand remained strong (especially after devaluation) and these firms were less dependent on the locally failing banking system. Also suppliers to multinationals tend be less capital constrained. Export status or foreign owned status during a global crisis may, however, be less of a good thing due to weak global demand and (real and financial) contagion effects. How did suppliers to multinational cope with the recent crisis? To what extent can (parent) MNEs substitute for banks?

Do banks lend to countries with overvalued currencies?
Ayako Saiki, Dennis Quinn (Georgetown University)

Using a proprietary BIS bank lending survey, we examine whether or not advanced economies' bank lending tend to go to EMEs where currencies are overvalued vis-à-vis the lending country (as undervalued countries typically do not have to borrow), which can eventually lead to a financial crisis of the recipient country. We also examine if/how banks' borrowing behaviour changed after crisis episodes.

The role of a private trade credit insurer in the international transmission of shocks (project started in 2013)
Koen J.M. van der Veer

The role of trade finance, credit or insurance, in the decline of trade during crises has received much research attention since the global financial crisis and collapse of international trade in 2008-09. There is now convincing evidence that banks transmit financial shocks to exporters via a reduction in trade finance (Amiti and Weinstein, 2011). While banks are the principal suppliers of trade finance, a focus on banks exclusively could give an incomplete picture of trade finance constraints during a crisis. This paper assesses the role of private trade credit insurers during crises by being the first to examine empirically how a globally active private trade credit insurer reacts to loss shocks. I show that the private trade credit insurer transmits shocks across countries by reducing its supply of export credit insurance. This finding is particularly relevant for an export-oriented country such as The Netherlands. Moreover, DNB supervises Atradius; one of the "Big Three" private trade credit insurers with a combined share of 85% of the world market for private trade credit insurance.

Impact of the global financial crisis on banking systems across the world
Neeltje van Horen, Stijn Claessens (IMF)

Using the updated version of the Claessens and Van Horen database on bank ownership, this paper examines how the global financial crisis has affected banking systems across the world. The paper aims to provide insights in whether financial crises lead to consolidation of the banking system or not, how foreign bank ownership changes during the cycle and what type of banks were able to profiting from the crisis. The large number of banks and countries covered in the database (over 5000 banks active in 135 countries) and the long time series of the data (covering 1995-2013) provides for a unique insight in how banking systems adapt in the wake of a severe financial crisis.

When Arm's Length is Too Far. Relationship Lending over the Business Cycle (project started in 2013)
Neeltje van Horen, Thorsten Beck (Cass Business School), Hans Degryse (University of Leuven), Ralph De Haas (EBRD)

Building on the theoretical model of Bolton, Freixas, Gambacorta and Mistrulli (2013) this paper examines how the presence of relationship banks in the vicinity of a firm affects the ability of local firms, in particular small and medium-sized ones (SMEs), to access external finance in times of stress.

To do so we collected new data on the exact geographical location of banks' branch networks in 22 Eastern and Central European countries. Moreover, we measure how these branch networks develop over time through openings and closures, as well as mergers and acquisitions. This gives us a very detailed and rich picture of the dynamics of bank branch networks for domestic and foreign banks across and, importantly, within countries. Using a new survey on bank environment and performance conducted by the EBRD (BEPS) we identify banks that mainly conduct business through building relationships with their clients and banks that are mainly involved in transaction based lending. We merge these data with information on firms' access to finance in 2005 and 2008, taken from the Business Environment and Enterprise Performance (BEEPS) survey. Using this unique micro-level database, we first examine whether the presence of branches of relationship banks in a firm's vicinity affects access to finance during boom years and during crises years. Next we investigate which types of firms benefit more and whether country characteristics, like the availability of a credit registry and the strength of the legal system, matter.

Securitization and insolvency risk
Maarten van Oordt

Does the removal of credit risk from banks' balance sheets through securitization transactions reduce the insolvency risk of financial institutions? This is an important question in the context of current plans to implement regulation on credit risk retention and the development of plans to set up a Dutch mortgage institute (NHI). The purpose of this project is to study this issue in the setting of a theoretical framework.

It takes two to tango: Do external supervisors form cognitive and affective bonds with the institutions they monitor and should we care?
Dennis Veltrop, Jakob de Haan

While prior research has indicated that social identification with the financial sector is an important determinant of regulatory capture, we know very little about the determinants and consequences of external supervisors' cognitive and affective bonds with the institutions they monitor. In this research project we propose that cognitive and affective bonds have a fundamentally different impact on supervisor effectiveness and that these bonds form from a complex interplay between the characteristics of the supervisors and the supervised financial institutions.

I'm not talking to you: financial consequences of different conflict management strategies in Dutch pension fund boards
Dennis Veltrop, Jakob de Haan, Niels Hermes (University of Groningen)

Dutch pension fund boards are inherently factional. While a great deal of group research suggests that effective conflict management strategies are crucial for the effective functioning of teams, the dynamics of different conflict management strategies within factional groups (such as pension fund boards) is yet to be explored. Drawing from a large-scale study in which pension fund board members provided information on the different conflict management strategies being employed within their boards, we investigate the optimal conflict management strategies for curbing underperforming pension fund performance.

Board functioning: A multilevel perspective on the determinants of effective board behaviour in financial institutions (project started in 2012)
Dennis Veltrop, Jakob de Haan, Gerben van der Vegt (University of Groningen)

Boards of directors are critical for good governance of financial institutions. Although a great deal of research has been conducted on formal structural board arrangements, like any social entity boards of directors are first and foremost social groups. Governance scholars know very little about the determinants of effective board behaviour, however. This research project teases out the determinants of effective board behaviour at multiple levels of analysis. We study board behaviour at the group level of analysis, at the individual level of analysis, and at the dyadic level of analysis. Thereby, facilitating a fine-grained analysis fostering a profound understanding of boards from a behavioural perspective.

Is there a home bias in Dutch insurance companies' asset allocations? (project started in 2012)
Robert Vermeulen, Melle Bijlsma

Previous research pays little attention to the international diversification of insurers' assets. In general, researchers take home bias as a given for insurance companies. There are, in principle, no barriers to foreign investments for Dutch insurance companies. Moreover, the euro zone provides a large market to hold assets the same currency. Since knowledge about insurance companies' investments is scarce, we first document Dutch insurers' geographical asset mix. We use confidential DNB data at the firm level, which contains the investment positions and transactions for each Dutch insurance company during 2006-2011 at the quarterly frequency. A first glance at the data suggests that most funds are invested in euro denominated assets, mostly bonds. We formally study the extent of home bias in the portfolio with an empirical gravity model. In particular, we study whether gravity matters differently for the type of asset and how it changes from pre-crisis, during the financial crisis and during the current sovereign debt crisis. We aim to document the extent to which insurers decrease their exposure to periphery government debt and to where they shift their portfolios, in particular whether the sovereign debt crisis creates a flight to domestic assets and increases the home bias.

Loan loss reserve announcements: Investor responses during the financial crisis (project started in 2013)
Robert Vermeulen, Theoharry Grammatikos (Luxembourg School of Finance)

Since the outbreak of the sub-prime mortgage crisis banks had to write off large amounts of bad debts. Banks first make an estimate of the amount of loan that will likely not be repaid. This is the allowance for bad debts. Loan loss reserve (LLR) additions precede loan losses. These LLR additions are an important part of every quarterly earnings announcement, because they contain important information about the management's view on future credit losses. However, it is ex ante not clear how investors should react to LLR additions. Theoretically, many different channels are at work. LLR additions signal that loans will not be repaid, which is a value loss. But LLR additions can also signal that banks are not willing to refinance non-creditworthy customers. Also, when loans are written off, this induces tax savings for banks. This paper investigates if LLR announcements and actual loan losses trigger an abnormal stock price reaction during the 2006-2011 period and if so in which direction?

Funding Preferences of Acquired Non-Financial Firms
Razvan Vlahu, Steven Poelhekke

This empirical study investigates the impact of foreign acquisitions on funding preferences of acquired non-financial Dutch companies. Put in different words, we try to assess whether non-financial Dutch companies who rely on funding from Dutch banks in a pre-acquisition period, change (completely/partially) their borrowing counterparty upon being acquired by a foreign entity. Do such firms rely on Dutch (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? The latter may have become more likely now that Dutch firms have reduced their international scope by closing or selling foreign offices (notably ABN AMRO). Can we identify firm characteristics that predict this change? Did this change affect firm performance in any way? 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. The paper adds to the literature on the costs and benefits of global banking, openness of the banking sector, cross-border contagion and stability, and relationship banking.

Understanding the effects of qualitative supervision policies.
Aloys Wijngaards, David-Jan Jansen

It is becoming increasingly important to understand the effects of financial supervision (Hilbers et al. 2013). Measuring the effects of financial supervision helps supervisors in understanding which interventions provide the best results and enables them to give an account of their supervisory activities. This holds for all dimensions of supervision, but it is especially relevant for relatively new developments that have a strong qualitative component. This project focuses on supervisory policies with a strong qualitative component, such as, for instance fit-and-proper testing and remuneration.

4. Financial literacy and behaviour of households and companies

Consumer Cash Usage and Management: A Cross-Country Comparison with Diary Survey Data (project started in 2013)
John Bagnall (RBA), David Bounie (Telecom Paris Tech), Kim P. Huynh (BoC), Anneke Kosse, Tobias Schmidt (Buba), Scott Schuh (Fed Boston), Helmut Stix (OENB)

The aim of this paper is to measure consumers' use of cash by employing microeconomic evidence from payment diaries from seven countries. The data are collected from large-scale payment diary surveys conducted in Australia, Austria, Canada, France, Germany, the Netherlands and the United States. A unique feature of this data is the availability of rich information on individual payments over a fixed number of days paired with information on individual consumers for seven countries. We use these data to shed light on two issues: (i) To what extent is cash used in the seven economies? (ii) The use of micro data allows us to uncover who uses cash, for which purchases and at which locations. This helps in assessing whether cash use, for example, will gradually disappear or whether cash can sustain its role as a payment instrument. Similarly, we study whether cash is used only for certain transactions or for certain spending amounts (such as low-value transactions). The results will foster our understanding of how consumers choose among different payment instruments and how they manage their cash balances.

Housing price shocks and trust in financial advice
Dimitris Georgorakos (Goethe University Frankfurt), Roman Inderst (Goethe University Frankfurt), Maarten van Rooij)

In the last decade, housing prices have fluctuated significantly in the Netherlands. In particular, housing prices increased dramatically between the early 2000s and mid 2008, while they have subsequently dropped by 20% on average. At the same time, almost one out of three Dutch households has taken out a mortgage loan in the period 2000-2008, the vast majority of whom after receiving financial advice. Part of the households report that they were advised to take up particular mortgage products (such as interest only mortgages) or to borrow higher than planned amounts. Against this background, our aim is to examine the extent to which the likely losses that households have experienced on a difficult-to-trade asset have influenced the trust they put in advice and in financial institutions and banks more generally.

Cash management and intraday cash balances
Lola Hernandez

Payment instruments play a key role in channelling consumers' money into the economic pipeline. Increasing the efficiency of the payment system is then a crucial task of central banks. To better understand what determines the role of payment instruments, it is fundamental to study what determines their use at different moments. This paper aims at better understanding this by shedding light on consumers' cash management while incorporating detailed information on cash balances and withdrawals. The focus of this paper will be on cash management and tracking people's payments, using detailed information on their cash balances and transaction characteristics, such as their order and size. In order to do this, it will use shopping diary data collected in an extensive payment survey in 2013 among more than 8,000 Dutch consumers.

Cash versus debit card: the role of budget control (project started in 2012)
Lola Hernandez, Nicole Jonker, Anneke Kosse

Given the current financial crisis and the new opportunities offered by the various innovations in retail payments, the question arises to what extent these new ways of paying as well as cash help consumers to gain insight into their budgets and expenditures. Another related question is whether consumers' desire to control budgets affects their payment choice. However, as far as we know the economic literature has spent little attention to these subjects. Therefore, the aim of this paper is to fill this gap, by studying consumers' needs for controlling their expenses and budgets in relation to their choices between payment instruments at the point-of-sale (POS). We focus on the role of cash and the debit card, as they are by far the most frequently used means of payment in the Netherlands. Based on a first data collection round in 2011 using a payment survey on the general budgeting behaviour of Dutch consumers, we drew up and distributed a second questionnaire among more than 1,700 Dutch consumers in 2012 to collect unique and detailed information about their needs for and views on monitoring and controlling budgets and expenses. In addition, we collected data on the characteristics of the respondents using an additional survey that was distributed amongst the same group of consumers in the same year. This rich dataset allows us to assess differences across individuals. In particular, in this paper we aim at answering the main research questions while focusing on differences based on consumers' financial situation and their degree of self-control in financial matters.

The impact of public campaigns on debit card usage in the Netherlands (project started in 2012)
Nicole Jonker, Mirjam Plooij

This paper aims at assessing the overall effectiveness of campaigns to stimulate debit card usage, as well as the effectiveness of the different kind of actions. In 2013 we collected monthly/weekly branch specific debit card figures as well as information on the intensity of the different kind of actions. We will use time-series/panel data techniques to analyse whether the actions have had effect on card usage, while controlling for other factors which influence card usage such as demand side factors (demographics, macro-economic environment) and seasonal effects. Research questions we want to answer include: has the campaign stimulated card usage, if yes to what extent? What kind of action has the largest impact? Does the campaign alter payment behaviour permanently or temporary? With respect to regional-specific promotions: did the campaign only affect card usage in that specific region or were there any spill-over effects to other regions nearby as well?

Where are the retirement savings of self-employed? An analysis of unconventional retirement accounts
Mauro Mastrogiacomo, Rob Alessie (University of Groningen)

Survey data show that many respondents save for retirement in unconventional retirement accounts, such as investments in real estate. Many self-employed also report this as an argument against making retirement savings compulsory. We use a confirmatory factor analysis to study the relation between the importance of a broad spectrum of saving motives, such as saving for retirement, and saving behavior. We show that finding the retirement motive important does not directly translate in additional retirement savings, both for self-employed and employees. The (median) annuity stream generated by conventional and unconventional accounts from age 67 is small; most savings are residual and are not being put aside for a specific motive. Self-employed retirement savings are low, even though this group has generally no occupational pension.

The retirement preparation of self-employed: an investigation of their wealth holdings and their choices
Mauro Mastrogiacomo, Yue Li (VU University), Stefan Hochguertel (VU University), Hans Bloemen (VU University)

In this study we aim to investigate whether there is a causal relation between wealth and self-employment. Descriptive evidence suggests that self-employed will approach retirement with substantial wealth holdings. But is this due to the fact that, thanks to self-employment, these individuals have earned/saved more? Or is it the case that a selection effect takes place wherefore richer individuals are more likely to become self-employed? And if any of these effects is found, does this differ by cohort? In the Netherlands this is particularly relevant because self-employed may need to compensate the lack of a second pillar pension. Also in other countries, such as Italy and the UK, most self-employed do not contribute in a second pillar pension scheme. Also in these countries wealth appreciation, in the form for instance of rising stock prices and house prices, have strongly affected the wealth holdings of the middle aged, but it is questionable whether such capital gains will be realized again in the future by current generations of younger self-employed. But cohort differential may actually not only be accidental but linked to the consideration above and at the same time testify of a changing perspective towards self-employment. It is possible that in the past only rich people could afford starting up a firm, because for instance of borrowing constraints and higher start-up costs. With the increasing financial liberalization and the reduction of start-up costs due to technological progress, starting up a (solo) firm has become more accessible for younger generations. So the aim of this paper is twofold: understand how the causality between self-employment and wealth works, and whether this differs by cohort.

Macroeconomic effects of mortgage interest deduction. How does a fall in the mortgage interest deduction influence the rate of mortgage default? (project started in 2013)
Cenkhan Sahin

How does a fall in the mortgage interest deduction influence the rate of mortgage default? In this paper I study a business cycle model where households invest in mortgages featuring tax-deductible mortgage interest. I analyze how shocks affect the rate of default on mortgages and the subsequent transmission to the rest of the economy. The findings indicate that an economy with a higher mortgage interest deduction is characterized by higher house prices, more levered households, and a higher rate of mortgage default.

Household wealth, indebtedness and consumption behaviour in the Netherlands: Empirical evidence from survey data (project started in 2013)
Federica Teppa

The paper investigates the dynamics of household wealth and indebtedness over the recent years in the Netherlands. The empirical analysis is based on survey data from the DNB Household Survey (DHS), and from the Household Finance and Consumption Survey (HFCS). The longitudinal component of the DHS allows to study whether the recent financial crisis has had a significantly negative impact on the level of household indebtedness in a country (the Netherlands) that suffered relatively less from labour market shocks than other European countries during the crisis period. The use of the HFCS, a new harmonized dataset collecting detailed information on wealth holdings, consumption and income in the 15 Euro countries, allows to adopt an international perspective and to compare the indebtedness level of Dutch households with that of other European countries. Preliminary results already show that Dutch households are the most indebted ones in Europe, mainly as a consequence of the very developed mortgage market and of the fiscal incentives related to that. The analysis focuses on how the level of household wealth and debt vary with background characteristics, occupational status and income distribution, and on how the propensity to consume vary across the wealth distribution. Ultimately the paper will detect vulnerable segments of the population whose high level of indebtedness makes them particularly exposed to unexpected idiosyncratic risks in the economy.

Household saving behaviour and credit constraints in the Euro area (project started in 2013)
Federica Teppa, Alessandro Porpiglia (BdL), Michael Ziegelmeier (BdL), Julia Le Blanc (Bundesbank), Jose Maria Casado (BdE), Junyi Zhu (Bundesbank), Elena Pavlova (ECB)

We study the role of individual motives for saving and that of perceived liquidity constraints on household finances in the 15 Euro-area countries. The empirical analysis is based on the Household Finance and Consumption Survey (HFCS), a new harmonized dataset collecting detailed information on wealth holdings, consumption and income. We find evidence of heterogeneity across countries with respect to saving preferences and the relative importance of alternative motives for saving. In addition we find a more homogeneous impact of credit constraints that are perceived to be binding for specific groups of respondents. These findings have relevant policy implications if interpreted in light of the recent financial crisis, the country-specific institutional settings, and the different degree of development of formal lending channels.

The rose-colored glasses of homeowners (project started in 2013)
Carin van der Cruijsen, Maarten van Rooij, David-Jan Jansen

We show that homeowners have a rosy picture of the past, current and future value of their homes, using an annual survey among Dutch households. Optimism is driven by both loss aversion and the endowment effect; overestimation of the home value is positively related to the loan-to-value ratio and tenure of the owner-occupier. Furthermore, overestimation is related to individual-specific and house-specific characteristics, such as age and house size. When house price declines continue, homeowners' estimates become more realistic.

5. Modelling and forecasting

Interaction of trend-season-cycle components (project started in 2013)
Irma Hindrayanto, Jan Jacobs (University of Groningen), Denise Osborne (University of Manchester)
State space models that allow for trend, cycle and seasonal typically assume that an observed series can be decomposed into a trend, a cycle, and a seasonal component where the three unobserved components are assumed uncorrelated. We propose an alternative specification by allowing for correlated shocks in the state equation. In the specific context of seasonal-cycle interaction, we assume that cycle shocks may have an impact on the season, or the other way round that seasonal shocks have an effect on the cycle. The modelling of seasonal-cycle interactions has direct implications for seasonal adjustment of a series, and thus the understanding of the business cycle situation in real time.

An integrated model for tracking the business cycle and GDP growth in the Netherlands
Irma Hindrayanto, Siem Jan Koopman (VU University), Jasper de Winter

The artikel of Azevedo, Koopman and Rua (AKR, 2006, JBES article) proposed a multivariate bandpass filter based on the trend-cycle decomposition model for the Euro-area. The underlying multivariate dynamic factor model with a moderate database (of nine time series) relies on specific formulations for trend and cycle components and produces smooth business cycle indicators with bandpass filter properties. The advantage of this method is that it provides additional information about business cycle, such as the phase shift for individual time series, and it computes a growth indicator as a by product at the same time. In this project, we plan to modify the AKR method by including relevant financial variables (financial-macro relation) and trying different trending order to improve the construction of AKR's business cycle indicator. The ultimate goal of this project is to produce a midterm forecast (1 year) with a story-telling ability. Where does the growth come from, which variables can be accounted for, where are we in the business cycle phase?

Improving short-run predictions of GDP by statistical methods by subjective information (project started in 2013)
Jos Jansen, Jasper de Winter

This project investigates how short-run forecasts of real GDP derived from statistical procedures may be improved by subjective forecasts by financial analysts in real time. A reliable assessment of the current state of the economy and its prospects in the short run is of great importance to both policy makers and private agents, especially in volatile times. The project builds upon the results of a pseudo-real time analysis by Jansen, Jin and de Winter (2012) who found that predictions by financial analysts are rather poor forecasting devices in themselves, but do seem to contain valuable information that statistical models fail to pick up. We will use a dynamic factor model as a purely mechanical forecasting device to extract the predictive information from a large dataset of monthly indicators, such as industrial production and consumer and producer confidence. We then try to enhance model-based forecasts by forecasts by financial analysts, which are partly determined by 'judgment'. We follow a strictly real time setup, using only available information, including preliminary figures and revisions on GDP and industrial production data. The analysis will cover six European countries, the euro area and the US.

Optimal forecasts in the presence of structural breaks for nonlinear forecasting problems (project started in 2013)
Andreas Pick

In this research project we will extend the optimal weights that Pesaran, Pick and Pranovich (2012) derived for the linear regression model under structural breaks to a range of nonlinear forecasting problems. In this research project, we aim at generalizing the weights to other models and to forecasting problems other than point forecasts. The underlying methodology will remain the same: each observation is weighted in the forecasting procedure, where the weights have no restriction other than summing to one over the sample. A loss function is specified, for example the mean square forecast error but others will be considered, too, and the weights are found by minimizing the loss function. Given the generality of this approach, the resulting forecast will be optimal under a wide range of assumptions. For example, forecasts that use only observations after a structural break and other weighting approaches such as exponential smoothing are special cases of our general forecasting procedure.

Forecasting with Markov switching models
Andreas Pick

This research considers forecasts from Markov switching models that are optimal in the mean square forecast error sense. We derive optimal forecasts conditional on the states and unconditional on the states of the Markov chain. The forecasts have different characteristics, showing that it is important to take the uncertainty surrounding the states into account. The performance of the optimal forecasts is shown through simulations. In an empirical example on monthly U.S. foreign exchange rates, we find that the Markov Switching model consistently outperforms a random walk specification.